James M. Goldfarb
Editor

Third-Party Reproduction

A Comprehensive Guide

Springer

Third-Party Reproduction

James M. Goldfarb
Editor

Third-Party Reproduction

A Comprehensive Guide

Springer

Editor
James M. Goldfarb, M.D., M.B.A.
Fertility Services and In Vitro Fertilization
University Hospitals of Cleveland
Cleveland, OH, USA

Clinical Professor of Reproductive Biology
Case Western Reserve University
Cleveland, OH, USA

ISBN 978-1-4614-7168-4 ISBN 978-1-4614-7169-1 (eBook)
DOI 10.1007/978-1-4614-7169-1
Springer New York Heidelberg Dordrecht London

Library of Congress Control Number: 2013940061

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

To my family, who has been so supportive throughout my career, and to my patients and coworkers, who make me look forward to coming to work everyday.

Preface

Third-party reproduction includes any process in which a person other than the one(s) desiring to have a family provides sperm or eggs or use of a uterus so that another person or couple can have a child. For many years, third-party reproduction was limited to the use of donor sperm and was not done openly. The first use of sperm donation is thought to have occurred in 1884, but it was done without the wife's knowledge and it was not reported in a journal until 25 years later. As late as 1954 the Supreme Court of Cook County stated that even if the husband consented to the donor insemination, it was considered adultery and the child was illegitimate. It was not until 1964 that the first state, Georgia, passed a law recognizing children born from donor insemination as long as written consent was obtained from the husband and wife.

The use of donor insemination increased greatly in the 1960s, and the first commercial sperm bank opened in 1971. However, it was not until the introduction of in vitro fertilization (IVF) and its resulting expansion of third-party reproduction options that third-party reproduction began to attract significant attention. The first IVF-conceived birth occurred in England in 1978, after many years of work by Drs. Patrick Steptoe and Robert Edwards. Drs. Howard and Georgeanna Jones were responsible for the first IVF birth in the USA in 1981. The opening of their clinic in Norfolk, Virginia, was very controversial at the time. Controversy over IVF waned rather rapidly. However, third-party reproduction procedures, including sperm donation and especially those that developed in the 1980s due to the availability of the IVF process, caused and continue to cause significant controversy today.

While there are many ethical, psychological, and legal complexities to donor insemination, the new third-party reproduction options that resulted from IVF raised many new and more complex questions. Donor insemination involves at most three people—the sperm donor, the woman who is inseminated with the sperm, and the woman's partner or husband, if she has one. There are essentially no medical risks with donor insemination, and the cost of donor insemination is relatively little. In contrast, the third-party reproduction procedures that have resulted from IVF can involve as many as five people—sperm donor, egg donor, gestational carrier, intended mother, and intended father. Also, in contrast to sperm donation, gestational carriers and egg donors are at risk for medical complications, and the cost of using gestational carriers and egg donors is extremely high. Thus, it is not surprising that

the advent of these more complex third-party reproduction procedures has generated so much interest and controversy.

Third-Party Reproduction: *A Comprehensive Guide* utilizes experts in the field to address the medical, psychological, ethical, and legal aspects of sperm donation, egg donation, embryo donation, and the use of gestational carriers. In addition, there are chapters on the medical and ethical aspects of posthumous reproduction, religious aspects of third-party reproduction, and how to avoid pitfalls of third-party reproduction.

This comprehensive guide to third-party reproduction will provide practical insights to all involved with third-party reproduction as well as patients who are considering third-party reproduction.

Cleveland, OH, USA James M. Goldfarb

Contents

Contributors

Linda D. Applegarth, B.A., EdM, EdD. Department of Obstetrics and Gynecology and Reproductive Medicine, Ronald O. Perelman-Claudia Cohen Center for Reproductive Medicine, New York, NY, USA

Kavita Shah Arora, M.D., M.B.E. Department of Obstetrics and Gynecology, Northwestern University, Chicago, IL, USA

Jessica Wilen Berg, J.D., M.P.H. Case Western Reserve University School of Law, Cleveland, OH, USA

Mindy Berkson Lotus Blossom Consulting, Chicago, IL, USA

Valarie K. Blake, J.D., M.A. Department of Ethics, American Medical Association, Chicago, IL, USA

Christopher Brede, M.D. Department of Urology, Glickman Urological and Kidney Institute, Cleveland Clinic, Cleveland, OH, USA

Lindsay Childress-Beatty, J.D., Ph.D. Ethics Office, American Psychological Association, Washington, DC, USA

Stephanie O. Corley, J.D. Dean Lindsey Cowen Research Fellow, Case Western Reserve University School of Law, Cleveland, OH, USA

Susan L. Crockin, J.D. Georgetown University Law Center, O'Neill Institute for National and Global Health, Washington, DC, USA

Joao Correia De Pinho, M.D. Division of Reproductive Endocrinology and Infertility, Department of Obstetrics and Gynecology, Baylor College of Medicine, Houston, TX, USA

William E. Gibbons, M.D. Department of Obstetrics and Gynecology, Baylor College of Medicine, Houston, TX, USA

Division of Reproductive Endocrinology and Infertility, Texas Children's Hospital Pavilion for Women, Houston, TX, USA

James M. Goldfarb, M.D., M.B.A. Fertility Services and In Vitro Fertilization, University Hospitals of Cleveland, Cleveland, OH, USA

Clinical Professor of Reproductive Biology, Case Western Reserve University, Cleveland, OH, USA

Dorothy A. Greenfeld, M.S.W. Department of Obstetrics, Gynecology and Reproductive Sciences, Yale University School of Medicine, New Haven, CT, USA

Alyssa A. Henning, M.A. Department of Religious Studies, Northwestern University, Evanston, IL, USA

Hannah L. Kushnick, M.A. Department of Ethics, American Medical Association, Chicago, IL, USA

Michelle L. McGowan, Ph.D. Department of Bioethics, Case Western Reserve University, Cleveland, OH, USA

Maxwell Mehlman, B.A., J.D. The Law Medicine Center, Case Western Reserve University School of Law, Cleveland, OH, USA

Lauren M. Nussbaum, J.D.(c), M.A. American University Washington College of Law, Washington, DC, USA

Bonnie G. Patel, M.D. Division of Reproductive Endocrinology and Infertility, Department of Obstetrics and Gynecology, University Hospitals Case Medical Center, Cleveland, OH, USA

William D. Petok, Ph.D. Independent Practice Baltimore, Maryland, Baltimore, MD, USA

Brooke V. Rossi, M.D. Department of Obstetrics and Gynecology, Case Western Reserve School of Medicine, University Hospitals Case Medical Center, Beachwood, OH, USA

Edmund Sabanegh, Jr., M.D. Department of Urology, Glickman Urological and Kidney Institute, Cleveland Clinic, Cleveland, OH, USA

Julie R. Severson, Ph.D., J.D. University of Washington School of Law 2, Seattle, WA, USA

Margaret E. Swain, R.N., J.D. The Law Office of Margaret E. Swain, Towson, MD, USA

Leah Wilson, M.A., B.S.N., R.N. Department of Bioethics, Case Western Reserve University, Cleveland, OH, USA

Laurie Zoloth, Ph.D. Department of Religious Studies, Northwestern University, Evanston, IL, USA

Part I

Oocyte Donation

Medical Implications of Oocyte Donation

1

Joao Correia De Pinho and William E. Gibbons

Introduction

Fertility treatments have radically changed the outcome for patients who otherwise would not have an opportunity to reproduce. Indications and choices have expanded progressively, with most advances relying on the availability of the patient's own genetic material. When this latter is not an option, the use of egg donation (DE) becomes a management alternative. The demand for fertility treatments using oocyte donation has increased exponentially. The process in which donors participate resembles the one for in vitro fertilization and embryo transfer (IVF/ET). There are some important particular procedural differences, however, that are specific to the donor's and recipient's cycles, representing an added challenge for the reproductive endocrinology team. New cryopreservation systems are permitting the creation of an additional pool of donor oocytes and may increase the opportunities for potential recipients. Although DE gives infertile women the opportunity to conceive, it may expose them to unforeseen procedural, gestational, and long-term risks. Over the years, many claims have been lodged regarding the medical consequences for donor, mother, and the offspring born through the oocyte donation process. A detailed literature review demonstrates the existence of some misconceptions of the past and the need to update previous recommendations addressing the management of donor programs. The main objective of this chapter is to review and explain the oocyte donation process and detail possible medical implications for donors, recipients, and offspring. We will explore these possibilities and related new fields that might either create new sources of oocytes or improve current practice.

J.C. De Pinho, M.D.
Division of Reproductive Endocrinology and Infertility, Department of Obstetrics and Gynecology, Baylor College of Medicine, 6651 Main St., 10th Floor, Houston, TX 77030, USA
e-mail: pinhoja@gmail.com

W.E. Gibbons, M.D. (✉)
Department of Obstetrics and Gynecology, Baylor College of Medicine, Houston, TX, USA

Division of Reproductive Endocrinology and Infertility, Texas Children's Hospital Pavilion for Women, 6651 Main Street, # 1020, Houston, TX 77030, USA
e-mail: gibbons@bcm.edu

History of Oocyte Donation in Reproductive Medicine

Development of Egg Donation in Assisted Reproductive Technology

In the mid-1980s, two scientific teams continents apart (Australia and North America) worked simultaneously to produce the first donor pregnancy, reporting successful pregnancies in 1984. These pregnancies were conceived using two different methods. The Los Angeles group, led by M. Bustillo and J. Buster, first inseminated

J.M. Goldfarb (ed.), *Third-Party Reproduction: A Comprehensive Guide*,
DOI 10.1007/978-1-4614-7169-1_1,

donors with the recipient's husband's sperm followed by uterine lavage with a specially created catheter. Embryo recovery took place 5 days after insemination, and the synchronization of the recipient's endometrium was achieved with oral contraceptives [1, 2].

However, the first successful donor oocyte cycle is generally attributed to P. Lutjen (Australia), who reported in Nature on a 25-year old with primary ovarian insufficiency [3]. It was remarkable for the use of donor oocytes from an infertile patient (with tubal factor) that were inseminated with the recipient partner's sperm. Synchronization of the endometrium was achieved with a combination of oral estradiol valerate and an intravaginal progesterone pessary. The resulting single two-cell embryo was transferred to the recipient's uterus, and the recipient was maintained on continuous estrogen and progesterone support throughout the pregnancy, with delivery at 38 weeks via scheduled cesarean section [3]. This landmark event in a recipient with no ovarian function of her own further substantiated the observations that exogenous estrogen and progesterone could reliably produce a receptive endometrium.

Indications for the Use of Egg Donation

New Perspectives

In an attempt to simplify the increasing number of indications cited for the use of DE, we propose a classification of patients, based on a woman's ovarian function (Fig. 1.1) [1, 4–7]. This approach will initially distinguish between women with and without recognizably altered ovarian function.

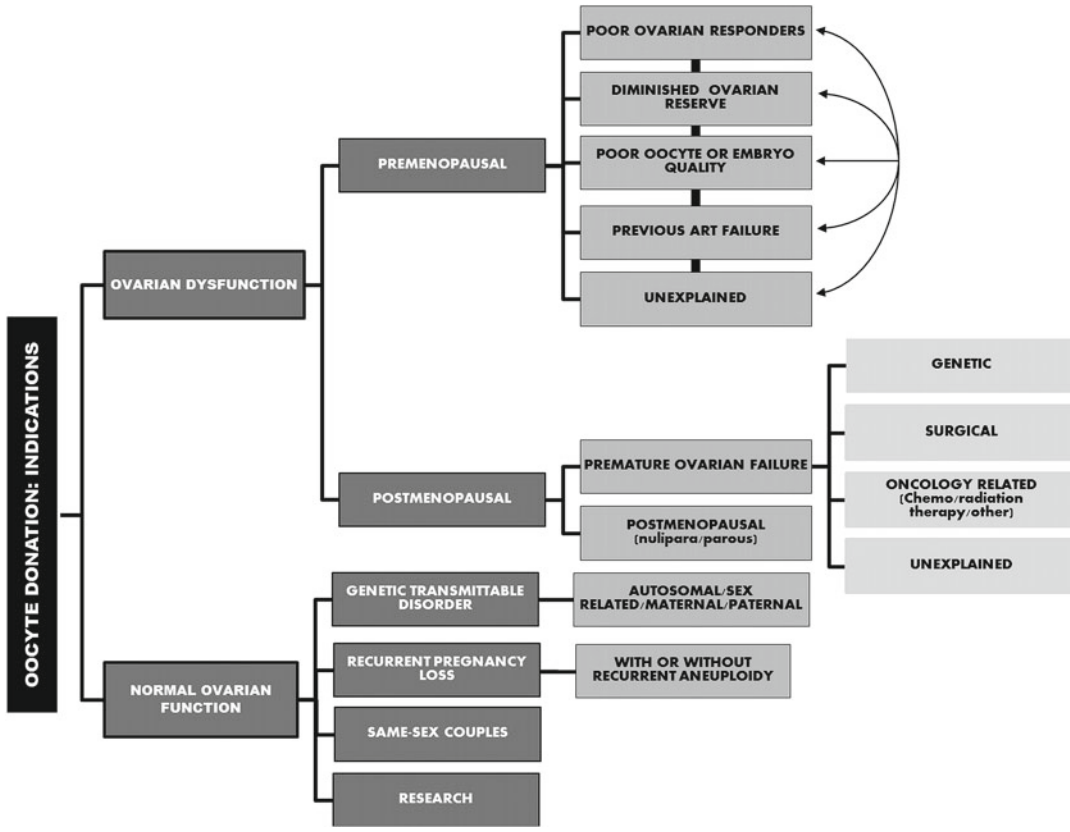

Fig. 1.1 Indications for the use of donor oocyte

Recipients with ovarian dysfunction may further be separated into patients that are known to be either premenopausal or postmenopausal. Indications for the use of DE in premenopausal patients in whom the ovarian function has not ceased are decreased ovarian reserve or poor response to controlled ovarian stimulation in previous IVF cycles. Frequently, patients will have one or a combination of the following: poor-quality eggs, reduced number of retrieved oocytes, and/or a large number of canceled IVF/ET cycles.

Data have confirmed that fertility is most dependent on the oocyte's age. Age-related decrease in ovarian reserve is the most common reason (47 %) for the use of DE according to the SART 2010 dataset, with little variation since 2003 [8–14]. Often women whose ovaries are functioning will use oocyte donation after consecutive failures to produce multiple mature oocytes with controlled ovarian stimulation (COH) during attempted IVF cycles. These women are generically termed as *poor ovarian responders*. Continued attempts using their own eggs may put them at increased risk for miscarriage and will definitely greatly increase cancellation of IVF cycles due to poor response to COH.

A postmenopausal state is defined by either primary or secondary amenorrhea and characterized by symptoms related to low estrogen and an associated increase in gonadotropin serum concentrations. Furthermore, menopause is defined as premature or age appropriate, if the ovarian function cessation occurred before or after the patient reached 40 years of age, respectively. Premature ovarian failure (POF) affects approximately 1 % of all women, and it may be secondary to abnormal chromosomes, autoimmune disease, or removal of both ovaries [15–18]. In addition, women undergoing radiation and/or chemotherapy are at risk for premature ovarian failure if they do not undergo fertility-sparing procedures before cancer therapy. Newer techniques in freezing (i.e., vitrification) have made it possible for most of these women to use oocyte or embryo cryopreservation before cancer therapy with excellent fertility rates [19], thus avoiding the need for donor eggs. In patients with POF for chromosomal reasons, those with Turner's syndrome must, before undergoing DE, be evaluated for cardiac problems, which may put them at life-threatening risk if they should get pregnant [20–22]. There has been a substantial increase in the number of postmenopausal women seeking the use of DE. There has been some difficulty in determining universally recommended upper age limit exclusion, and there are many national and regional differences. Many programs in the USA consider the age of menopause, 50–55 years of age, as an appropriate boundary and in accordance with the current consensus by the American Society of Reproductive Medicine (ASRM) [23].

In the past, many women with normal ovarian function used donor oocytes because of genetically transmissible disorders [24–27]. This indication for the use of DE is much less common now, with the advent of preimplantation genetic diagnosis (PGD). Before egg donation was available, the only option for same-sex male couples was traditional surrogacy and adoption. These couples/individuals can now use donor eggs, fertilize the eggs with their sperm, and then put resulting embryos into the uterus of a gestational carrier. Finally, in a category separate from the previously listed indications is the use of donated oocytes for research. This area continues to be the subject of controversy that shifts constantly, depending on the social, legislative, and scientific arenas.

Current Practice Recommendations

Guidance and Standardization in Donor Programs

The subject of oocyte donation has been, since its inception, embroiled in much controversy, with important socio-medical-economic implications for all the participants. Unlike programs using autologous oocytes, egg donor programs involve donation of part of the genetic pool or all of the pool if sperm donation is also used (donor oocyte and/or sperm) with the recipient, partners, offspring, supporting social structures constituted by family, and the medical team, to name a few, all playing important roles. It is imperative for a

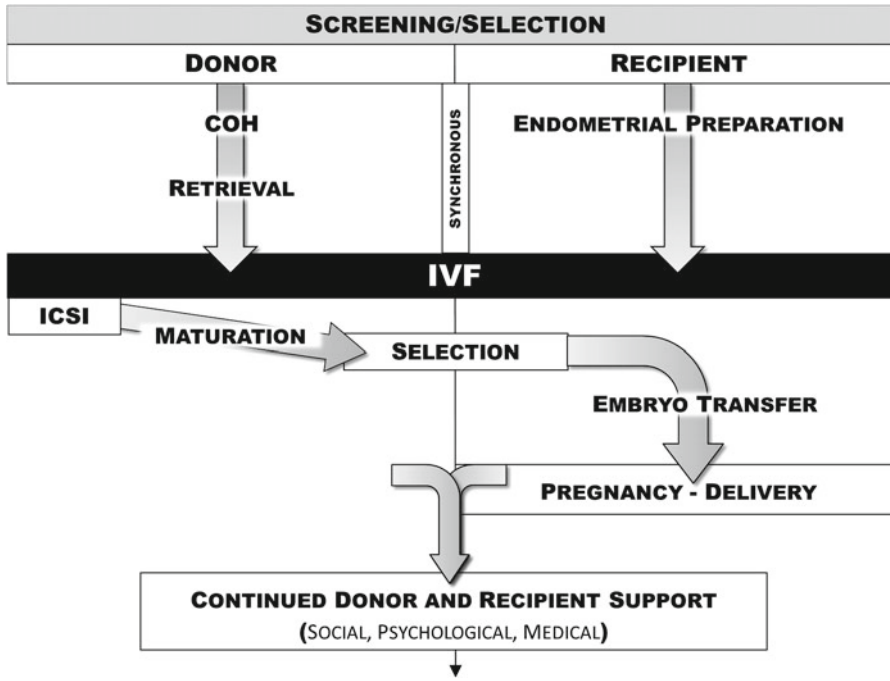

Fig. 1.2 Components of the donor oocyte process

successful reproductive DE program that donors and recipients undergo adequate screening and counseling, provided by a team of fertility specialists using a holistic approach (i.e., reproductive endocrinologist, mental health specialist, nursing staff, and embryologist) [23, 28]. This creates a system with multiple medical checkpoints that will increase program safety by correctly and carefully identifying inclusion and exclusion criteria. Although individual countries vary, nowadays the scientific community, along with organizations that represent both the legislative and sociological branches of society, has tried to find common principles to guide the participants engaged in oocyte donor procedures [29]. Following the principle of protecting all participants involved in the DE process, both the European Society of Human Reproduction and Embryology (ESHRE) and the ASRM, along with other US agencies (Centers for Disease Control and Prevention [CDC], US Food and Drug Administration [FDA], and American Association of Tissue Banks [AATB]), have developed guidelines clarifying the recommended practices in DE [29–40] (Fig. 1.2).

Informed Consent, Privacy, and Data Storage

Oocyte donation, as any other medical procedure, requires patients to be fully informed of all the proceedings, selection requirements, pre- and post-selection medical workups, medications, side effects, their short- and long-term associated risks, potential complications, and realistic outcomes that are institution specific. Because of the complexity of oocyte donation, the vast volume of information should to be provided in a stepwise approach. Donor program records should remain confidential as predefined by contractual agreements along with participants' specifications regarding anonymity and the future release of information. Participants should be entitled to make determinations on oocyte and embryo surpluses (in cases of shared-IVF or canceled cycles). Disclosure of any medical information should follow strict medical guidelines in accordance with legislative rules of countries involved and should be sensitive to regional, ethical, religious, and personal beliefs. There is also some debate about the longevity of these records, with

the current FDA requirement being a 10-year minimum [40]. It is not uncommon for treatment centers to close, change location, or be integrated into other institutions. Given twenty-first-century technology and recent advances of electronic medical records (EMRs) that now permit creation of proper access safeguards and up-to-date maintenance of database-integrated infrastructures, we recommend that these records should, when possible, become a permanent part of both the treatment center and a centralized national registry.

Candidate Selection and Screening

Recipients and Partners

The evaluation of recipients should begin with acquisition of medical and reproductive histories, focusing on the detection of any reproductive abnormalities that might require additional evaluation. Psychological screening and continuous support should be provided to both recipient and partner. A complete general physical and pelvic examination of the recipient should follow. It is commonly recommended that the uterine cavity be assessed through the use of hysterosalpingography (HSG) or hysterosonogram to identify any uterine abnormality prior to embryo transfer [41]. In the presence of a uterine anomaly, hysteroscopy may be warranted for both diagnostic and therapeutic management. If hydrosalpinges are detected, there is strong evidence supporting the value of salpingectomy or tubal occlusion to increase the success of the IVF cycle and decrease the risk for ectopic pregnancies. Preconception testing and counseling are recommended: blood type, Rh factor, and antibody screen; rubella and varicella titers; syphilis serology; hepatitis B surface-antigen and B core antibody [IgG and IgM]; hepatitis C antibody; *Neisseria gonorrhoeae* and *Chlamydia trachomatis* testing; and HIV-1 and HIV-2 testing, and recommended preconception immunizations should be offered. Although practices around the world are diverse, ASRM recommends that a positive HIV test in a recipient should not be considered sole criteria for exclusion from treatment [23]. Male partners who will be providing the sperm should have a similar evaluation in addition to a semen analysis. Additional examinations should be guided by abnormal findings or specific risks associated with particular types of patients. A substantial portion of these patients are older and more prone to have certain chronic diseases (i.e., hypertensive disorders, diabetes) and be receiving long-term medication that might be contraindicated during the gestational period. Having an established referral to tertiary centers to be followed by high-risk obstetrical teams is highly recommended. Another special group, as discussed earlier, are patients with Turner's syndrome. They are prone to the development of cardiovascular disease and endocrinopathy, among many other chronic medical conditions. It is of major importance to assess their cardiovascular status because of their increased risk for aortic dissection during pregnancy [22].

Donors

The steady rise in the demand for donors in the last decade has been tempered by the reality of the limited pool of donors available, the impact of the ever-growing costs of egg donation programs, and increased numbers of potential recipients on the waiting lists [42–44]. Additionally, in the USA, the number of volunteer non-IVF donors is limited. A 10-year review of donor screening found that up to 62 % of the initial candidates eventually would be excluded [45]. There are two major oocyte sources: (1) volunteer fertile donors, who altruistically have decided to give their oocytes (non-IVF donors), and (2) women undergoing IVF cycles who have decided to share the unused surplus oocytes (IVF donors). Historically, women were offered the opportunity to voluntarily share their oocytes in IVF cycles, in an attempt to lower the costs and decrease waiting times [42–44]. Volunteer donor cycles are further classified according to the number of recipients, as *exclusive* or *nonexclusive donor cycles*. In *exclusive-IVF donor cycles*, all oocytes are given to one recipient. On the contrary, in *shared-IVF donor cycles*, the donated oocytes are divided among several recipients (generally two). *Shared-IVF oocyte donor* programs have been shown to be cost-effective to increase the number of donor cycles, to decrease the waiting period [43, 46], and to result in equivalent fertility outcomes.

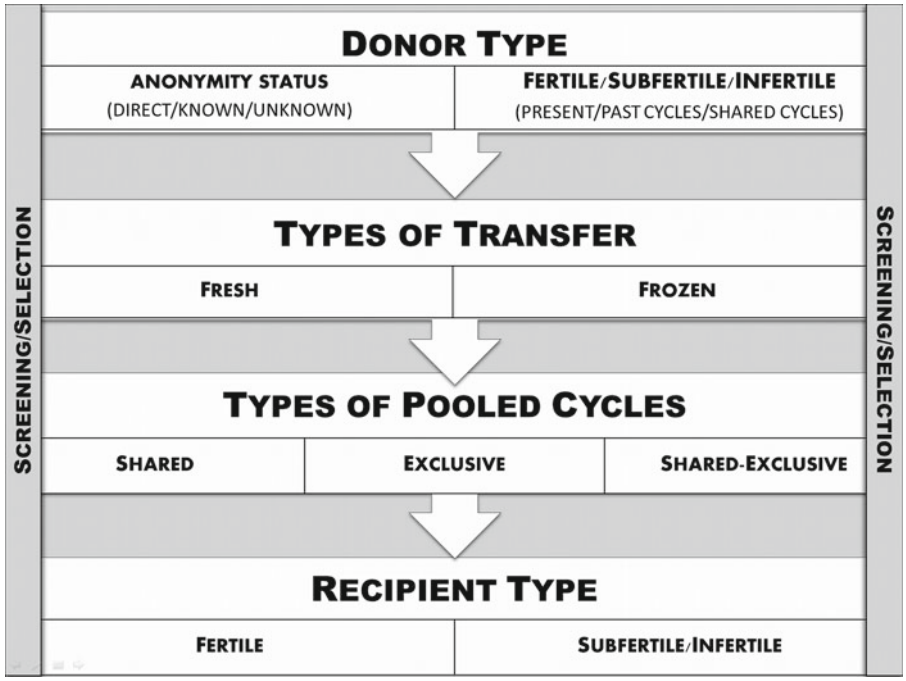

Fig. 1.3 Candidate selection and screening (donor and partner screening)

Donors may be further classified according to their relation to the recipient (*direct/known, known*) and anonymity status (*anonymous* vs. *known donors*). Direct/known donation occurs fairly commonly. Stressors on relationships between family and friends of donors are common and should be anticipated and managed prior to commencing any cycle [40, 47] (Fig. 1.3).

In the USA, unlike other countries in the world, donor solicitation is permissible [48]. Motives for donation should be assessed, and inclusion of donors should be in accordance with strict ethical guidelines provided by global, federal, local, and scientific regulatory organizations. Individual practitioners are advised to analyze each case individually with the help of a team of healthcare professionals who specialize in reproductive care. We further recommend that each institution or clinic consult an established ethics committee to further analyze complex cases.

The ASRM recommends that donor age be between 21 and 34 years, although there is considerable variation among centers [49]. If the donor is younger or older, recipients should be properly informed about the increased cytogenetic risk and the effect of donor age on pregnancy rates. The screening should comprise evaluation of substance use and personal, sexual, and family psychiatric history. Personal and sexual history should be obtained, with the intent of excluding those women at high risk for HIV or other sexually transmissible diseases [40]. As an integral part of any program, donors and their partners should have a psychological evaluation by a qualified mental health professional assessing the psychological adequacy of the potential donor. It is also important to consider the donor's understanding of the psychological risks and complications involved in the donation process [40]. This will lead to an informed consent that is tailored to each donor. The scarcity of donors makes it important to be watchful for any form of financial or emotional coercion that might exist and that should be regarded always as a criterion for exclusion. Donors should also undergo a complete genetic assessment with specific focus on any major Mendelian disorders, major malformations due to multifactorial causes, or known

karyotypic abnormalities in the potential donors or in any of their first-degree relatives. Additional testing should be done in accordance with regional and ethnic donor backgrounds, with a strong recommendation that all are screened with the most up-to-date cystic fibrosis and fragile X testing [40]. A heterozygote may be included as a donor if the recipient couple is made aware and the recipient's partner tests negative [50]. Updated testing within 1 month for anticipated oocyte retrieval is required by the FDA (blood type, Rh factor, and antibody screen; rubella and varicella titers; syphilis serology; hepatitis B surface antigen and B core antibody [IgG and IgM]; hepatitis C antibody; *Neisseria gonorrhea* and *Chlamydia trachomatis*; and HIV-1 and HIV-2). Any positive test result requires a confirmatory exam, and the individual should be referred for appropriate counseling and management. The ASRM previously considered cryopreservation of oocytes as experimental, but that judgment is now being reversed, with some groups utilizing frozen oocytes, which eliminates the need to coordinate donor and recipient cycles. Using frozen eggs also allows programs to more comfortably share eggs. If a donor makes a lot of eggs, the eggs can be shared; if not, they will be used for only one recipient. Some also feel an advantage of frozen eggs is that they can be quarantined for 180 days in a manner similar to quarantine of sperm donors. This would permit donor retesting in suspected cases for infectious transmittable diseases [51], although transmission of infectious disease has not been a problem with fresh eggs. Many donors will donate their oocytes more than once. There has been some discussion about the effects of multiple cycles of donations, due to concerns about the impact on future fertility [49, 52–54]. The ASRM recommends limiting egg donors to six donations.

Oocyte Donor Process: Methodology and Clinical Practice

The process of oocyte harvesting is similar for donor and non-donor women undergoing COH, oocyte retrieval, and IVF/ET, although some minor differences exist. A particular challenge is imposed by the use of fresh donor oocytes, which requires a timely and precise synchronization of the donor stimulation protocol with endometrial preparation of the recipient. This requires an experienced reproductive team that will monitor donor and recipient closely. Even though the majority of donor cycles will be synchronized with embryo transfer (ET) after fresh retrieval, the use of newer cryopreservation techniques (i.e., vitrification) with excellent outcomes is becoming more popular and does not require synchronization between the donor and recipient [55–58].

Ovarian Stimulation and Retrieval of Donor Oocytes

Oocyte donors undergo COH in a manner similar to those undergoing conventional IVF. Gonadotropins ("fertility shots") are used to stimulate the ovaries to produce many mature eggs in contrast to a natural menstrual cycle in which only one egg is produced. All stimulation protocols also follow the principle of downregulation of the pituitary gland to prevent an endogenous LH surge, which would cause the eggs to be released from the ovary before egg retrieval. Final maturation of the eggs is triggered with hCG (a substitute for LH) or, possibly, a GnRH agonist. This sequence of events has to occur with precision, while at the same time, the recipient's endometrium is stimulated to make it receptive to embryos (assuming the plan is for transfer of fresh embryos). Even with many safeguards to prevent risks and side effects of COH and egg retrieval, potential complications need to be explained to the patient and anticipated by the medical team [59]. Irrespective of the donor's profile, the rate of ovarian hyperstimulation syndrome (OHSS) seems to be lower in the donor than in *non-donor IVF patients* since these women will not become pregnant. Pregnancy further stimulates the ovaries, thus the increased incidence of OHSS in non-donor IVF cycles [60–68]. It also important to confirm that donors adhere to the protocols and receive counseling regarding the risk of becoming pregnant during the stimulation process [69]. We strongly recommend that patients be counseled to maintain

abstinence during the stimulatory cycle and until the following menses and that unless contraindicated, oral contraceptives (OCs) should be considered in the cycles preceding the FSH stimulation at this time. The use of OCs in donor programs also allows efficient downregulation and donor–recipient coordination if fresh embryo transfer is planned.

Most protocols will involve daily injections of gonadotropins with an FSH-like action commencing in the first 2–5 days of the menstrual cycle and continuing for 7–12 days, depending on ovarian response. Substantial variations of protocols are common, and the one chosen will depend on the profile of the particular donor and the achievement of suitable endometrial development in the recipient. Monitoring of the chosen protocol is done by frequent ultrasound monitoring of growth of the developing follicles and serum estradiol levels. Once the follicles are of the size that indicates the eggs inside them are ready to be matured, a trigger shot is given to finalize the maturation of the eggs. The eggs are then retrieved from the ovary approximately 36 h later. The eggs are retrieved by a vaginal route under ultrasound guidance. The patient is generally given mild sedation.

The use of newer protocols using GnRH antagonist as the trigger shot has been advocated by some groups who point to the advantage of shorter duration of stimulation [70–72]. The GnRH antagonists are started after gonadotropin initiation with the added advantage of an immediate pituitary downregulation effect that is efficacious in the prevention of LH surges. Because of their effectiveness in suppressing pituitary function later in the cycle, there seems to be the potential for reduction in the amount of gonadotropin required and the duration of treatment (an average of 1 day less of stimulation) compared to agonist protocols [73, 74].

Preliminary studies have shown no significant difference in pregnancy rates between protocols using agonists and those using antagonists [74, 75]. A meta-analysis by Bodri et al. evaluated a total of 1,024 oocyte donors in eight RCTs, comparing GnRH agonist and antagonist protocols, and found no significant difference in the number of oocytes retrieved or ongoing pregnancies [72].

Recipient Endometrium Preparation

Lutjen et al. reported the first donor pregnancy achieved in a POF patient with the use of combined steroid replacement therapy, oral estradiol valerate, and vaginal progesterone suppositories, creating the basis for current regimens [3]. The high mitotic proliferative phase depends on estrogen stimulation to produce a functional proliferative endometrium, which contrasts with the postovulatory secretory phase dependency on corpus luteum progesterone secretion to induce an endometrium suitable for implantation. The main benefit of hormone replacement treatments is to better adjust embryo transfer timing. Two distinct events in the oocyte donation cycle need to be synchronized: COH must be achieved in the donor, and the endometrium must be prepared in the recipient. The length of the follicular phase may vary from 10 to 30 days without detriment to implantation or pregnancy rates [76–78]. To circumvent the asynchrony between donor's and recipient's cycles, patients are offered hormonal replacement therapy, GnRH agonists, and, now, sometimes, cryopreservation of the donor oocytes and embryos. The need for GnRH downregulation of the recipient has been felt by some to be unnecessary. Prompt initiation of estrogen therapy is necessary early in the menstrual cycle to suppress FSH levels and prevent follicular development. This can be further assisted by use of oral contraceptives in the preceding cycle [79, 80].

Estrogen Preparations

Since Lutjen's reports, most programs have based their recipient endometrial preparation protocols on estradiol administration, followed by progesterone supplements available in various formulations, with or without prior pituitary GnRH downregulation. Starting estrogen on the first day of the cycle serves to prevent spontaneous ovulation by suppressing follicle-stimulating hormone (FSH) and follicular recruitment. This hormonal replacement protocol is valid only for cycling women undergoing donated fresh or cryopreserved embryo transfer. Anticipating that the

donor stimulation interval may be shorter than the follicular phase of a normal menstrual cycle, it is common to start the recipient's estrogen therapy prior to initiation of donor gonadotropin therapy. There are both fixed and flexible estrogen protocols. Fixed sequential protocols provide a constant oral (4–8 mg/day) or transdermal (0.2–0.4 mg/day) estradiol dosage. The recommendations on the duration of estrogen priming prior to progesterone administration have shifted from the classical minimum of 2 weeks to a shorter period of as little as 10 days with similar fertility outcomes [77, 81, 82]. Good pregnancy rates have resulted from extended estrogen administration when transfer has been postponed for a period of up to 2 months [83]. Monitoring estrogen levels has not been found to benefit the outcome in recipients [84]. Most programs merely ultrasonographically measure the endometrial thickness.

Pharmacologically, estrogen may be used orally, transdermally, vaginally, and through subcutaneous implants. Oral micronized and valerate estradiol formulations are currently the two most commonly used oral regimens, with primary intestinal conversion to estrone. Estradiol undergoes a first hepatic pass with conversion to estrone glucuronide with a decrease of 30 % bioavailability [85]. There is some evidence to suggest greater premature luteinization when oral estrogen formulations are used in recipients with retained ovarian function [86, 87]. The vaginal application of polysiloxane-impregnated or micronized estradiol valerate rings has an excellent absorption profile [88] with a steady state after an initial flare when compared to cream formulations with only 25 % activity of oral formulations [89]. A further advantage of this route is that it is not associated with any increase in serum lipoproteins or changes in clotting factors and renin substrate [90]. Some of the shortcomings of this route are low compliance due to local irritation, discomfort, and interactions with vaginal progesterone (inhibiting vaginal ring estradiol valerate absorption) [25]. The transdermal patches, applied to the lower abdomen, are available in doses that deliver 0.0375 to 0.1 mg of estradiol per day that bypass the first metabolic pass and maintain a high 1.25 ratio of estradiol to estrone that compares with a 1.0 ratio in a natural cycle and inverse 0.2 ratio with oral formulations [90]. It is now the preferred route of administration in many centers.

Progesterone Preparations

The use of exogenous progesterone in ART is vital to artificial replication of the physiological postovulatory endogenous production by luteinized granulosa cells, transitioning the endometrium to a secretory pattern that is receptive to embryo implantation. Moreover, there is a narrow time interval in which to properly initiate progesterone replacement therapy. Outcomes data conflict about the best time to initiate progesterone replacement with regard to the oocyte retrieval. Escriba et al. [91] randomized recipients of fresh donor oocytes to start progesterone the day before, the day of, and the day after oocyte retrieval (OR) and reported higher PR (OR 1.87, 95 % CI 1.13–3.08) in those who received replacement therapy on the day of or the day following egg retrieval.

Although IM progesterone may reach higher concentrations than those associated with the vaginal route, endometrial maturation has been found to be more heterogeneous and associated with less discomfort [7, 92]. Devroey et al. and Bourgain et al. further demonstrated that the vaginal administration of micronized progesterone induces a secretory endometrial pattern resembling a natural cycle, despite having five times lower serum concentrations than intramuscular formulations (mean concentrations, 8.09 g/L and 43.4 g/L, respectively) [79, 92]. Also, Miles et al. found no differences by assessing histologic, ultrasonographic, or immunocytochemical receptor features when IM and vaginal formulations were compared [93]. Older vaginal formulations (suppositories) given three times daily, even though found to be effective, resulted in messy vaginal secretions. Although IM administration resulted in higher serum levels of progesterone, vaginal administration produced endometrial tissue levels of progesterone that were almost tenfold higher [93]. A low-volume natural progesterone, nonimmunogenic, polycarbophil in a lightly cross-linked polymer-based gel

(Crinone 8 %, 90 mg of micronized progesterone; Columbia Research Laboratories, Inc., Rockville Center, NY) permitted prolonged, sustained delivery (>48 h) that binds to vaginal epithelium. Furthermore, Gibbons et al. first demonstrated that the use of vaginal progesterone (Crinone) twice daily was as effective as the IM route in producing clinical and ongoing pregnancies in donor programs [94]. Later the same group confirmed the endometrial development and no difference in pregnancy rates between groups receiving Crinone vaginally once a day and those receiving it IM [95]. Daily administration of Crinone 8 % (90 mg) has become the standard therapy in many programs for progesterone replacement in ART cycles. However, there are many programs that consider that IM progesterone is still preferable in egg donor cycles.

Endometrial Lining Monitoring and the Use of Mock Cycle

Ultrasonographic (US) assessment of the endometrial lining is often used as an indirect measure of response to hormone replacement and endometrial receptivity. The measurement of endometrial thickness (ET) has the apparent advantage of being a simple procedure and is an atraumatic method. However, there is some question about the ET predictor and cutoff values. Previous reports vary from a documented strong improvement in fertility, with an increase in endometrial lining thickness on the day of hCG administration, to findings of only a marginal effect on PR [97–99]. The mean ET cutoff values have indicated that a thin endometrium, with values below 6 mm, may be an indirect predictor for cycle failure, increased early pregnancy loss, and decreased implantation rate but should be interpreted with caution [100–104]. Moreover, a wider ET is associated with higher number of follicles, a larger dominant follicle on the day of hCG injection, and more in vivo and in vitro mature oocytes [96, 105]. A common practice in the presence of a thinner endometrial lining (i.e., less than 6 mm) at the time of the hCG injection is to increase the estrogen dosage, although there are no strong data to recommend this practice. Combined estrogen and progesterone replacement therapy is continued, replacing the absent corpus luteum, and is withdrawn 7–10 weeks after pregnancy is diagnosed, when placental autonomy is established.

The use of practice or "mock" cycles to confirm proper response of the recipient's endometrium to exogenous steroids has come into question. Some suggest that practice cycles may provide additional insight regarding the patient's ability to comply with the regimen and to overcome any difficulty in understanding and correctly following instructions. However, in the majority of cases, mock cycles have not proved useful. Most practices have abandoned the use of endometrial biopsies and use of mock cycles because of their poor predictive value.

Cryopreservation

Cryopreservation of oocytes in treatment of infertility spans more than 2 decades and is a well-established practice that, with recent technical advances, provides improved survival and pregnancy outcomes. The initial methodology of slowly freezing oocytes was used successfully by Chen in 1986, but it was associated with limited and variable pregnancy rates ranging from 8 to 33 % [38, 106–113]. Following the first human pregnancies and births of healthy children using a vitrified oocyte by Hong et al., in 1999, and by Yoon et al., in 2000, a new era for the use of cryopreservation in ART ensued. Vitrification is the use of rapid cooling rates (15,000–30,000 °C per min) and high concentrations of cryoprotectants with the intent to produce a vitreous (i.e., glass-like) cellular construct that is expected to be sustained during the warming process and thus avoid ice crystal formation [115, 116]. This advance has permitted major improvements in oocyte survival, fertilization, and embryo development with outcomes comparable to those with fresh oocyte cycles [117–124].

The ASRM guidelines of 2008 have recently been replaced by the 2012 practice committee in a bulletin acknowledging that cryopreservation

of oocytes is no longer considered experimental and is a safe practice with fertility success comparable to that of IVF/ICSI with fresh embryos. DE program limitations (i.e., long waiting lists, regulatory and legislative constraints) could potentially be lessened by establishing efficient banks of cryopreserved donor oocytes [125].

Medical Complications and Implications of Oocyte Donation

To better understand the medical consequences for the donor, recipient, and offspring, it is important to be able to correctly interpret the most up-to-date scientific information. In a 2007 workshop held by the Institute of Medicine, a committee led by Dr. Linda Giudice, along with some of the most prominent authorities in the field of reproduction, examined the medical risks of human oocyte donation and provided a document reporting a current assessment of some concerns [59] (Table 1.1).

Table 1.1 Medical complications of oocyte donation

Short term
Donor
1. OSSH
2. Ovarian torsion
3. Pain
4. Anesthetic
5. Surgical
6. Bleeding
7. Infection
8. Psychological
Recipient
Medical complications in pregnancy
1. Miscarriage
2. Aneuploidy
3. Multiple pregnancy
4. Hypertensive disorders in pregnancy (i.e., gestational hypertension, preeclampsia)
5. Premature birth
6. Placenta pathology
7. Cesarean section
8. Fetal and neonatal mortality
9. Psychological
Offspring
1. Developmental
2. Genetic
3. Psychological
Long term
Oncologic
1. Breast, ovarian, and uterine
Fertility
1. Future sub/infertility
2. Premature menopause

Short-Term Medical Implications

Donor Complications

Ovarian Hyperstimulation Syndrome

It is not surprising that women may have some form of abdominal pain during COH when multiple numbers of follicles are developing, since one in five women has associated pain with a sole developing dominant follicle halfway into a normal menstrual cycle [126]. Pain following egg retrieval may, however, be an early indicator of ovarian hyperstimulation syndrome (OHSS), which is the most frequent and, rarely, a potentially life-threatening short-term complication of the DE process. The main causative factor for the development of OHSS is the administration of the ovulation-inducing hCG, inducing the release of inflammatory mediators (i.e., vascular endothelial growth factor [VEG]), increasing the vascular permeability, fluid shift, and third spacing into several virtual spaces (i.e., abdomen, pleura), and decreasing the effective intravascular volume with consequent hemoconcentration [127–129].

The diagnosis is usually clinical and based frequently on gastrointestinal and respiratory symptoms that occur commonly within the first 10 days after triggering of ovulation or oocyte retrieval. Nausea is an early finding, followed in sequence by abdominal discomfort and distention. The increase in intra-abdominal pressure may be sufficient to disrupt coagulation (i.e., stasis in the lower limbs) and the normal diaphragm-assisted respiratory movements, leading to dyspnea and labored breathing. Depending on the severity of the complication, resolution occurs within a few days or weeks, during which time

the patient requires close monitoring. OHSS can be classified as mild, moderate, or severe depending on the clinical and laboratory findings [63]. Mild OHSS is experienced in up to 20–30% of patients undergoing ART procedures, generally with no serious complications, and with most experiencing spontaneous resolution. Moderate OHSS, with an incidence up to 10 %, is more concerning and is defined by greater fluid retention, ascites, dyspnea, and marked nausea and/or vomiting. These patients are usually handled on an outpatient basis with excellent outcomes. However, paracentesis may be required. Severe cases are rare in donor cycles with an estimated incidence between 0.1 and 0.2 % (1–2 cases per 1,000 COH) and are true emergencies. Donor cycle has a much lower chance of all classes of hyperstimulation than non-donor IVF because the establishment of pregnancy with its associated hCG production stimulates the ovaries in non-donor IVF cycles. In addition, the increasing use of gonadotropin-releasing hormone agonists as the ovulation trigger in egg donor cycles greatly decreases the rate of OHSS for egg donors.

Surgical Complications (Donor)

The risks associated with the oocyte retrieval process itself have changed substantially, as more aggressive surgical interventions (laparotomy and laparoscopy) have been replaced by ultrasonographically guided retrieval. Transvaginal ultrasound-guided oocyte aspiration, introduced in 1985 by Wikland et al., has permitted a safer approach with a rapid learning curve and a decrease in surgical and anesthetic risks in the retrieval process [130–134].

The National Academy of Sciences (NAS) reports an approximate risk of 0.002 % of patients requiring surgery. In one of the largest retrospective studies to date, Bodri et al. [68] assessed the complication rate in oocyte donation cycles through the analysis of 4,052 oocyte retrievals in a 6-year period. In this series, the authors reported a 0.42 % overall complication rate with oocyte retrieval. The most frequently reported complications were intra-abdominal bleeding (82 %), severe pain (12 %), and ovarian torsion (0.06 %), with only 0.35 % of all patients in the study having to be hospitalized and 0.15 % needing operative management. Moreover, there were no reported cases of pelvic infections, injury to pelvic structures, or complications related to anesthesia [68]. It is estimated that approximately 9 % of retrievals are associated with some degree of vaginal bleeding [130]. Usually such bleeding is minimal and resolves on its own or is stopped with local pressure or clamping of the bleeder, but in rare instances vaginal packing or vessel ligation may be necessary [130, 136]. It is important to screen patients for family and/or personal history suggestive of bleeding disorders.

Anesthesia has become very safe. According to the National Academy of Sciences, it is estimated that the general risk of death from anesthesia is 1 in 200,000–300,000 cases. Even though the risk for severe anesthetic complications may be low, it is still prudent to not accept potential egg donors who are at high risk, such as those with chronic diseases, obesity, and a high ASA ranking (from the American Society of Anesthesiologists physical status classification system).

Ovarian Torsion

The development of large adnexal cysts has a potential for ovarian torsion where the axial rotation may compromise the blood supply, a rare and serious complication of COH. Previous retrospective studies have reported an incidence of ovarian torsion varying from 0.024 to 0.13 % [68, 133, 134]. Women frequently develop a worsening in abdominal pain with or without peritoneal signs that will merit a full medical workup. The timing for torsion may lag 6–14 weeks after oocyte retrieval, since the risk of torsion increases with the softening of the ligaments that occurs in pregnancy. The use of ultrasonography may help in further narrowing the differential diagnosis. A laparoscopic evaluation in suspected cases is the norm, permitting adnexal salvage when performed early and, thus, avoiding the need for oophorectomy [68].

Infection

The reported risk of infection after retrieval, in most series, is between 0.01 and 0.6 %, with

potential sources being the vaginal flora and the bowel and potential complication being formation of abscesses [68, 130–133, 136]. The benefit of preventive antibiotics seems to be controversial [137], and an aseptic technique is the key to prevention of infectious complications (i.e., abscess formation) [68].

In conclusion, the potential for surgical complication secondary to oocyte retrieval is small.

Recipient Complications

Overview

Donor egg pregnancies are associated with higher incidence of some particular complications such as gestational hypertensive disorders, operative deliveries, and peri- and postpartum bleeding abnormalities [6, 69, 138–146]. Even though the etiology of some of these complications remains elusive, current literature is beginning to offer some clues about the pathways and mechanisms of disease.

It is important to differentiate between the risks inherent in the IVF process and the risks that may be increased in women who choose to undergo DE. Certain complications may be the consequence of the donor process itself. However, there are other variables, such as the patient profile (i.e., primigravidas), the type of infertility (i.e., premature ovarian failure), and patient's age, among many, that may play a role [9, 147]. Reliability of previous studies of oocyte donation outcomes often has been limited by absence of appropriate control groups [144] (donor IVF cycles with non-donor non-IVF cycles), variations in the demographics or the type of protocols used, and inadequate statistical power. Differences in obstetrical outcomes that might be recipient-specific have been addressed in a number of studies.

The majority of women using oocyte donation are older and more prone to developing medical complications. Age seems to be a possible confounder and is a known independent risk factor for chronic diseases (i.e., cardiovascular disease, diabetes) and with age-related obstetrical complications (i.e., gestational hypertensive disorders, gestational diabetes, preterm delivery, operative delivery, and lower birth-weight babies) [14, 148, 149]. Although there are conflicting results from studies based on age, most studies tend to depict favorable outcomes in all age groups up to the age of 45 years, regardless of etiology. Soares et al. reported significantly lower pregnancy rates and higher miscarriage rates in oocyte donation cycles in women over 45 years of age than in women younger than 45 [149]. Paulson et al. [14] investigated maternal and neonatal outcomes in a retrospective study. Oocyte donation in 77 postmenopausal women in their sixth decade (mean age, 52.8 years; range, 50–63 years) underwent 121 embryo transfers (89 fresh and 32 frozen) over a 10-year period with a pregnancy rate of 45.5 % and a live birth rate of 37.2 %. They noted an increased rate of mild preeclampsia (25 %) and severe preeclampsia (10 %), gestational diabetes (18 %), and cesarean section (68 %).

We follow the ASRM belief that egg recipients up to the age of 55 can be considered but particular caution must be used in anyone over 50 years old.

Multiple Pregnancies

It is well known that IVF is closely associated with the risk of multiple pregnancies and that the major contributing factor is the number of embryos transferred. In order to reduce the incidence of multiple pregnancies, physicians have begun to limit the number of embryos transferred. The incidence of multiple pregnancies also is highly dependent on the quality of embryos obtained and is affected by many other parameters, such as the interval to transfer and the patient's previous outcomes. In many cases, since the egg donors tend to be very young, excellent pregnancy rates can be achieved with transfer of a single embryo [8, 215–217]. Although single-embryo transfer will result in the lowest multiple pregnancy rates in DE cycles, it is interesting to note that the incidence of monozygotic twinning is higher in all IVF cycles and even more so when young eggs are used. Knopman et al. [152], in an 8-year retrospective review, reported a higher incidence of MZT, most representing monochorionic–diamniotic placentation (95 %). The incidence associated with autologous cycles

compared with donor cycles was 1.7 % and 3.3 %, respectively, and, interestingly, an incidence of 3.1 % in those of the autologous group who were under 35 years of age. Additionally, a difference was found in the incidence of MZT favoring fresh day 5 transfers when compared with day 3 transfers of 2.6 % versus 1.2 %, respectively [152]. Single embryo transfers are generally done on the fifth day.

Pregnancy-Related Complications

Previous reports have suggested that women undergoing in IVF are at increased risk for preeclampsia, preterm delivery, and low-birthweight offspring [153, 154]. Advanced maternal age, very common in egg recipients, is independently associated with increased incidence of chronic medical diseases and obstetric complications such as diabetes, hypertension, preeclampsia, premature rupture of membranes, second- and third-trimester bleeding, preterm delivery, and lower mean infant birth weights [13, 155, 156]. Henne et al. evaluated the obstetric complications in women of advanced maternal age conceiving with donor cycles. After controlling for age and multiple gestations, the group determined that donor oocyte recipients have an increased risk for preterm labor, preeclampsia, and protracted labor, leading to a higher rate of cesarean section deliveries [9, 157].

Placentation and Hypertensive Complications

Hypertensive disorders of pregnancy are some of the most common reasons for maternal and fetal morbidity and mortality, with the incidence of preeclampsia varying between 2 and 8 % in the general population [158, 159]. There is substantial evidence in the literature to suggest an association of donor pregnancies with an increased risk for gestational hypertensive disease with an incidence varying from 15 to 40 % [6, 66, 138, 139, 141–144, 160, 161]. It has been suggested that this increase is associated with patient-dependent variables (maternal age, parity) and not with the donor process itself [7, 147]. Klatsky et al., in a retrospective matched cohort study, confirmed the higher incidence for gestational hypertension and preeclampsia in DE recipients as compared to autologous IVF pregnancies (24.7 % vs. 7.4 %, [$p<0.01$], and 16.9 % vs. 4.9 %, [$p=0.02$], respectively) [162]. Wiggins and Main et al., in a retrospective review, reported a higher rate of gestational hypertension in donor oocyte recipients than in patients undergoing autologous IVF/ET cycles (26 % vs. 8 %; $p=0.02$). The contrast was also found to be accentuated in nulliparous women (37.1 % vs. 8 %; $p<0.003$) [163].

Earlier research showed an association between the development of preeclampsia and altered placentation that may rest on the hypothesized abnormality in the local immune-mediated maternal response against the allogenic circulating fetal debris [163, 164]. There is also some evidence demonstrating a higher risk for abnormal placentation in donor pregnancies with frequent pathologic findings of villitis, chronic deciduitis, massive chronic intervillositis, maternal floor infarction, and other ischemic changes [7, 9, 165–167]. In the immunological model described above, there seems to be an alteration of the normal immune-privilege fetal–maternal biome in donor pregnancies [168–170]. Studies further suggest that similarities in the fetal antigenicity (i.e., reflected by the number of HLA matches) may protect against the development of preeclampsia [171–175]. Even though multiparous women have lower rates of preeclampsia than nulliparous women [139, 141, 142, 144, 161, 176], this trend disappears in women conceiving in DE cycles, thereby supporting the theory of an altered immune tolerance as the etiological base of hypertensive disorders in these patients. This theory seems to be further supported by the incidence of preeclampsia, which in multiparous women with consecutive short intervals between pregnancies and with a new partner is higher than in nulliparous women who have previously had an aborted pregnancy with the same partner [177, 178]. Also arguing for this model are Kim et al. [179], whose retrospective study looked at the relationship between complications of pregnancy and the immunogenetic origin of donors after matching for age, parity, and number of fetuses. They found a higher

incidence of gestational hypertension if the oocyte donor was unrelated to the recipient (20 % vs. 3.7 % for standard IVF; $p<0.03$), than if the donor was a sibling (8 % vs. 3.7 % for standard IVF; $p<0.31$) [179]. Additionally, there is evidence that disorders of placental implantation are higher in all IVF pregnancies and may be even higher in DE pregnancies [9, 145]. Esh-Broder et al., in a retrospective chart review of 25,193 deliveries, studied the association between PA and IVF pregnancies, reporting a higher rate of PA in IVF when compared to non-IVF pregnancies (16/1,000 vs. 1.2/1,000, respectively; $p<0.0001$; OR 13.2; 95 % CI 6.7–25.8) [180]. The risk of placenta accreta (PA) seems to be further increased in donor pregnancies, secondary to disproportionate placental invasion [9, 145]

Operative Delivery

It is well known that IVF pregnancies carry an increased likelihood of cesarean delivery and, similarly, that these rates have been found to be increased in DE pregnancies as well, with rates varying between 40 and 76 % [4, 6, 9, 138, 140–142, 145, 146, 181]. There are many factors that may be implicated in the higher rate of cesareans that range from higher rate of complications in donors to inherent confounders found in this group, such as advanced age.

Ectopic Pregnancy

The reported rate of ectopic pregnancy in autologous IVF/ET cycles is 2–5 % and it is dependent on associated risk factors, especially the presence of tubal factor infertility and use of several ART methodologies (i.e., assisted hatching, cryopreserved embryos, higher associated transfer volume, and number of transferred embryos) [182–191]. Donor oocyte recipients may have a lower incidence than the autologous IVF/ET population [188–192]. If so, the lower incidence is probably due to a lower incidence of tubal disease. Clayton et al. reported a significantly lower ectopic pregnancy rate in the non-cryopreserved donor pregnancies than in the non-donor IVF/ET population (1.4 % vs. 2.2 %; OR 0.63, 95 % CI 0.54–0.75) [189]. Conversely, in an 8-year review comparing ectopic pregnancy rates in donor and non-donor IVF/ET recipients, Rosman et al. [192] reported a nonsignificant difference ($p=0.343$) in the ectopic pregnancy rate of 0.6 % versus 0.9 %, respectively, that was not changed when day 3 to day 5 embryo transfers were compared.

Fetal and Neonatal Complications

Most fetal and neonatal consequences seem to be secondary to maternal comorbidities (i.e., hypertension, gestational diabetes) or the ART process (i.e., multiple pregnancy), and, like most maternal complications, they may not be related the use of DE [7, 193]. There are several reports showing no increase in preterm delivery rates when donor recipients are compared to the general population [141, 142, 181]. Nonetheless Klatsky et al., in a retrospective, matched cohort study of 158 pregnancies comparing donor ($n=77$) to non-donor ($n=81$) pregnancies, found an increased rate of preterm delivery for donor recipients when compared to delivery time for women undergoing autologous IVF cycles (34 % vs. 19 %, respectively). This result was not changed by controlling for multiple gestations (OR 2.6, 95 % CI 1.04–6.3) [162]. This may further demonstrate the importance of confounders and selection of appropriate comparative groups. Further prospective studies are needed to clarify previous results.

Also, it appears that there is no connection between use of donor oocyte (with or without pregnancy-induced hypertension) and expected neonatal birth weight [141, 142, 146]. Several reports have demonstrated that the incidence of intrauterine growth restriction is not increased over that in the general population [141, 142]. When Soderstrom-Anttila et al. [142] evaluated the general health, growth, and development status of 126 children younger than 5 years of age from oocyte donation and non-donor IVF/ET pregnancies, they confirmed that the children were faring equally well. Even though donor pregnancies are associated with more complications than non-donor IVF/ET pregnancies, there is no apparent translation to children's general health [142].

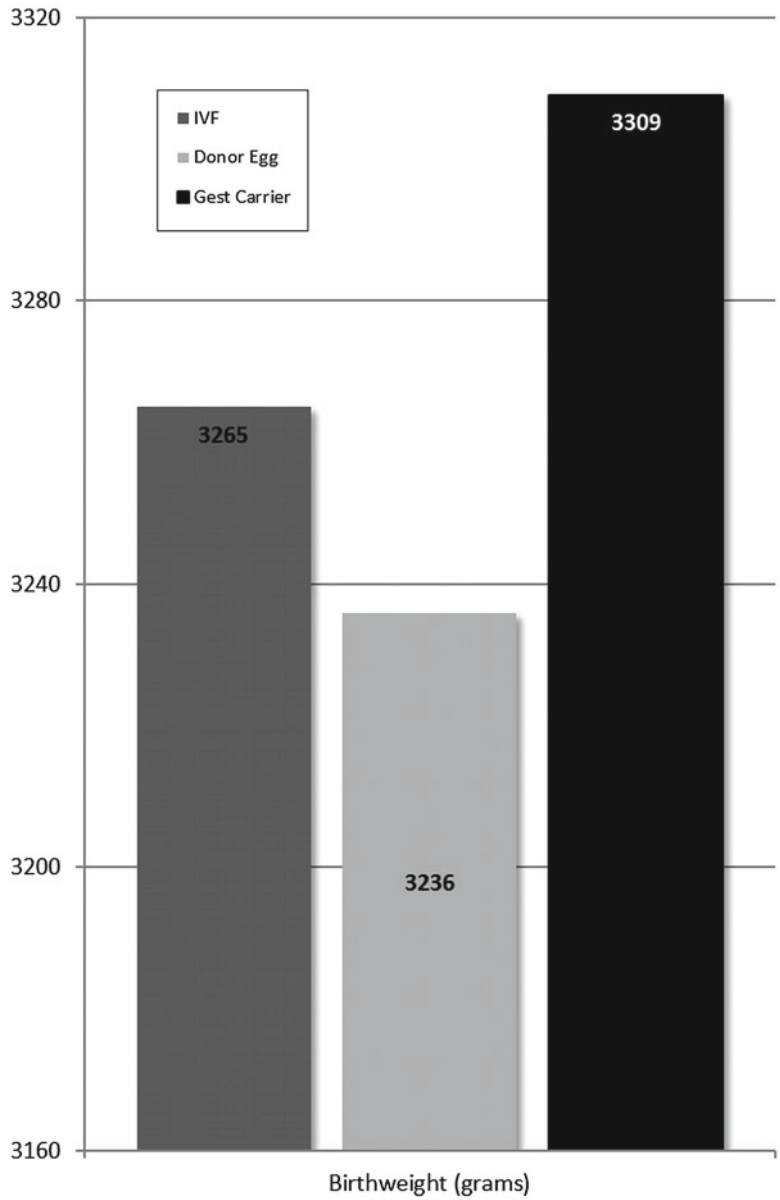

Fig. 1.4 Comparison of mean birth weight (in grams) of singleton infants born after the processes of routine IVF, use of donor oocyte, and use of gestational carriers

However, when Gibbons et al., for the SART Research Committee Writing Group, looked at the birth data on more than 70,000 singletons in the US data over 3 years, differences in birth weight (Fig. 1.4) and gestational age (Fig. 1.5) were observed between routine IVF pregnancies and donor egg pregnancies [194]. The mean birth weight of DE singletons was less than that of IVF pregnancies, and this difference was exacerbated when controlled for endometrial preparation (i.e., IVF pregnancies occurring after physiological estrogen/progesterone levels such as FET). The DE pregnancies produced statistically higher rates of low birth weight (<2,500 g) and very low birth weight (<1,500 g).

There are still no convincing data to prove an increase in the incidence of congenital malformations or chromosome abnormalities in offspring

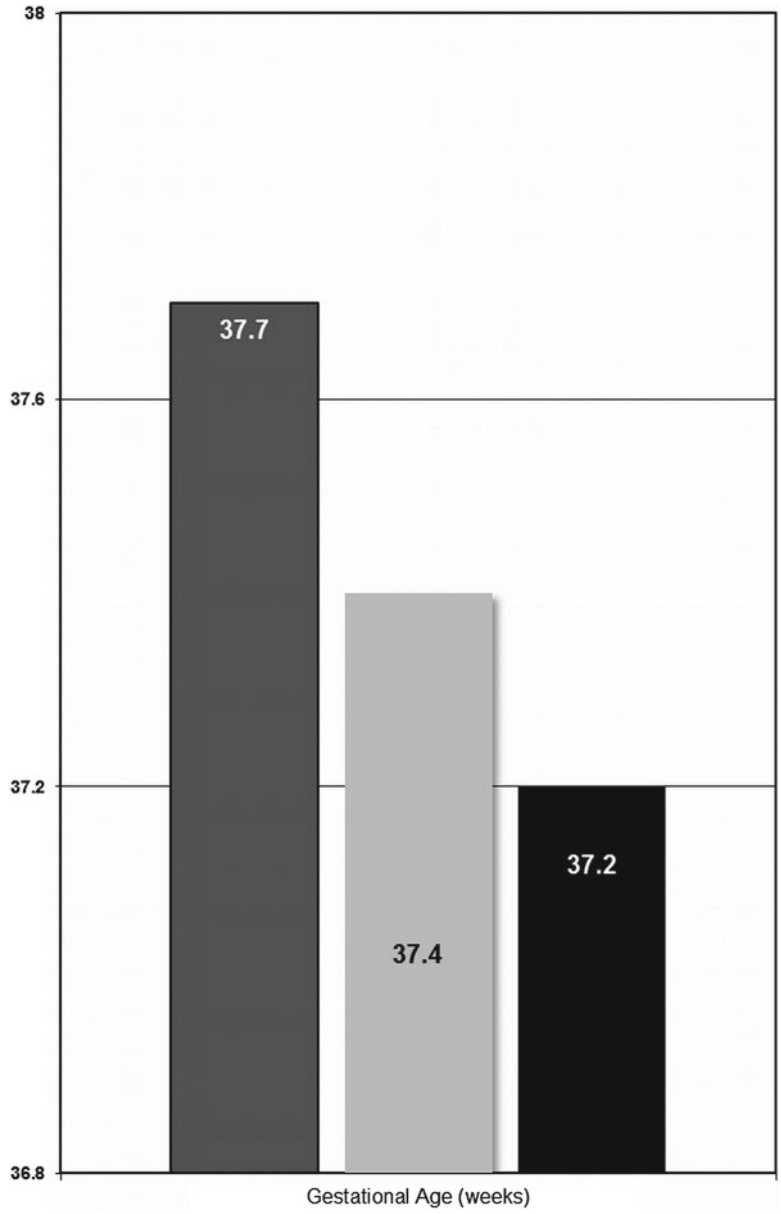

Fig. 1.5 Mean length of gestation between IVF, donor oocyte, and gestational carrier singleton pregnancies

from the donor egg process itself [9, 195–199]. Fragouli et al. assessed chromosome abnormalities in donors by analyzing 121 metaphase II oocytes and their corresponding first polar bodies donated by young women and found a 3 % aneuploidy rate, excluding increased frequency of meiosis I segregation errors in this cohort of patients [200]. This may be explained by the use of oocyte sources, mostly younger women that could offset the older women's complications during pregnancy. Treff et al. [201] have recently demonstrated that better and more consistent aneuploidy screening of these patients may be provided by the use of SNP microarray-based aneuploidy assays as opposed to fluorescence in situ hybridization (FISH). The group studied 13 arrested cleavage-stage embryos by both techniques ($n = 160$; FISH = 75 cells; SNP assay = 85

cells). The microarray technique provided significantly higher reliability (96 % vs. 83 %; $p=0.004$) and showed fewer mosaicisms (31 % vs. 100 %; $p=0.0005$) [201]. The absolute answer, if ART may be associated with an increase in malformations, has been addressed by Davies et al., who stated that this effect in IVF seems to be insignificant upon proper adjustment for parental factors. However, the same group noted an increased risk for birth defects in ICSI cycles that remained even after multivariate correction analysis that couldn't be excluded by unforeseen confounding factors [202]. It might be prudent to continue to monitor the results and their consequences of ever-evolving ART practices.

Long-Term Medical Implications

Classically, there are three main, possible long-term concerns associated with the use of donor oocytes in IVF/ET cycles: psychological (discussed elsewhere), impact on future fertility, and development of cancer [59].

Fertility

Women who decide to become donors should be counseled that the major factor that is known to affect fertility is age, with direct consequences on ovarian reserve and fertility outcomes. Only recently have data been found to answer questions about the implications of oocyte donation on future fertility. Current recommendations are that donors be less than 34 years of age and have excellent ovarian reserve, in which case they may undergo repetitive oocyte donation cycles [23]. Some of the initial concerns were directed by the notion that the use of COH cycles and oocyte harvesting would exhaust the quantity and interfere with the quality of the remaining pool of oocytes available in donors. The current data do not suggest that there is a compromise of the donor's future fertility. The process of COH uses gonadotropins to induce development of oocytes to an antral stage and beyond, from an originating pool of preselected primordial oocytes. This implies that COH will not affect the permanent pool of primordial oocytes, arrested in the first meiotic division, or the cohort of these oocytes that will undergo cycle activation and senescence and is gonadotropin independent. In addition, there is not sufficient evidence to suggest that induced atresia of primordial follicles ensues because of the LH and FSH used in COH. The current data offer a compelling argument that repeated donation does not affect future fertility as previously thought. The ability to retrieve oocytes and ovarian function markers (AMH) and the future fertility rates were not affected by as many as six consecutive oocyte donations. Current recommendations mention six as the upper limit of consecutive oocyte donations. Bukulmez et al., in a retrospective cohort study, found no significant decline in ovarian responsiveness between donation cycles 1 and 7. Furthermore, the ovarian reserve marker AMH was found to have no significant decline [54]. We believe on the basis of currently available data that oocyte donation does not seem to impact donor fertility, although ongoing surveillance of egg donors is warranted to confirm this notion.

For example, although it has not at all been proven, it has been hypothesized that trauma to the ovarian tissue could possibly cause depletion of the oocyte pool, although this has never been proven [52, 203]. Trauma to the ovary has been thought to potentially compromise the vascular system, either inducing premature fibrosis, replacing normal stroma, or producing autoantibodies. The hypothesis is that repeated retrieval could possibly compromise ovarian hilum vasculature and induce fibrotic changes that would consequently reduce the pool of available oocytes. In addition, women undergoing oocyte retrieval have been found to have increased ovarian and serum concentrations of anti-ovary antibodies that previously have been linked to the increase in the rate of IVF failure, although their significance is largely unknown [203]. Infection and adhesion formation could affect future fertility, but there is little evidence to that effect since they seem to be extremely infrequent events following IVF/ET cycles.

Oncology

One of the most feared complications for both donors and recipients is development of cancer as a consequence of undergoing fertility treatments. Two different sets of patients should be considered. The first is made up of the fertile healthy (except perhaps for an inheritable disease) donors and recipients with no previous use of ARTs. The second group is made up of women with previous subfertility who are undergoing shared-IVF/ET cycles or are recipients who have failed multiple previous ART cycles. This latter group may be regarded as having a higher baseline risk profile for certain cancers. The main cancer types that seem to be involved are hormone-modulated or hormone-responsive types such as breast, endometrial, ovarian, thyroid, and skin (i.e., melanoma) cancers. The use of hormonal stimulation protocols using gonadotropins is associated with supraphysiologic estradiol levels and the potential to enhance malignant transformation in the susceptible tissues mentioned above.

Breast cancer is the most common cancer among women and is frequently responsive to both estrogen and progesterone. Earlier reports on the use of clomiphene citrate were indicative of its potential association with breast cancer. Brinton et al., in a retrospective cohort study of 12,193 women followed for more than 20 years to evaluate infertility, found no significant increase in breast cancer risk with the use of either clomiphene or gonadotropins (RR = 1.39 and 1.54, respectively). Nevertheless, the group found a statistically significant increase in the subset with invasive breast cancer development and the use of clomiphene (RR = 1.60, 95 % CI 1.0–2.5) [204]. Similarly, Lerner-Geva et al., in a prospective cohort and nested case–control of 5,788 patients, found a similar association between clomiphene and breast cancer (OR = 2.7, 95 % CI 1.3–5.7) [205]. An earlier study conducted by Potashnik et al., in a long-term, historic-prospective study, reviewed the cases of 1,197 infertile women representing 21,407 person–years and found a significant increase in breast cancers only in the subpopulation exposed to low-dose clomiphene citrate (standardized incidence ratio, 1.65 [95 % CI 0.94–2.68]) [206]. Additionally Orgeas et al., in a prospective cohort study of 1,135 women undergoing fertility treatment and followed for 16 years, found a nearly twofold increase in the risk of breast cancer with the use of high-dose clomiphene citrate. In women with non-ovulatory infertility factors, the increase in risk was threefold (standardized incidence ratios, 1.90 [95 % CI 1.08–3.35] and 3.00 [95 % CI 1.35–6.67], respectively) [207]. Neither Potashnik nor Orgeas found an overall increase for breast cancer. It is important to understand that clomiphene citrate, a tamoxifen-related molecular structure, is a selective estrogen receptor modulator that increases estradiol levels and is known to interfere with the risk of other cancers, depending on the locations and mode of action (bone vs. endometrium epithelium). For instance, tamoxifen is used in menopausal women and in hormone-responsive breast cancers (i.e., positive estrogen/progesterone receptors), although it is related to an increased risk for endometrial adenocarcinoma and uterine sarcoma. Even though Burkman et al., in a multicenter case–control study, did not find an increased risk for developing breast cancer with the use of COH drugs, they identified a subgroup that had received hMG for more than 6 months, or for at least six cycles, with a 2.7–3.8 increased relative risk of breast cancer [208]. In contrast, Zreik et al. did not find a statistically significant risk for breast cancer with the use of gonadotropin therapy and, interestingly, found a lower risk of breast cancer with an increased number of clomiphene cycles ($P = 0.045$) [209].

Ovarian cancer is generally regarded as an aggressive gynecological cancer. As with other hormone-responsive cancers, an increased risk may be the consequence of the infertile status rather than the pharmacologic effect of drugs used in ART [210]. To this effect, Kashyap et al., in a meta-analysis on the relationship between ART and ovarian cancer, found a significantly higher risk for ovarian cancer in infertile patients than in the general population (1.52; 95 % CI 1.18–1.97). No such increase was demonstrated

when ART patients were compared with infertile controls (0.99; 95 % CI 0.67, 1.45). Furthermore, they demonstrated, in fact, a lower ovarian cancer risk in women treated with infertility drugs when compared with untreated infertile patients (0.67; CI 0.32, 1.41) [211]. We suggest that even though these women are exposed to short intervals of supraphysiologic hormonal levels during fertility treatments, they may have previously experienced chronic erratic hormonal patterns that potentially may be regularized by the treatment protocols (i.e., use of OCs, GnRH agonist protocols).

Endometrial cancer is the most common gynecological cancer and the fourth among all female cancers, with risk factors related to prolonged and unopposed estrogen exposure along with progesterone deficiencies (nulliparity, anovulation, late age menopause, obesity, polycystic ovary syndrome, and estrogen-secreting tumors). Some authors have reported a possible trend towards an increased risk for endometrial cancer. Modan et al. studied the risk of cancer in 2,496 infertile women undergoing fertility treatments and found an increased incidence of uterine cancer (21 vs. 4.3 expected cases; SIR = 4.85, 95 % CI 3.0–7.4), especially in women with progesterone deficiency and normal estrogen levels (SIR = 9.4, 95 % CI 5.0–16.0) [212]. By increasing estradiol levels, clomiphene citrate has been thought, like tamoxifen, to potentially increase the risk of endometrial cancer. In a retrospective cohort study by Althuis et al. 8,431 infertile women were reported to have a higher risk for uterine cancer associated with a dose-dependent use of clomiphene citrate, with the highest risk in nulligravidas and obese women (rate ratio [RR] = 1.79, 95 % CI 0.9, 3.4; RR = 3.49, 95 % CI 1.3, 9.3; RR = 6.02, 95 % CI 1.2, 30.0, respectively) [213]. The question remains: is it the medication or the anovulation resulting in this population using the drug? Contrary to previous findings, Ron et al. and Venn et al. did not find an association between uterine cancer and ART treatments [210, 214]. At present, there are only a few reports on these possible associations, and additional studies are needed.

We conclude by stating that even though early studies suggested an association between COH drugs and an increased risk in certain malignancies, current data do not support this linear assumption, considering that the infertility status rather than the treatment seems to increase the risk of ovarian and breast cancer.

Conclusion

There is at present sufficient evidence in the literature to suggest the relative safety of oocyte donation, although the use of another individual's genetic material for reproduction may have potential medical implications for both donor and recipient. Paramount is the prevention of all possible risks and complications inherent in the reproductive method, in both the short and the long term. We advocate that the most important part of the complex donor process is the ability for a specialized group of skilled healthcare professionals to properly screen potential participants, provide adequate informed consent, and accompany these women throughout the initial process and beyond.

In addition, there is a need for further clarification to allay previous fears and concerns in order to counsel and guide participants. To this end, we recommend that each institution should develop additional follow-up programs and track health systems of the participants in their donor programs. This could be coordinated with already-established national registries and databases, always with the anonymity of their participants secured, to increase the power of future comparative studies and unmask potential confounders and unforeseen risks.

One of the major issues in most donation programs is the demand that is disproportional to the availability of donors. Several solutions have been devised, from the use of shared and anonymous donors to the creation of donor banks. The use of new cryopreservation techniques may increase the feasibility of storage and use of oocytes that would otherwise be discarded. Added to all of these issues are social pressures. On the one hand

is the concern by legislatures that women are being coerced into donation by excessive reimbursement, balanced by considerations of laws that probably would decrease availability of donors. Added to these concerns is a class-action suit against all current ART programs in the USA, attempting to gain agreement to guidelines placing a ceiling on reimbursement that, if successful, could make the donor process too expensive for many infertile couples to afford until a new balance of supply and demand is reached.

Our ongoing effort is to learn more about the genetic and other factors that lead women to need donor eggs and to help understand the biology of the effects in obstetrical outcomes.

References

1. Bustillo M, Buster JE, Cohen SW, Thorneycroft IH, Simon JA, Boyers SP, et al. Nonsurgical ovum transfer as a treatment in infertile women. Preliminary experience. JAMA. 1984;251(9):1171–3.
2. Buster JE, Bustillo M, Thorneycroft IH, Simon JA, Boyers SP, Marshall JR, et al. Non-surgical transfer of in vivo fertilised donated ova to five infertile women: report of two pregnancies. Lancet. 1983; 2(8343):223–4.
3. Lutjen P, Trounson A, Leeton J, Findlay J, Wood C, Renou P. The establishment and maintenance of pregnancy using in vitro fertilization and embryo donation in a patient with primary ovarian failure. Nature. 1984;307(5947):174–5.
4. Kavic SM, Sauer MV. Oocyte donation treats infertility in survivors of malignancies: ten-year experience. J Assist Reprod Genet. 2001;18(3):181–3.
5. Sauer MV, Paulson RJ. Consecutive pregnancies in a menopausal woman following oocyte donation. Gynecol Obstet Invest. 1991;32(2):118–20.
6. Klein J, Sauer MV. Oocyte donation. Best Pract Res Clin Obstet Gynaecol. 2002;16(3):277–91.
7. Pados G, Camus M, Van Steirteghem A, Bonduelle M, Devroey P. The evolution and outcome of pregnancies from oocyte donation. Hum Reprod. 1994; 9(3):538–42.
8. Paulson RJ, Hatch IE, Lobo RA, Sauer MV. Cumulative conception and live birth rates after oocyte donation: implications regarding endometrial receptivity. Hum Reprod. 1997;12(4):835–9.
9. van der Hoorn ML, Lashley EE, Bianchi DW, Claas FH, Schonkeren CM, Scherjon SA. Clinical and immunologic aspects of egg donation pregnancies: a systematic review. Hum Reprod Update. 2010;16(6): 704–12.
10. Borini A, Bafaro MG, Bianchi L, Violini F, Bonu MA, Flamigni C. Oocyte donation programme: results obtained with intracytoplasmic sperm injection in cases of severe male factor infertility or previous failed fertilization. Hum Reprod. 1996;11(3):548–50.
11. Borini A, Bianchi L, Violini F, Maccolini A, Cattoli M, Flamigni C. Oocyte donation program: pregnancy and implantation rates in women of different ages sharing oocytes from single donor. Fertil Steril. 1996;65(1):94–7.
12. Stolwijk AM, Zielhuis GA, Sauer MV, Hamilton CJ, Paulson RJ. The impact of the woman's age on the success of standard and donor in vitro fertilization. Fertil Steril. 1997;67(4):702–10.
13. Soares SR, Troncoso C, Bosch E, Serra V, Simon C, Remohi J, et al. Age and uterine receptiveness: predicting the outcome of oocyte donation cycles. J Clin Endocrinol Metab. 2005;90(7):4399–404.
14. Paulson RJ, Boostanfar R, Saadat P, Mor E, Tourgeman DE, Slater CC, et al. Pregnancy in the sixth decade of life: obstetric outcomes in women of advanced reproductive age. JAMA. 2002;288(18): 2320–3.
15. van Kasteren YM, Schoemaker J. Premature ovarian failure: a systematic review on therapeutic interventions to restore ovarian function and achieve pregnancy. Hum Reprod Update. 1999;5(5):483–92.
16. Coulam CB. Premature gonadal failure. Fertil Steril. 1982;38(6):645–55.
17. Chatterjee S, Modi D, Maitra A, Kadam S, Patel Z, Gokrall J, et al. Screening for FOXL2 gene mutations in women with premature ovarian failure: an Indian experience. Reprod Biomed Online. 2007; 15(5):554–60.
18. Coulam CB, Adamson SC, Annegers JF. Incidence of premature ovarian failure. Obstet Gynecol. 1986;67(4):604–6.
19. Practice Committees of American Society for Reproductive Medicine; Society for Assisted Reproductive Technology. Mature oocyte cryopreservation: a guideline. Fertil Steril. 2013;99(1): 37–43.
20. Chevalier N, Bstandig B, Galand-Portier M, Isnard V, Bongain A, Fenichel P. Procreation par don d'ovocytes dans le syndrome de Turner: une situation a haut risque. [Oocyte donation in patients with Turner syndrome: A high-risk pregnancy]. Ann Endocrinol (Paris). 2009;70(4):246–51.
21. Fenichel P, Letur H. Procreation et syndrome de Turner: quelles recommandations avant, pendant et apres la grossesse? [Procreation in Turner's syndrome: which recommendations before, during and after pregnancy?]. Gynecol Obstet Fertil. 2008; 36(9):891–7.
22. Practice Committee of American Society For Reproductive Medicine. Increased maternal cardiovascular mortality associated with pregnancy in women with Turner syndrome. Fertil Steril. 2012;97(2):282–4.

23. Practice Committee of American Society for Reproductive Medicine; Practice Committee of Society for Assisted Reproductive Technology. Recommendations for gamete and embryo donation: a committee opinion. Fertil Steril. 2013;99(1):47–62 e1.
24. Trounson A, Leeton J, Besanko M, Wood C, Conti A. Pregnancy established in an infertile patient after transfer of a donated embryo fertilised in vitro. Br Med J (Clin Res Ed). 1983;286(6368):835–8. The fertilization and transfer of a donated embryo. The recipient, whose husband was infertile, became pregnant after receiving a donor ovum fertilized with donor sperm. The ovum donor, also under treatment for infertility, failed to conceive after three ova fertilized by her husband's sperm were re-implanted. The procedures used in the treatment of both women are outlined, and the possible reasons for the recipient's spontaneous abortion and the donor's failure to conceive are discussed. Also touched upon are the ethical, legal, and psychological implications of using donor material to achieve pregnancy.
25. Rosenwaks Z. Donor eggs: their application in modern reproductive technologies. Fertil Steril. 1987;47(6):895–909.
26. Devroey P, Camus M, van den Abbeel E, van Waesberghe L, Wisanto A, van Steirteghem AC. Establishment of 22 pregnancies after oocyte and embryo donation. Br J Obstet Gynaecol. 1989; 96(8):900–6.
27. Van SA, Pados G, Devroey P, Bonduelle M, Van AE, Liebaers I. Oocyte donation for genetic indications. Reprod Fertil Dev. 1992;4(6):681–8.
28. ESHRE Task Force on Ethics and Law. III. Gamete and embryo donation. Hum Reprod. 2002; 17(5):1407–8.
29. Jones Jr HW, Cooke I, Kempers R, Brinsden P, Saunders D. International Federation of Fertility Societies Surveillance 2010: preface. Fertil Steril. 2011;95(2):491.
30. Shenfield F, Pennings G, Cohen J, Devroey P, Tarlatzis B. Taskforce 9: the application of preimplantation genetic diagnosis for human leukocyte antigen typing of embryos. Hum Reprod. 2005; 20(4):845–7.
31. ESHRE Task Force on Ethics and Law. Taskforce 7: Ethical considerations for the cryopreservation of gametes and reproductive tissues for self use. Hum Reprod. 2004;19(2):460–2.
32. Pennings G, de Wert G, Shenfield F, Cohen J, Tarlatzis B, Devroey P. ESHRE Task Force on Ethics and Law 12: oocyte donation for non-reproductive purposes. Hum Reprod. 2007;22(5):1210–3.
33. Pennings G, de Wert G, Shenfield F, Cohen J, Devroey P, Tarlatzis B. ESHRE Task Force on Ethics and Law 11: posthumous assisted reproduction. Hum Reprod. 2006;21(12):3050–3.
34. Shenfield F, Pennings G, Cohen J, Devroey P, de Wert G, Tarlatzis B. ESHRE Task Force on Ethics and Law 10: surrogacy. Hum Reprod. 2005;20(10): 2705–7.
35. Cobo A, Meseguer M, Remohi J, Pellicer A. Use of cryo-banked oocytes in an ovum donation programme: a prospective, randomized, controlled, clinical trial. Hum Reprod. 2010;25(9):2239–46.
36. Mertes H, Pennings G. Oocyte donation for stem cell research. Hum Reprod. 2007;22(3):629–34.
37. Nelissen EC, van Montfoort AP, Dumoulin JC, Evers JL. Epigenetics and the placenta. Hum Reprod Update. 2011;17(3):397–417.
38. Garcia JI, Noriega-Portella L, Noriega-Hoces L. Efficacy of oocyte vitrification combined with blastocyst stage transfer in an egg donation program. Hum Reprod. 2011;26(4):782–90.
39. Simchen MJ, Shulman A, Wiser A, Zilberberg E, Schiff E. The aged uterus: multifetal pregnancy outcome after ovum donation in older women. Hum Reprod. 2009;24(10):2500–3.
40. Practice Committee of American Society for Reproductive Medicine; Practice Committee of Society for Assisted Reproductive Technology. 2008 Guidelines for gamete and embryo donation: A Practice Committee report. Fertil Steril. 2008;90(5 Suppl):S30–44. PubMed PMID: 19007645. Epub 2008/11/26. eng.
41. Lindheim SR, Sauer MV. Upper genital-tract screening with hysterosonography in patients receiving donated oocytes. Int J Gynaecol Obstet. 1998;60(1): 47–50.
42. Moomjy M, Mangieri R, Beltramone F, Cholst I, Veeck L, Rosenwaks Z. Shared oocyte donation: society's benefits. Fertil Steril. 2000;73(6):1165–9.
43. Glujovsky D, Fiszbajn G, Lipowicz R, Lavolpe M, Sueldo C. Practice of sharing donated oocytes among several recipients. Fertil Steril. 2006;86(6): 1786–8.
44. Blyth E. Subsidized IVF: the development of 'egg sharing' in the United Kingdom. Hum Reprod. 2002;17(12):3254–9.
45. Reh AE, Licciardi F, Krey L, Berkeley A, Kump L. Enhanced screening of prospective oocyte donors: a ten-year review. Fertil Steril. 2008;90:S384.
46. Mullin CM, Fino ME, Talebian S, Keegan D, Grifo JA, Licciardi F. Comparison of pregnancy outcomes in anonymous shared versus exclusive donor oocyte in vitro fertilization cycles. Fertil Steril. 2010; 93(2):574–8.
47. Ethics Committee, American Society for Reproductive Medicine. Family members as gamete donors and surrogates. Fertil Steril. 2003;80(5): 1124–30.
48. Ethics Committee of the American Society for Reproductive Medicine. Financial incentives in recruitment of oocyte donors. Fertil Steril. 2004;82 Suppl 1:S240–4.
49. Keehn J, Holwell E, Abdul-Karim R, Chin LJ, Leu CS, Sauer MV, et al. Recruiting egg donors online: an analysis of in vitro fertilization clinic and agency websites' adherence to American Society for Reproductive Medicine guidelines. Fertil Steril. 2012;98(4):995–1000.

50. Zenke U, Chetkowski RJ. Inclusion of heterozygotes for cystic fibrosis in the egg donor pool. Fertil Steril. 2002;78(3):557–61.
51. Hamer FC, Horne G, Pease EH, Matson PL, Lieberman BA. The quarantine of fertilized donated oocytes. Hum Reprod. 1995;10(5):1194–6.
52. Serna J, Garcia-Velasco JA. Effect of repeated assisted reproduction techniques on the ovarian response. Curr Opin Obstet Gynecol. 2005;17(3): 233–6.
53. Caligara C, Navarro J, Vargas G, Simon C, Pellicer A, Remohi J. The effect of repeated controlled ovarian stimulation in donors. Hum Reprod. 2001; 16(11):2320–3.
54. Bukulmez O, Li Q, Carr BR, Leader B, Doody KM, Doody KJ. Repetitive oocyte donation does not decrease serum anti-Müllerian hormone levels. Fertil Steril. 2010;94(3):905–12.
55. Cobo A, Diaz C. Clinical application of oocyte vitrification: a systematic review and meta-analysis of randomized controlled trials. Fertil Steril. 2011; 96(2):277–85.
56. Kuwayama M, Vajta G, Kato O, Leibo SP. Highly efficient vitrification method for cryopreservation of human oocytes. Reprod Biomed Online. 2005; 11(3):300–8.
57. Cobo A, Bellver J, Domingo J, Perez S, Crespo J, Pellicer A, et al. New options in assisted reproduction technology: the Cryotop method of oocyte vitrification. Reprod Biomed Online. 2008;17(1):68–72.
58. Van Landuyt L, Stoop D, Verheyen G, Verpoest W, Camus M, Van de Velde H, et al. Outcome of closed blastocyst vitrification in relation to blastocyst quality: evaluation of 759 warming cycles in a single-embryo transfer policy. Hum Reprod. 2011;26: 527–34.
59. Giudice L, Santa E, Pool R. Assessing the medical risks of human oocyte donation for stem cell research: Workshop report. Washington, DC: The National Academies Press; 2007.
60. Bodri D, Guillen JJ, Galindo A, Mataro D, Pujol A, Coll O. Triggering with human chorionic gonadotropin or a gonadotropin-releasing hormone agonist in gonadotropin-releasing hormone antagonist-treated oocyte donor cycles: findings of a large retrospective cohort study. Fertil Steril. 2009;91(2):365–71.
61. Shapiro BS, Daneshmand ST, Garner FC, Aguirre M, Ross R. Comparison of human chorionic gonadotropin and gonadotropin-releasing hormone agonist for final oocyte maturation in oocyte donor cycles. Fertil Steril. 2007;88(17296193):237–9.
62. Acevedo B, Gomez-Palomares JL, Ricciarelli E, Hernandez ER. Triggering ovulation with gonadotropin-releasing hormone agonists does not compromise embryo implantation rates. Fertil Steril. 2006;86(1):1682–7.
63. Morris RS, Paulson RJ, Sauer MV, Lobo RA. Predictive value of serum oestradiol concentrations and oocyte number in severe ovarian hyperstimulation syndrome. Hum Reprod. 1995;10(4):811–4.
64. Babayof R, Margalioth EJ, Huleihel M, Amash A, Zylber-Haran E, Gal M, et al. Serum inhibin A, VEGF and TNFalpha levels after triggering oocyte maturation with GnRH agonist compared with HCG in women with polycystic ovaries undergoing IVF treatment: a prospective randomized trial. Hum Reprod. 2006;21(5):1260–5.
65. Engmann L, DiLuigi A, Schmidt D, Benadiva C, Maier D, Nulsen J. The effect of luteal phase vaginal estradiol supplementation on the success of in vitro fertilization treatment: a prospective randomized study. Fertil Steril. 2008;89(3):554–61.
66. Sauer MV. Defining the incidence of serious complications experienced by oocyte donors: a review of 1000 cases. Am J Obstet Gynecol. 2001;184(3): 277–8.
67. Halme J, Toma SK, Talbert LM. A case of severe ovarian hyperstimulation in a healthy oocyte donor. Fertil Steril. 1995;64(4):857–9.
68. Bodri D, Guillén JJ, Polo A, Trullenque M, Esteve C, Coll O. Complications related to ovarian stimulation and oocyte retrieval in 4052 oocyte donor cycles. Reprod Biomed Online. 2008;17(2):237–43.
69. Sauer MV, Paulson RJ. Mishaps and misfortunes: complications that occur in oocyte donation. Fertil Steril. 1994;61(5):963–5.
70. Reissmann T, Felberbaum R, Diedrich K, Engel J, Comaru-Schally AM, Schally AV. Development and applications of luteinizing hormone-releasing hormone antagonists in the treatment of infertility: an overview. Hum Reprod. 1995;10(8):1974–81.
71. Craft I, Gorgy A, Hill J, Menon D, Podsiadly B. Will GnRH antagonists provide new hope for patients considered 'difficult responders' to GnRH agonist protocols? Hum Reprod. 1999;14(2):2959–62.
72. Bodri D, Sunkara SK, Coomarasamy A. Gonadotropin-releasing hormone agonists versus antagonists for controlled ovarian hyperstimulation in oocyte donors: a systematic review and meta-analysis. Fertil Steril. 2011;95(1):164–9.
73. Thong KJ, Yong PY, Menezes Q. The administration of the GnRH antagonist, cetrorelix, to oocyte donors simplifies oocyte donation. Hum Reprod. 2003; 18(6):1256–8.
74. Sauer MV, Paulson RJ, Lobo RA. Comparing the clinical utility of GnRH antagonist to GnRH agonist in an oocyte donation program. Gynecol Obstet Invest. 1997;43(4):215–8.
75. Al-Inany H, Aboulghar M (2001) Gonadotrophin-releasing hormone antagonists for assisted conception. Cochrane Datab Syst Rev (Online) 4:CD001750.
76. Leeton J, Chan LK, Trounson A, Harman J. Pregnancy established in an infertile patient after transfer of an embryo fertilized in vitro where the oocyte was donated by the sister of the recipient. J In Vitro Fert Embryo Transf. 1986;3(6):379–82.
77. Navot D, Anderson TL, Droesch K, Scott RT, Kreiner D, Rosenwaks Z. Hormonal manipulation of endometrial maturation. J Clin Endocrinol Metab. 1989;68(4):801–7.

78. Glujovsky D, Pesce R, Fiszbajn G, Sueldo C, Hart RJ, Ciapponi A (2010) Endometrial preparation for women undergoing embryo transfer with frozen embryos or embryos derived from donor oocytes. Cochrane Database Syst Rev (Online) (1):CD006359.
79. Devroey P, Pados G. Preparation of endometrium for egg donation. Hum Reprod Update. 1998;4(6): 856–61.
80. Grzegorczyk-Martin V, Mayenga JM, Kulski O, Belaid Y, Grefenstette I, Belaisch-Allart J. Preparation endometriale chez les receveuses dans un programme de don d'ovocytes. [Endometrial preparation in oocyte recipients]. Gynecol Obstet Fertil. 2012;40(9):507–10.
81. Lelaidier C, de Ziegler D, Gaetano J, Hazout A, Fernandez H, Frydman R. Controlled preparation of the endometrium with exogenous oestradiol and progesterone: a novel regimen not using a gonadotrophin-releasing hormone agonist. Hum Reprod. 1992;7(10):1353–6.
82. Adams SM, Gayer N, Terry V, Murphy CR. Manipulation of the follicular phase: Uterodomes and pregnancy—is there a correlation? BMC Pregnancy Childbirth. 2001;1(1):2.
83. Borini A, Dal Prato L, Bianchi L, Violini F, Cattoli M, Flamigni C. Effect of duration of estradiol replacement on the outcome of oocyte donation. J Assist Reprod Genet. 2001;18(4):185–90.
84. Noyes N, Hampton BS, Berkeley A, Licciardi F, Grifo J, Krey L. Factors useful in predicting the success of oocyte donation: a 3-year retrospective analysis. Fertil Steril. 2001;76(1):92–7.
85. Ryan KJ, Engel LL. The interconversion of estrone and estradiol by human tissue slices. Endocrinology. 1953;52(3):287–91.
86. Remohi J, Vidal A, Pellicer A. Oocyte donation in low responders to conventional ovarian stimulation for in vitro fertilization. Fertil Steril. 1993;59(6): 1208–15.
87. Ben-Nun I, Shulman A. Induction of artificial endometrial cycles with s.c. oestrogen implants and injectable progesterone in in-vitro fertilization treatment with donated oocytes: a preliminary report. Hum Reprod. 1997;12(10):2267–70.
88. Mandel FP, Geola FL, Meldrum DR, Lu JH, Eggena P, Sambhi MP, et al. Biological effects of various doses of vaginally administered conjugated equine estrogens in postmenopausal women. J Clin Endocrinol Metab. 1983;57(1):133–9.
89. Stumpf PG, Maruca J, Santen RJ, Demers LM. Development of a vaginal ring for achieving physiologic levels of 17 beta-estradiol in hypoestrogenic women. J Clin Endocrinol Metab. 1982;54(1): 208–10.
90. Powers MS, Schenkel L, Darley PE, Good WR, Balestra JC, Place VA. Pharmacokinetics and pharmacodynamics of transdermal dosage forms of 17 beta-estradiol: comparison with conventional oral estrogens used for hormone replacement. Am J Obstet Gynecol. 1985;152(8):1099–106.
91. Escriba MJ, Bellver J, Bosch E, Sanchez M, Pellicer A, Remohi J. Delaying the initiation of progesterone supplementation until the day of fertilization does not compromise cycle outcome in patients receiving donated oocytes: a randomized study. Fertil Steril. 2006;86(1):92–7.
92. Bourgain C, Devroey P, Van Waesberghe L, Smitz J, Van Steirteghem AC. Effects of natural progesterone on the morphology of the endometrium in patients with primary ovarian failure. Hum Reprod. 1990;5(5):537–43.
93. Miles RA, Paulson RJ, Lobo RA, Press MF, Dahmoush L, Sauer MV. Pharmacokinetics and endometrial tissue levels of progesterone after administration by intramuscular and vaginal routes: a comparative study. Fertil Steril. 1994;62(3): 485–90.
94. Gibbons WE, Toner JP, Hamacher P, Kolm P. Experience with a novel vaginal progesterone preparation in a donor oocyte program. Fertil Steril. 1998;69(1):96–101.
95. Jobanputra K, Toner JP, Denoncourt R, Gibbons WE. Crinone 8 % (90 mg) given once daily for progesterone replacement therapy in donor egg cycles. Fertil Steril. 1999;72(6):980–4.
96. Zhang X, Chen CH, Confino E, Barnes R, Milad M, Kazer RR. Increased endometrial thickness is associated with improved treatment outcome for selected patients undergoing in vitro fertilization-embryo transfer. Fertil Steril. 2005;83(2):336–40.
97. Weissman A, Gotlieb L, Casper RF. Endocrine function in transplanted ovaries? Fertil Steril. 1999; 71(2):385–7.
98. Dietterich C, Check JH, Choe JK, Nazari A, Lurie D. Increased endometrial thickness on the day of human chorionic gonadotropin injection does not adversely affect pregnancy or implantation rates following in vitro fertilization-embryo transfer. Fertil Steril. 2002; 77(4):781–6.
99. De Geyter C, Schmitter M, De Geyter M, Nieschlag E, Holzgreve W, Schneider HP. Prospective evaluation of the ultrasound appearance of the endometrium in a cohort of 1,186 infertile women. Fertil Steril. 2000;73(1):106–13.
100. Khalifa E, Brzyski RG, Oehninger S, Acosta AA, Muasher SJ. Sonographic appearance of the endometrium: the predictive value for the outcome of in-vitro fertilization in stimulated cycles. Hum Reprod. 1992;7(5):677–80.
101. Isaacs Jr JD, Wells CS, Williams DB, Odem RR, Gast MJ, Strickler RC. Endometrial thickness is a valid monitoring parameter in cycles of ovulation induction with menotropins alone. Fertil Steril. 1996;65(2):262–6.
102. Detti L, Yelian FD, Kruger ML, Diamond MP, Rode A, Mitwally MF, et al. Endometrial thickness is related to miscarriage rate, but not to the estradiol concentration, in cycles down-regulated with gonadotropin-releasing hormone antagonist. Fertil Steril. 2008;89(4):998–1001.

103. Friedler S, Schenker JG, Herman A, Lewin A. The role of ultrasonography in the evaluation of endometrial receptivity following assisted reproductive treatments: a critical review. Hum Reprod Update. 1996;2(4):323–35.
104. Check JH, Nowroozi K, Choe J, Lurie D, Dietterich C. The effect of endometrial thickness and echo pattern on in vitro fertilization outcome in donor oocyte-embryo transfer cycle. Fertil Steril. 1993; 59(1):72–5.
105. Elizur SE, Son WY, Yap R, Gidoni Y, Levin D, Demirtas E, et al. Comparison of low-dose human menopausal gonadotropin and micronized 17beta-estradiol supplementation in in vitro maturation cycles with thin endometrial lining. Fertil Steril. 2009;92(3):907–12.
106. Grifo JA, Noyes N. Delivery rate using cryopreserved oocytes is comparable to conventional in vitro fertilization using fresh oocytes: potential fertility preservation for female cancer patients. Fertil Steril. 2010;93(2):391–6.
107. Yang D, Brown SE, Nguyen K, Reddy V, Brubaker C, Winslow KL. Live birth after the transfer of human embryos developed from cryopreserved oocytes harvested before cancer treatment. Fertil Steril. 2007;87(6):1469 e1–4.
108. Yoon TK, Kim TJ, Park SE, Hong SW, Ko JJ, Chung HM, et al. Live births after vitrification of oocytes in a stimulated in vitro fertilization-embryo transfer program. Fertil Steril. 2003;79(6):1323–6.
109. Fabbri R, Porcu E, Marsella T, Rocchetta G, Venturoli S, Flamigni C. Human oocyte cryopreservation: new perspectives regarding oocyte survival. Hum Reprod. 2001;16(3):411–6.
110. Borini A, Sciajno R, Bianchi V, Sereni E, Flamigni C, Coticchio G. Clinical outcome of oocyte cryopreservation after slow cooling with a protocol utilizing a high sucrose concentration. Hum Reprod. 2006;21(2):512–7.
111. Oktay K, Cil AP, Bang H. Efficiency of oocyte cryopreservation: a meta-analysis. Fertil Steril. 2006; 86(1):70–80.
112. Porcu E, Fabbri R, Petracchi S, Ciotti PM, Flamigni C. Ongoing pregnancy after intracytoplasmic injection of testicular spermatozoa into cryopreserved human oocytes. Am J Obstet Gynecol. 1999;180(4): 1044–5.
113. Van Steirteghem AC, Van den Abbeel E, Camus M, Van Waesberghe L, Braeckmans P, Khan I, et al. Cryopreservation of human embryos obtained after gamete intra-Fallopian transfer and/or in-vitro fertilization. Hum Reprod. 1987;2(7):593–8.
114. Levi Setti PE, Albani E, Novara PV, Cesana A, Morreale G. Cryopreservation of supernumerary oocytes in IVF/ICSI cycles. Hum Reprod. 2006; 21(2):370–5.
115. Kuwayama M, Vajta G, Ieda S, Kato O. Comparison of open and closed methods for vitrification of human embryos and the elimination of potential contamination. Reprod Biomed Online. 2005;11(5):608–14.
116. Fahy GM, MacFarlane DR, Angell CA, Meryman HT. Vitrification as an approach to cryopreservation. Cryobiology. 1984;21(4):407–26.
117. Yoon TK, Lee DR, Cha SK, Chung HM, Lee WS, Cha KY. Survival rate of human oocytes and pregnancy outcome after vitrification using slush nitrogen in assisted reproductive technologies. Fertil Steril. 2007;88(4):952–6.
118. Vajta G, Nagy ZP. Are programmable freezers still needed in the embryo laboratory? Review on vitrification. Reprod Biomed Online. 2006;12(6): 779–96.
119. Selman H, Angelini A, Barnocchi N, Brusco GF, Pacchiarotti A, Aragona C. Ongoing pregnancies after vitrification of human oocytes using a combined solution of ethylene glycol and dimethyl sulfoxide. Fertil Steril. 2006;86(4):997–991000.
120. Nagy ZP, Chang C-C, Shapiro DB, Bernal DP, Elsner CW, Mitchell-Leef D, et al. Clinical evaluation of the efficiency of an oocyte donation program using egg cryo-banking. Fertil Steril. 2009;92(2):520–6.
121. Lucena E, Bernal DP, Lucena C, Rojas A, Moran A, Lucena A. Successful ongoing pregnancies after vitrification of oocytes. Fertil Steril. 2006;85(1):108–11.
122. Cobo A, Kuwayama M, Perez S, Ruiz A, Pellicer A, Remohi J. Comparison of concomitant outcome achieved with fresh and cryopreserved donor oocytes vitrified by the Cryotop method. Fertil Steril. 2008;89(6):1657–64.
123. Chian R-C, Huang JYJ, Tan SL, Lucena E, Saa A, Rojas A, et al. Obstetric and perinatal outcome in 200 infants conceived from vitrified oocytes. Reprod Biomed Online. 2008;16(5):608–10.
124. Antinori M, Licata E, Dani G, Cerusico F, Versaci C, Antinori S. Cryotop vitrification of human oocytes results in high survival rate and healthy deliveries. Reprod Biomed Online. 2007;14(1):72–9.
125. Nagy ZP, Chang C-C, Shapiro DB, Bernal DP, Elsner CW, Mitchell-Leef D, et al. Clinical evaluation of the efficiency of an oocyte donation program using egg cryo-banking. Fertil Steril. 2009;92(2):520–6.
126. Won HR, Abbott J. Optimal management of chronic cyclical pelvic pain: an evidence-based and pragmatic approach. Int J Womens Health. 2010; 2:263–77.
127. Ludwig M, Jelkmann W, Bauer O, Diedrich K. Prediction of severe ovarian hyperstimulation syndrome by free serum vascular endothelial growth factor concentration on the day of human chorionic gonadotrophin administration. Hum Reprod. 1999;14(10):2437–41.
128. Lee A, Christenson LK, Stouffer RL, Burry KA, Patton PE. Vascular endothelial growth factor levels in serum and follicular fluid of patients undergoing in vitro fertilization. Fertil Steril. 1997;68(2):305–11.
129. Agrawal R, Tan SL, Wild S, Sladkevicius P, Engmann L, Payne N, et al. Serum vascular endothelial growth factor concentrations in in vitro fertilization cycles predict the risk of ovarian hyperstimulation syndrome. Fertil Steril. 1999;71(2):287–93.

130. Bennett SJ, Waterstone JJ, Cheng WC, Parsons J. Complications of transvaginal ultrasound-directed follicle aspiration: a review of 2670 consecutive procedures. J Assist Reprod Genet. 1993;10(1):72–7.
131. Tureck RW, Garcia CR, Blasco L, Mastroianni Jr L. Perioperative complications arising after transvaginal oocyte retrieval. Obstet Gynecol. 1993;81(4):590–3.
132. Dicker D, Ashkenazi J, Feldberg D, Levy T, Dekel A, Ben-Rafael Z. Severe abdominal complications after transvaginal ultrasonographically guided retrieval of oocytes for in vitro fertilization and embryo transfer. Fertil Steril. 1993;59(6):1313–5.
133. Roest J, Mous HV, Zeilmaker GH, Verhoeff A. The incidence of major clinical complications in a Dutch transport IVF programme. Hum Reprod Update. 1996;2(4):345–53.
134. Govaerts I, Devreker F, Delbaere A, Revelard P, Englert Y. Short-term medical complications of 1500 oocyte retrievals for in vitro fertilization and embryo transfer. Eur J Obstet Gynecol Reprod Biol. 1998;77(2):239–43.
135. El-Toukhy T, Hanna L. Pelvic infection after oocyte retrieval: a preventable complication or an inevitable risk? J Obstet Gynaecol. 2006;26(7):701–3.
136. Ludwig AK, Glawatz M, Griesinger G, Diedrich K, Ludwig M. Perioperative and post-operative complications of transvaginal ultrasound-guided oocyte retrieval: prospective study of >1000 oocyte retrievals. Hum Reprod. 2006;21(12):3235–40.
137. El-Shawarby S, Margara R, Trew G, Lavery S. A review of complications following transvaginal oocyte retrieval for in-vitro fertilization. Hum Fertil (Cambridge, UK). 2004;7(2):127–33.
138. Blanchette H. Obstetric performance of patients after oocyte donation. Am J Obstet Gynecol. 1993;168(6 Pt 1):1803–7. discussion 7–9.
139. Serhal PF, Craft IL. Oocyte donation in 61 patients. Lancet. 1989;1(8648):1185–7.
140. Abdalla HI, Billett A, Kan AK, Baig S, Wren M, Korea L, et al. Obstetric outcome in 232 ovum donation pregnancies. Br J Obstet Gynaecol. 1998; 105(3):332–7.
141. Soderstrom-Anttila V, Tiitinen A, Foudila T, Hovatta O. Obstetric and perinatal outcome after oocyte donation: comparison with in-vitro fertilization pregnancies. Hum Reprod. 1998;13(2):483–90.
142. Soderstrom-Anttila V, Sajaniemi N, Tiitinen A, Hovatta O. Health and development of children born after oocyte donation compared with that of those born after in-vitro fertilization, and parents' attitudes regarding secrecy. Hum Reprod. 1998;13(7): 2009–15.
143. Salha O, Sharma V, Dada T, Nugent D, Rutherford AJ, Tomlinson AJ, et al. The influence of donated gametes on the incidence of hypertensive disorders of pregnancy. Hum Reprod. 1999;14(9):2268–73.
144. Wiggins DA, Main E. Outcomes of pregnancies achieved by donor egg in vitro fertilization–a comparison with standard in vitro fertilization pregnancies. Am J Obstet Gynecol. 2005;192(6):2002–6. discussion 6–8.
145. Sheffer-Mimouni G, Mashiach S, Dor J, Levran D, Seidman DS. Factors influencing the obstetric and perinatal outcome after oocyte donation. Hum Reprod. 2002;17(10):2636–40.
146. Sauer MV, Paulson RJ, Lobo RA. Rare occurrence of ovarian hyperstimulation syndrome in oocyte donors. Int J Gynaecol Obstet. 1996;52(3):259–62.
147. Krieg SA, Henne MB, Westphal LM. Obstetric outcomes in donor oocyte pregnancies compared with advanced maternal age in in vitro fertilization pregnancies. Fertil Steril. 2008;90(1):65–70.
148. Sauer MV, Paulson RJ, Lobo RA. Pregnancy after age 50: application of oocyte donation to women after natural menopause. Lancet. 1993;341(8841):321–3.
149. Sauer MV, Paulson RJ, Lobo RA. Pregnancy in women 50 or more years of age: outcomes of 22 consecutively established pregnancies from oocyte donation. Fertil Steril. 1995;64(1):111–5.
150. Budak E, Garrido N, Soares SR, Melo MA, Meseguer M, Pellicer A, et al. Improvements achieved in an oocyte donation program over a 10-year period: sequential increase in implantation and pregnancy rates and decrease in high-order multiple pregnancies. Fertil Steril. 2007;88(2):342–9.
151. Mirkin S, Gimeno TG, Bovea C, Stadtmauer L, Gibbons WE, Oehninger S. Factors associated with an optimal pregnancy outcome in an oocyte donation program. J Assist Reprod Genet. 2003;20(10): 400–8.
152. Knopman J, Krey LC, Lee J, Fino ME, Novetsky AP, Noyes N. Monozygotic twinning: an eight-year experience at a large IVF center. Fertil Steril. 2010;94(2):502–10.
153. Jackson RA, Gibson KA, Wu YW, Croughan MS. Perinatal outcomes in singletons following in vitro fertilization: a meta-analysis. Obstet Gynecol. 2004;103(3):551–63.
154. Schieve LA, Ferre C, Peterson HB, Macaluso M, Reynolds MA, Wright VC. Perinatal outcome among singleton infants conceived through assisted reproductive technology in the United States. Obstet Gynecol. 2004;103(15172846):1144–53.
155. Michalas S, Loutradis D, Drakakis P, Milingos S, Papageorgiou J, Kallianidis K, et al. Oocyte donation to women over 40 years of age: pregnancy complications. Eur J Obstet Gynecol Reprod Biol. 1996;64(2):175–8.
156. Simchen MJ, Yinon Y, Moran O, Schiff E, Sivan E. Pregnancy outcome after age 50. Obstet Gynecol. 2006;108(5):1084–8.
157. Henne MB, Zhang M, Paroski S, Kelshikar B, Westphal LM. Comparison of obstetric outcomes in recipients of donor oocytes vs. women of advanced maternal age with autologous oocytes. J Reprod Med. 2007;52(7):585–90.
158. Duley L. Maternal mortality associated with hypertensive disorders of pregnancy in Africa, Asia, Latin America and the Caribbean. Br J Obstet Gynaecol. 1992;99:547–53.
159. Sibai B, Dekker G, Kupferminc M. Pre-eclampsia. Lancet. 2005;365(9461):785–99.

160. Abdalla HI, Wren ME, Thomas A, Korea L. Age of the uterus does not affect pregnancy or implantation rates; a study of egg donation in women of different ages sharing oocytes from the same donor. Hum Reprod. 1997;12(4):827–9.
161. Porreco RP, Harden L, Gambotto M, Shapiro H. Expectation of pregnancy outcome among mature women. Am J Obstet Gynecol. 2005;192(1):38–41.
162. Klatsky PC, Delaney SS, Caughey AB, Tran ND, Schattman GL, Rosenwaks Z. The role of embryonic origin in preeclampsia: a comparison of autologous in vitro fertilization and ovum donor pregnancies. Obstet Gynecol. 2010;116(6):1387–92.
163. Redman CW, Sargent IL. Latest advances in understanding preeclampsia. Science (New York, NY). 2005;308(5728):1592–4.
164. Parham P. NK cells and trophoblasts: partners in pregnancy. J Exp Med. 2004;200(8):951–5.
165. Styer AK, Parker HJ, Roberts DJ, Palmer-Toy D, Toth TL, Ecker JL. Placental villitis of unclear etiology during ovum donor in vitro fertilization pregnancy. Am J Obstet Gynecol. 2003;189(4):1184–6.
166. Perni SC, Predanic M, Cho JE, Baergen RN. Placental pathology and pregnancy outcomes in donor and non-donor oocyte in vitro fertilization pregnancies. J Perinat Med. 2005;33(1):27–32.
167. Gundogan F, Bianchi DW, Scherjon SA, Roberts DJ. Placental pathology in egg donor pregnancies. Fertil Steril. 2010;93(2):397–404.
168. Lo YM, Leung TN, Tein MS, Sargent IL, Zhang J, Lau TK, et al. Quantitative abnormalities of fetal DNA in maternal serum in preeclampsia. Clin Chem. 1999;45(2):184–8.
169. Opelz G, Dohler B. Effect of human leukocyte antigen compatibility on kidney graft survival: comparative analysis of two decades. Transplantation. 2007;84(2):137–43.
170. Redman CW, Sargent IL. Immunology of preeclampsia. Am J Reprod Immunol. 2010;63(6):534–43.
171. Einarsson JI, Sangi-Haghpeykar H, Gardner MO. Sperm exposure and development of preeclampsia. Am J Obstet Gynecol. 2003;188(5):1241–3.
172. Liu L-P, Huang W, Lu Y-C, Liao A-H. Enhanced maternal anti-fetal immunity contributes to the severity of hypertensive disorder complicating pregnancy. Am J Reprod Immunol. 2010;63(5):379–86.
173. Robillard PY, Hulsey TC, Perianin J, Janky E, Miri EH, Papiernik E. Association of pregnancy-induced hypertension with duration of sexual cohabitation before conception. Lancet. 1994;344(8928):973–5.
174. Wang JX, Knottnerus A-M, Schuit G, Norman RJ, Chan A, Dekker GA. Surgically obtained sperm, and risk of gestational hypertension and pre-eclampsia. Lancet. 2002;359(9307):673–4.
175. Zhou CC, Ahmad S, Mi T, Abbasi S, Xia L, Day M-C, et al. Autoantibody from women with preeclampsia induces soluble Fms-like tyrosine kinase-1 production via angiotensin type 1 receptor and calcineurin/nuclear factor of activated T-cells signaling. Hypertension. 2008;51(4):1010–9.
176. Keegan DA, Krey LC, Chang HC, Noyes N. Increased risk of pregnancy-induced hypertension in young recipients of donated oocytes. Fertil Steril. 2007;87(4):776–81.
177. Li DK, Wi S. Changing paternity and the risk of preeclampsia/eclampsia in the subsequent pregnancy. Am J Epidemiol. 2000;151(1):57–62.
178. Saftlas AF, Levine RJ, Klebanoff MA, Martz KL, Ewell MG, Morris CD, et al. Abortion, changed paternity, and risk of preeclampsia in nulliparous women. Am J Epidemiol. 2003;157(12):1108–14.
179. Kim H, Yang K, Cha S, Song I, Kang I, (eds) (2005) Obstetric outcomes after oocyte donation in patients with premature ovarian failure. In: 21st Annual Meeting of the ESHRE, Copenhagen, Denmark.
180. Esh-Broder E, Ariel I, Abas-Bashir N, Bdolah Y, Celnikier DH. Placenta accreta is associated with IVF pregnancies: a retrospective chart review. BJOG. 2011;118(9):1084–9.
181. Yaron Y, Ochshorn Y, Amit A, Kogosowski A, Yovel I, Lessing JB. Oocyte donation in Israel: a study of 1001 initiated treatment cycles. Hum Reprod. 1998;13(7):1819–24.
182. Healy D. Damaged babies from assisted reproductive technologies: focus on the BESST (birth emphasizing a successful singleton at term) outcome. Fertil Steril. 2004;81:512–3.
183. Milki AA, Jun SH. Ectopic pregnancy rates with day 3 versus day 5 embryo transfer: a retrospective analysis. BMC Pregnancy Childbirth. 2003;3(1):7.
184. Voullaire L, Collins V, Callaghan T, McBain J, Williamson R, Wilton L. High incidence of complex chromosome abnormality in cleavage embryos from patients with repeated implantation failure. Fertil Steril. 2007;87(5):1053–8.
185. Jun SH, Milki AA. Assisted hatching is associated with a higher ectopic pregnancy rate. Fertil Steril. 2004;81(6):1701–3.
186. Yovich JL, Turner SR, Murphy AJ. Embryo transfer technique as a cause of ectopic pregnancies in in vitro fertilization. Fertil Steril. 1985;44(3):318–21.
187. Nazari A, Askari HA, Check JH, O'Shaughnessy A. Embryo transfer technique as a cause of ectopic pregnancy in in vitro fertilization. Fertil Steril. 1993;60(5):919–21.
188. Pyrgiotis E, Sultan KM, Neal GS, Liu HC, Grifo JA, Rosenwaks Z. Ectopic pregnancies after in vitro fertilization and embryo transfer. J Assist Reprod Genet. 1994;11(2):79–84.
189. Clayton HB, Schieve LA, Peterson HB, Jamieson DJ, Reynolds MA, Wright VC. Ectopic pregnancy risk with assisted reproductive technology procedures. Obstet Gynecol. 2006;107(3):595–604.
190. Strandell A, Thorburn J, Hamberger L. Risk factors for ectopic pregnancy in assisted reproduction. Fertil Steril. 1999;71(2):282–6.
191. Ng EH, Yeung WS, Ho PC. The presence of hydrosalpinx may not adversely affect the implantation and pregnancy rates in in vitro fertilization treatment. J Assist Reprod Genet. 1997;14(9):508–12.

192. Rosman ER, Keegan DA, Krey L, Liu M, Licciardi F, Grifo JA. Ectopic pregnancy rates after in vitro fertilization: a look at the donor egg population. Fertil Steril. 2009;92(5):1791–3.
193. Sauer MV, Kavic SM. Oocyte and embryo donation 2006: reviewing two decades of innovation and controversy. Reprod Biomed Online. 2006;12(2): 153–62.
194. Gibbons WE, Cedars M, Ness RB. Toward understanding obstetrical outcome in advanced assisted reproduction: varying sperm, oocyte, and uterine source and diagnosis. Fertil Steril. 2011;95(5): 1645–9 e1.
195. van der Hoorn ML, Scherjon SA, Claas FH. Egg donation pregnancy as an immunological model for solid organ transplantation. Transplant Immunol. 2011;25(2–3):89–95.
196. Yaron Y, Johnson KD, Bryant-Greenwood PK, Kramer RL, Johnson MP, Evans MI. Selective termination and elective reduction in twin pregnancies: 10 years experience at a single centre. Hum Reprod. 1998;13(9756315):2301–4.
197. Sauer MV, Paulson RJ, Lobo RA. Oocyte donation to women of advanced reproductive age: pregnancy results and obstetrical outcomes in patients 45 years and older. Hum Reprod. 1996;11(8981151):2540–3.
198. Unkila-Kallio L, Leminen A, Tiitinen A, Ylikorkala O. Nationwide data on falling incidence of ovarian granulosa cell tumours concomitant with increasing use of ovulation inducers. Hum Reprod. 1998; 13(10):2828–30.
199. Zalel Y, Shulman A, Lidor A, Achiron R, Mashiach S, Gamzu R. The local progestational effect of the levonorgestrel-releasing intrauterine system: a sonographic and Doppler flow study. Hum Reprod. 2002;17(11):2878–80.
200. Fragouli E, Escalona A, Gutierrez-Mateo C, Tormasi S, Alfarawati S, Sepulveda S, et al. Comparative genomic hybridization of oocytes and first polar bodies from young donors. Reprod Biomed Online. 2009;19(2):228–37.
201. Treff NR, Levy B, Su J, Northrop LE, Tao X, Scott Jr RT. SNP microarray-based 24 chromosome aneuploidy screening is significantly more consistent than FISH. Mol Hum Reprod. 2010;16(8):583–9.
202. Davies MJ, Moore VM, Willson KJ, Van Essen P, Priest K, Scott H, et al. Reproductive technologies and the risk of birth defects. N Engl J Med. 2012;366(19):1803–13.
203. Gobert B, Barbarino-Monnier P, Guillet-May F, Bene MC, Faure GC. Anti-ovary antibodies after attempts at human in vitro fertilization induced by follicular puncture rather than hormonal stimulation. J Reprod Fertil. 1992;96(1):213–8.
204. Brinton LA, Scoccia B, Moghissi KS, Westhoff CL, Althuis MD, Mabie JE, et al. Breast cancer risk associated with ovulation-stimulating drugs. Hum Reprod. 2004;19(9):2005–13.
205. Lerner-Geva L, Keinan-Boker L, Blumstein T, Boyko V, Olmar L, Mashiach S, et al. Infertility, ovulation induction treatments and the incidence of breast cancer–a historical prospective cohort of Israeli women. Breast Cancer Res Treat. 2006; 100(2):201–12.
206. Potashnik G, Lerner-Geva L, Genkin L, Chetrit A, Lunenfeld E, Porath A. Fertility drugs and the risk of breast and ovarian cancers: results of a long-term follow-up study. Fertil Steril. 1999;71(5):853–9.
207. Orgeas CC, Sanner K, Hall P, Conner P, Holte J, Nilsson SJ, et al. Breast cancer incidence after hormonal infertility treatment in Sweden: a cohort study. Am J Obstet Gynecol. 2009;200(1):72 e1–7.
208. Burkman RT, Tang MT, Malone KE, Marchbanks PA, McDonald JA, Folger SG, et al. Infertility drugs and the risk of breast cancer: findings from the National Institute of Child Health and Human Development Women's Contraceptive and Reproductive Experiences Study. Fertil Steril. 2003; 79(4):844–51.
209. Zreik TG, Mazloom A, Chen Y, Vannucci M, Pinnix CC, Fulton S, et al. Fertility drugs and the risk of breast cancer: a meta-analysis and review. Breast Cancer Res Treat. 2010;124(1):13–26.
210. Venn A, Healy D, McLachlan R. Cancer risks associated with the diagnosis of infertility. Best Pract Res Clin Obstet Gynaecol. 2003;17(2):343–67.
211. Kashyap S, Moher D, Fung MF, Rosenwaks Z. Assisted reproductive technology and the incidence of ovarian cancer: a meta-analysis. Obstet Gynecol. 2004;103(4):785–94.
212. Modan B, Ron E, Lerner-Geva L, Blumstein T, Menczer J, Rabinovici J, et al. Cancer incidence in a cohort of infertile women. Am J Epidemiol. 1998;147(11):1038–42.
213. Althuis MD, Moghissi KS, Westhoff CL, Scoccia B, Lamb EJ, Lubin JH, et al. Uterine cancer after use of clomiphene citrate to induce ovulation. Am J Epidemiol. 2005;161(7):607–15.
214. Ron E, Lunenfeld B, Menczer J, Blumstein T, Katz L, Oelsner G, et al. Cancer incidence in a cohort of infertile women. Am J Epidemiol. 1987;125(5): 780–90.
215. Ameratunga D, Weston G, Osianlis T, Catt J, Vollenhoven B. In vitro fertilisation (IVF) with donor eggs in post-menopausal women: are there differences in pregnancy outcomes in women with premature ovarian failure (POF) compared with women with physiological age-related menopause? J Assist Reprod Genet. 2009;26(9–10):511–4.
216. Budak E, Garrido N, Soares SR, Melo MA, Meseguer M, Pellicer A, et al. Improvements achieved in an oocyte donation program over a 10-year period: sequential increase in implantation and pregnancy rates and decrease in high-order multiple pregnancies. Fertil Steril. 2007;88(2):342–9.
217. Mirkin S, Gimeno TG, Bovea C, Stadtmauer L, Gibbons WE, Oehninger S. Factors associated with an optimal pregnancy outcome in an oocyte donation program. J Assist Reprod Genet. 2003;20(10): 400–8.

Oocyte Donation: Legal Aspects

2

Margaret E. Swain

Introduction

IVF with donor eggs has become an increasingly important option for fertility patients in the USA. Approximately 93 % of US clinics offering IVF also offer egg donation, and, across all age groups, nearly 10,000 donor-conceived fresh-embryo transfers were reported for 2010 [1]. Egg donors, under current constructs, may be anonymous to their recipients, share some degree of identification, or may be fully identified donors, either known to the recipients through family or friendship or chosen from among recruited donor candidates who permit their identities to be shared with the recipients of their eggs. A fertility treatment plan that includes a donor (or a surrogate) may be referred to as "collaborative" or "third-party" reproduction.

History

The first report of a live birth from "egg donation" was in February 1984 and actually involved transfer of an embryo conceived by the donor woman after insemination with the sperm of the intended father. On the fifth day following the insemination, Dr. John Buster, at the University of California at Los Angeles School of Medicine, removed the embryo from the donor woman's uterus by lavage and placed the embryo into the uterus of the intended mother [2]. Shortly thereafter, a group from Monash University (Australia) reported a live birth from a single, donated, unfertilized ova procured through an IVF procedure [3].

The earliest egg donor arrangements in the USA evolved in the days before cryopreservation techniques were refined and widely accepted in the ART community. A patient, undergoing IVF for her own reproductive purposes, would sometimes produce an unusually large number of eggs, which, if they were all to be inseminated, would create the expectation of more embryos than would be transferred in a single treatment cycle. The patient might have been approached by her physicians and asked if she would donate the supranumerary eggs to another cycling patient whose response to stimulation was poor. These earliest arrangements were almost always anonymous, there was rarely psychological counseling involved, payment was not generally part of the plan, and no particular, established protocols were in place [personal observation of the author, at the time a registered nurse working in a hospital-based fertility practice, circa 1984–1986]. This source of donated eggs was relatively short-lived, since, with improved methods of cryopreservation, fertility patients increasingly requested fertilization of all of their usable eggs and then froze those resultant embryos not transferred fresh.

M.E. Swain, R.N., J.D. (✉)
The Law Office of Margaret E. Swain, Towson, MD 21204, USA
e-mail: swainlegal@gmail.com

J.M. Goldfarb (ed.), *Third-Party Reproduction: A Comprehensive Guide*,
DOI 10.1007/978-1-4614-7169-1_2,

Without an identified and accessible supply of donor eggs, absent a friend or relative willing to donate, the opportunity to benefit from this type of ART was extremely limited. Then, sometime in the late 1980s, fertility centers began recruiting donors from the community at large, rather than from among their population of fertility patients. At this time, the donation was contemplated as simply that, with reimbursement only for actual expenses and recipient payment for the medical procedures. However, donor participation was sparse, and beginning around 1990, a few fertility centers began advertising for paid donor candidates, offering compensation for time, inconvenience, and other intangibles. Typically, the payments were approximately $2,000–$2,500 for a completed cycle. In 1991, one of the first commercial egg donor recruiting/matching groups was started in California [4].

Since the 1990s, with the notable exception of egg freezing, the basic science involved in egg donation has not dramatically changed, although treatment protocols continue to be refined and improved. The complex practical and legal aspects of egg donation have shifted dramatically, though, as the need for donors continues to grow.

The Legal Landscape

An egg donor is a woman who contributes her genetic material, usually for reproductive purposes, to another. A donor does not intend to be a parent of any resultant child and waives any rights she may have to the eggs upon the donation. The term "donor" is a very specific legal term: a woman who provides eggs for her own reproductive purposes and who intends to parent the resultant child should never be referred to as a donor.

Examining the commonalities of sperm and egg donation helps identify the rationale of the shared legal and policy development in gamete donation. Sperm donation, with its decades of utilization as a solution for male infertility, informed the early development of approaches to egg donation. For instance, the concept of anonymity in egg donation follows the usual paradigm in sperm donation. Sperm donation paved the way for, perhaps, easier acceptance of the concept of genetic material from a third party in the conception of a child for a genetically unrelated intended parent. Whether or not the use of donor gametes should be disclosed to a donor-conceived child, how that is best done, when the topic should be approached, and other disclosure issues are pertinent (and controversial) whether the donation is of egg or sperm. Additionally, since a majority of the states have codified various aspects of sperm donation (including parental rights for the intended father, donor rights and procedural requirements, among other things), a model for asserting equal rights protection for women receiving donated eggs has been established. While these state laws can be used as models for egg donation laws, it is important to note that the state laws regarding donor sperm are varied. Some of these laws only offer protection if the intended father is married to the mother; some, but not all, specifically terminate the rights of the donor; a number of them require professional medical participation or supervision; and several require consent of the intended father to the procedure, while others allow for implied consent.

While the framework of sperm donation has been helpful in the development and analysis of egg donation issues, there are obvious and significant differences between the two. The time commitment required and the complexity of medical participation for an egg donor have no parallel in sperm donation. While unlikely, if the donor develops a medical complication, it can represent a serious risk to the egg donor, a scenario that is not applicable to the sperm donor. The cost of an egg donor cycle, which can easily exceed $20,000 (when using a recruited, compensated donor), further distinguishes the egg donation process from that of donor sperm. Further, payments to the egg donor far exceed those paid to the sperm donor, raising questions of coercion and commodification. Accordingly, in response to the special concerns raised by egg donation, professionals in this area have developed medical and psychological screening guidelines for all participants, considered and formally commented on myriad ethical issues,

and suggested legal protections for participants and medical providers [5, 6].

Currently, fewer than 15 of the states in the USA have laws addressing egg donation.[1] In jurisdictions without statutory or precedential case law that establishes parental rights, there is no absolute assurance that the intended mother would be considered a legal parent. Fortunately, in the vast majority of cases, there is not litigation generated by controversy among the parties in these arrangements. (Worth noting is that while the paucity of case law reflects a general contentment with the practice of donation, its absence does not allow for reliable prediction of the outcome of any disputes.) Arguably, the reason that so few donor arrangements give rise to dispute and litigation is the application of carefully drawn safeguards, now practiced with regularity. These include recommendations for psychological evaluations and careful and thorough informed consent discussions. Another factor that serves not only the intended parents and the donor but also the clinician is a legal consultation for both donors and intended parents, with independent representation for the parties. This process allows a frank discussion of the legal risks and an explanation of rights and responsibilities by an expert who acts as an advocate for his or her client. The additional step of drafting and negotiating a direct agreement between the parties assures that they have reviewed the salient legal points; that a blueprint, agreed upon by all parties, outlines everyone's understanding of intent, contractual duties, and problem solving; and that this negotiated instrument memorializes that meeting of the minds.

While recommendations, current law, guidelines, and process may address some of the potentially troublesome aspects of egg donation, other issues may not be encompassed by existing protections. For example, in states where there is no law, the process for determination of the parental status of the intended mother and whether that determination will withstand a challenge are questions that continue to be debated. A medical provider's professional liability when facing, for example, an accusation of misuse of donor eggs or improper informed consent is also a topic that remains largely unsettled and is only resolved on a fact-specific, state-by-state basis.

[1] At the time of this writing, states that have statutes are CO LA, ND, OK, OR, TX, UT, VA, WA, WY, CA, NY, and FL.

Survey of Case Law

Parentage law varies widely from state to state, but most states' laws provide that the parental status of a natural mother can be established by some proof that she is the woman who has given birth to the child. However, not every state has a statute that defines the term "mother," although all codify a definition of "father." Exceptions to this understanding of the legal meaning of "mother" are particularly strained by gestational surrogacy arrangements and will be discussed further in the chapter on surrogacy. At a minimum, though, because of the various ART methods, there can now be up to five definitions of "mother": a woman who has both the genetic and gestating connection to the child, a woman declared by legal process to be the mother (as in adoption), a woman with a genetic but not gestating connection to the child, a woman who has given birth to the child, or a woman who has the intention, usually contractual, to be the mother, although this final definition is not always dispositive. (For instance, in a situation where an intended mother has contracted with a traditional surrogate [i.e., the woman giving birth is also the genetic mother], without the rare statue or case law that permits otherwise, the intended mother cannot be a legal parent without an adoption.)

Disagreements between donors and recipients that lead to a lawsuit about the maternity of a donor-conceived child are rare. Furthermore, in situations where donor-conceived babies are gestated by the (married) intended mother, the overwhelming trend is to recognize the gestating woman as the legal parent of the child. Notwithstanding, one of the first disputes involving egg donation addressed this very issue. In *McDonald v. McDonald* [7], a divorcing husband asserted that, since he was the only available genetic parent of the children born to him and his soon-to-be ex-wife through egg donation, he possessed a superior right to custody. The court,

having noted that the parents had entered into a written egg donation agreement that documented their intentions to both be parents, went on to declare that the father had no superior claim to the twin girls. In 1997 and, more recently, in a 2008 Tennessee case, the courts reached the same conclusion under similar circumstances [8].

More problematic is the scenario of the lesbian couple using ART to build their family, when one of the partners provides the eggs and the other gestates. A California case exemplifies challenges faced by fertility centers working with these patients. In *K.M v. E.G.* [9], the clinic provided the partner from whom the eggs were obtained with a consent form that labeled her a "donor," which she dutifully signed. There was no written parentage agreement between the two women, and the genetic mother did not subsequently adopt the twins who were born from the arrangement. Later, when the partners separated, they became ensnarled in a custody dispute, with the gestating mother claiming that her former partner was simply a donor and that there was no intent for her to parent. Initially, the trial court ruled that a woman who gave her oocytes to her lesbian partner, who, with donated sperm, conceived and gave birth to a child, was not a parent. The court reviewed the preconception intentions of the parties, as reflected in the standard "oocyte-donor" consent forms used by the medical facility, and noted that no further action was taken by the plaintiff to establish her maternity. The lower level appeals court also found in favor of the birthing mother. The ruling was overturned at the California Supreme Court level, and the court remarked that "…when partners in a lesbian relationship decide to produce children (by one partner providing her ova for IVF, with resultant embryos implanted into the other partner), both the woman who provides her ova and her partner who bears the children are the children's parents" [9]. The court also recognized that the two women intended to raise any resultant child together.

In a convoluted case involving an intended father who was also the genetic father and was unmarried, his unmarried partner and intended mother, a married gestational carrier and her husband, and an egg donor, an Ohio appeals court ruled that an oocyte donor had parental rights to triplets born to the carrier. The carrier had refused to release the triplets to their genetic father, and the donor asserted her claim of parental rights upon the request of the father [10]. This ruling challenged a prior Pennsylvania court's decision that the gestational carrier of the boys was entitled to primary custody. Eventually, applying a test established by the *Belsito v Clark* case (parental rights established by genetic link, but since donor had waived her rights, the only parent is the father), custody of the triplets was awarded to the father [11].

Other areas where problems occur in the context of egg donation are donor screening and mix-ups of gametes/embryos created with donor gametes. Screening of egg donors for communicable diseases and heritable disorders requires careful interviewing of the donor, review of her medical records, follow-up of test results, and reporting to the patient as well as to the anticipated recipients of her eggs. Adherence to the ASRM guidelines is also a critical component of the testing regimen [6]. In a 2003 case, an egg donor tested positive as a carrier of the cystic fibrosis gene mutation, but the test result was not reported to the recipients, who proceeded with the egg donation process and went on to give birth to a child with the disease. The medical practice did not test the intended father for carrier status. While the court disallowed the child's claim for wrongful life, it permitted the parents to proceed with their malpractice case against the medical practice [12].

Cases involving mix-ups of donor eggs appear to be uncommon, but can be particularly complex. For instance, a married couple, Denise and Robert, underwent IVF with an egg donor and sperm of intended father, while Susan, a single woman in the same practice, arranged to receive a donated embryo. Some of the embryos were inadvertently switched, and Susan received one of the embryos created with the husband's sperm and the donor's egg. The parties learned this from the clinic 10 months after a child was born to both Susan and to the wife, Denise. Denise and Robert filed a parentage action. The court determined that Robert had standing, that he was not a

"donor," and after ordering a paternity test, declared him the father. However, since Denise had no genetic or gestational connection to the child, the court dismissed her from the case, noting that her situation was distinguishable from cases where an intended mother contracts with an egg donor and a gestational surrogate. The gestating mother retained custody of the child and was declared to be the mother [13]. Although not involving donor egg, in a similar, widely publicized occurrence, two married couples underwent IVF at the same fertility center, but only one of them, Carolyn Savage, became pregnant. Four days later, the couples learned that Carolyn had received the embryo of the other couple, Shannon and Paul Morell. Carolyn decided to carry the child and, upon delivery, to place the baby with the genetic parents. The parties resolved the parentage issue among themselves, but not without tremendous strain on both couples. At least one of the couples negotiated a settlement with the fertility center [14]. In an interesting twist, in August 2011, the Savages went on to have twins via a gestational carrier [15].

In egg donor/recipient agreements, the usual understanding is that the donor's eggs are to be used by one particular recipient. If the arrangement is to vary from this basic understanding, then it must be clear that the donor had been informed, and did not object to, this variance. Proceeding with egg sharing or subsequent donation to another recipient, without the donor's prior notification and authorization, resulted in the downfall of at least one egg-matching organization and a messy lawsuit for the physicians involved. Several years ago, a donor believed that she had donated her eggs to particular recipients at a Texas fertility center but later learned that the eggs were being shared with another couple without her authorization. Ultimately, the fertility program and its physician were found liable for, among other things, failing to comply with their agreement with the egg donor agency. Amid allegations of other misdeeds, the agency folded shortly thereafter [16].

Egg donor arrangements involving gestational carriers further complicate the determination of which woman is the mother and, in some situations, determination of who is the father. In the early 1990s, a California couple received an embryo created with donor gametes and contracted with a gestational carrier to carry the pregnancy. During the pregnancy, the intended parents separated. During subsequent divorce proceedings, the husband contested any claim that the child was a child of the marriage, a determination that would implicate him in child support. The trial court agreed with him, but on appeal, the court ruled that the husband signing the surrogacy agreement was enough to determine the husband to be Jaycee's father, as he had been married to Jaycee's legal mother at the relevant time, and that he would be liable for child support [17].

Always a controversial area, egg donation has been the subject of much scrutiny and negative publicity regarding excessive payments to egg donors, reputed to be, in some cases, up to $50,000. While actual instances of such inflated compensation were exceedingly unusual, ASRM and SART, along with respected professionals in the related fields of fertility counseling, ethics, and law, recognized the importance of a careful analysis of donor recruitment practices and examination of the rationale and justification for donor payment. While recognizing that payment should fairly reimburse the donor for her time, risk, and inconvenience, the reviewers also expressed concern that payment should be limited, so that it does not represent undue inducement to participate in an activity that holds risk, both physical and emotional, for the participant [5]. Accordingly, ASRM suggested a cap on payments to egg donors, and SART instituted a policy that any recruitment organizations that wished to be listed on its website must agree to comply with the compensation suggestions [18]. In 2011, ASRM, SART, and the Pacific Fertility Center were all named defendants in an antitrust lawsuit filed in California by an egg donor. The donor, Lindsay Kamakahi, who also asks that she and other similarly situated donors be certified as a class, claims that the defendants engaged in impermissible price fixing by establishing and enforcing guidelines on payments that may be paid to donors by fertility centers. The case is still in preliminary stages [19].

Recent Developments in Egg Donation

Technological advances over the past several years have given rise to reliably consistent results in egg freezing, warming, and fertilizing, opening new doors for women who wish to preserve their own eggs for future use and for banking of donated eggs. In mid-September 2012, ASRM recommended removing the "experimental" modifier from the process, concluding that reliable research demonstrates that egg freezing, with subsequent thaw and fertilization, works just as well as fertilizing fresh eggs [20]. As with many innovations, egg freezing, particularly for donation, raises ethical and legal challenges for medical practices and banking organizations. Current practices of sperm banks and egg donation recruitment and matching services offer the rudiments of process and application for the practitioner, but differences among these options drive the need for development of specific policies and procedures.

An issue receiving renewed attention is that of donor-conceived children seeking out their genetic progenitors. Sperm banks now routinely ask their donors if they would consent to future contact by a child born from their donation, but this practice has not been so commonly practiced with egg donors. A direct contract between donor and recipient (which can be prepared while preserving immediate anonymity) may address this issue and provide a mechanism for such future contact. However, medical practices that do not refer these patients for legal consult and rely instead on their internal forms, usually an informed consent document, may not have the capacity or the framework to address these issues. Fertility practices are encouraged to develop written policies addressing these situations. Of course, future contact by a child assumes that the donor will then understand that a child has been born of her donation, information that is typically not shared with the donor. Newest research in this area, though, suggests that most donors would like this information and that some practices now, with permission by recipients, do share the outcome [21]. The degree of information provided (whether eggs fertilized, whether a pregnancy occurred, whether a child was born) varies. Hand in hand is the related topic of disclosure of his/her origins to the donor-conceived child. While the decision is left to the discretion of the parents, mental health professionals and other experts continue to recommend disclosure at an appropriate age, but research suggests that parents, even those who indicate that they intend to disclose, often do not [5, 21]. At least one state has recently adopted a law governing the release of donor-identifying information to children. While disclosure of identity is not mandatory, and the law provides that the donor may opt out of disclosure, it is silent as to what entity shall serve as the repository of donor information, how records are to be maintained, who will underwrite associated costs, and related issues [22].

Debate concerning the establishment of a national donor registry continues, and such discussion crystallizes the logistical issues that such an undertaking would face. Reasonable questions include the following: would registration be mandatory; would the registry provide full, identifying information; how would the information be protected; who would have access and how; would mandatory registration negatively impact the supply of donor eggs; where would such information be housed; who would administer the registry; what would be the cost; and how would it be funded? At present, privately created and managed registries such as the Donor Sibling Registry perform this function, charging a registration fee for recipients and donors, but participation in these arrangements is totally discretionary in most donor arrangements [23].

Implications for the Clinician

The overarching principle is that clinicians should review and follow professional guidelines in this area. Absent otherwise established standards of care, guidelines, although lacking real enforceability, are de facto standards of care against which practitioners will be judged. Even in light of the current threat imposed by the loom-

ing egg donor class action suit [19], this principle remains solid. Local laws and policies, as well as internal regulations, may allow for variances in the application of guidelines, but the importance of their use in day-to-day practice is well recognized.

Areas of general concern for the practitioner may include the following.

Informed Consent for Egg Donation Participants

During the last 25 years, as American bioethics and medical technology increasingly merged, but were often in discord, informed consent became a touchstone doctrine. The amount and complexity of information to be offered and discussed grew exponentially, and nowhere is this more apparent than in ART, most especially in collaborative reproduction, and particularly with respect to egg donation. The informed consent process primarily, although not exclusively, deals with risks to the patient. In egg donation, the risks pertain to the primary patient, to the potential offspring and to the donor patient, whose behavior is outside the control of the primary patient but for whom the primary patient is assuming some level of financial liability.

The exact requirements for the informed consent process itself and the depth and breadth of the information to be offered differ from state to state (and sometimes even among cases within a state). However, certain core elements are essential to any informed consent process, including for the egg donation patient:

1. The physician, not a physician-designee, conducts the informed consent discussion.
2. The patient consent is documented. Proving consent without written evidence of the patient's agreement is difficult, at best, so, generally, the patients should be asked to sign documentation of the discussion.
3. The consent should occur after a review of the essential elements, including:
   (a) Diagnosis, to the extent known.
   (b) Nature and purpose of the proposed treatment or procedure.
   (c) Benefits and risks and the likelihood of success.
   (d) Alternatives to the proposed treatment or procedure and their benefits and risks, including a discussion about the risks and benefits of doing nothing.
   (e) An assessment of that particular patient's ability to understand and documentation that he/she does evidence understanding of the topics discussed.

Additional areas of discussion for the intended parent participant include:

1. Financial obligations and specific costs—what the patient is expected to pay, what those charges are for, and when they are to be paid
2. Information regarding treatment options not available from the current provider
3. Disclosure of the federal reporting requirements and release of information about the patient to the report (nonidentifying)
4. Information about nonmedical options
5. Adoption and foster care as alternatives to family-building through fertility treatment
6. Living without children [24]

The medical aspects of each particular fertility treatment are complex and involve steps that are extraordinary in most realms of patient care. ASRM revised guidelines on gamete donation and its practice guideline on informed consent provide additional direction for the clinician [25].

Egg Freezing for Donation

It is reasonably anticipated that eggs banked for donation might not actually be provided to the eventual recipients/intended parents until, perhaps, years after the retrieval of those eggs. Under the current paradigm of egg donation, the donor usually relinquishes her rights to those eggs and any eventual embryos to a directed recipient. With egg banking, the relinquishment will likely be to the medical practice or other business entity, giving rise to a host of practical and liability concerns. For instance, does the practice have an obligation to provide updated medical information, which then would necessitate continuing contact with the donor? Should the practice entertain a

donor's "change of mind" as to unused, banked eggs? Another concern is structure of payments to the donor. As in traditional egg donation, any payment should be based on her time, inconvenience, and risk, and not in any way associated with the number or quality of eggs. In order to avoid running a foul of existing and possibly relevant organ donor laws, charges to the recipients of those eggs should not be based on number of eggs that they will receive. Rather, those fees should reflect clinic expenses, such as storage, laboratory fees, and the payment to the donor (apportioned among the various recipients according to a written policy), as well as the practice's customary charges for the medical services involved in the egg donation cycle. Also, different types of laws and standards apply to the sale of products as opposed to the provision of services, and these theories of liability can attach if practice materials suggest that the center is selling eggs [Remarks by N. Desai at the ABA Family Law Conference, Section on ART. FL, April 2012]. Quite clearly, suggested fee structure, marketing materials, and patient information should all be developed with, or at minimum, referred to, the practice's legal counsel before beginning any egg banking program.

Conclusion

ART with third-party collaboration forever changed the face of family formation. Egg donation, while still a comparatively new process, has undergone any number of procedural changes and medical protocol improvements since it was first introduced in the mid-1980s. The need for donors continues to grow, as does the technology: egg freezing is poised to break new barriers and allow for greater convenience, affordability, and choice for patients. However, developing treatments are burdened with the responsibility of extra diligence, measured application, and careful disclosures to patients about their risks and benefits. The law is slow to respond to rapid advances in medical technology, but practitioners may be guided by the lessons of the past in their visions for the future.

References

1. Center for Disease Control [Internet], cited October 27, 2012. http://www.cdc.gov/art/NationalSummaryReport.aspx.
2. Blakeslee S. Infertile woman has baby through embryo transfer. New York Times. February 4, 1984. http://nytimes.com/1984/02/04/us.
3. The New York State Task Force on Life and the Law Assisted reproductive technologies: analysis and recommendations for public policy. New York: 1998.
4. Spur D. The baby business: elite eggs, designer genes, and the thriving commerce of conception. Boston: Harvard Business School Press; 2006.
5. Ethics Committee of the American Society for Reproductive Medicine. Financial compensation of oocyte donors Fertil Steril [Internet]. 2007Aug [cited 2012 Sept 28]; 305:[about 4pp]. http://www.asrm.org;uploadedFiles/ASRM_Content/News_and_Publications/Ethics_Committee_Reports_and_Statements/financial_incentives/pdf; Informing offspring of their conception by gamete donation. Fertil Steril [Internet]. 2004 March [cited 2012 Sept 28]: 22:[about 5 pp]. http://www.asrm.org;uploadedFiles/ASRM_Content/News_and_Publications/Ethics_Committee_Reports_and_Statements/informaing_offspring_donation.pdf; Interests, obligations and rights of the donor in gamete donation. Fertil Steril [Internet]. 2009 January [cited 2012 Sept 28]: [about 4 pp]. http://www.asrm.org;uploadedFiles/ASRM_Content/News_and_Publications/Ethics_Committee_Reports_and_Statements/iinterests_obligations__rights_of_donors.pdf; Oocyte donation to post-menopausal women. Fertil Steril [Internet]. 2004 Sept [cited 2012 Sept 28]: S254:[about 2 pp]. http://www.asrm.org;uploadedFiles/ASRM_Content/News_and_Publications/Ethics_Committee_Reports_and_Statements/ipostmenon.pdf; Using family members as gamete donors and surrogates. Fertil Steril [Internet]. 2012 Oct [cited 2012 Sept 28]: 797:[about 6pp]. http://www.asrm.org;uploadedFiles/ASRM_Content/News_and_Publications/Ethics_Committee_Reports_and_Statements/ifamily_members.pdf
6. Practice Committee of the American Society for Reproductive Medicine. Repetitive oocyte donation, Fertil Steril [Internet]. 2008 Nov [cited 2012 Sept 27];S194:[about 2pp]. http://www.asrm.org;uploadedFiles/ASRM_Content/News_and_Publications/Practice_Committee_Opinions/Repetitive_oocyte(1)pdf, and Practice Committee of the American Society for Reproductive Medicine and the Practice Committee of the Society for Assisted Reproductive Technology. Recommendations for gamete and embryo donation, Fertil Steril [Internet]. 2012 Oct [cited 2012 Nov 1]; article in press FNS27810_proof. http://www.asrm.org;uploadedFiles/ASRM_Content/News_and_Publications/Practice_Guidelines/Guidelines_and_Minimum_Standards/2012_Guidelines_for_gamete(1).pdf.

7. *McDonald v. McDonald*, 608 N.Y.S.2d 477 (2d Dep't. 1994).
8. *Ezzone v. Ezzone*, Lake City Dom. Rels. Ct. (Ohio Oct. 24, 1997); *In re C.K.G.*, No. M2003–01320-COA-R3-JV (Tenn.App. 06/22/2004).
9. K.M. v. E.G., 117 P.3d 673 (Cal 2005); at 685.
10. Rice v. Flynn, 2005 WL 2140575 (Ohio App., 2005).
11. *Flynn v. Bim*ber, 70 Pa.D&C.4th 261 (2005); *Belsito v. Clark*, 67 Ohio Misc.2d 54, 644 N.E.2d 760 (1994).
12. *Paretta v. Med. Offices for Human Reproduction*, 760 N.Y.S.2d 639 (N.Y. Misc. 2003).
13. *Robert B. v. Susan B.* 109 CalApp.4th 1109, 135 Cal. Rptr.2d 785 (2003).
14. James S. ABC News [Internet]. NY: ABC News: Sept. 28, 2009 [cited 2012 Sept. 21]. www.abcnews.go.com/Health/MindMoodNew/unintended-surrogate-mom-wrong-embryo-faces-heartbrak-birth/story?id=8675885#.
15. Paxman L. Mail Online {Internet]. 2011 Nov. 17; cited 2012 Dec. 3]. www.dailymail.co.uk/health/article-2062679/Couple-miracle-twins-IVF-mix-forced-couples-bably.html.
16. *Options Nat. Fertility Registry v. Dr. Allon* (Jud. Dis. 190th, Harris Cty. TX,1/10/2005), referenced in Crockin SL, Jones HW. Legal conceptions: the evolving law and policy of assisted reproductive technologies. Baltimore: The Johns Hopkins University Press; 2010.
17. *Jaycee B. v. Superior Court of Orange County*, 49 Cal. Rptr. 2d 694 (Cal. Ct. App. 1996); *In re Marriage Buzzanca*, 72 Cal. Rptr. 2d. 280 (Cal. Ct. App. 1998), review denied, No. S069696, 1998 Cal. LEXIS 3830 (Cal 6/10/98).
18. Society for Assisted Reproductive Technology. [Internet] Birmingham, AL. 1996–2012 [cited 2012 Nov. 30]. http://www.sart.org.
19. *Kamakhi v. American Society for Reproductive Medicine et al.,* No. 11 CV 1781, complaint filed (N.D. Cal. Apr. 12, 2011).
20. Practice Committee of the American Society for Reproductive Medicine. Mature oocyte cryopreservation: a guideline. Fertil Steril [Internet]. 2012 Sept. 28 [cited 2012 Oct. 27];1:[about 7pp]; article in press. http://www.asrm.org;uploadedFiles/ASRM_Content/News_and_Publications/Practice_Committee_Opinions/ROvarian_tissue-and-oocyte(1)pdf
21. Kalfogulou AL, Geller G. A follow-up study with oocyte donors, exploring their experiences, knowledge, and attitudes about the use of their oocytes and the outcome of the donation. Fertil Steril 2004: 82:S304; Jensen C, Zweifel J, Davidson M, et al. Comparative assessment of pre and post-donation attitudes with respect to potential oocyte and embryo disposition among ovum donors in an egg program. Fertil Steril 2004; 82: S304.Golombok S, Readings J, Blake L, Casey P, Mellish, Larks A, Vasanti J. Children conceived by gamete donation: psychological adjustment and mother-child relationships at age 7. JFP. 2011 25.2: 230–239.
22. Washington State: RCW 26.26.750.
23. http:// www.donorsiblingregistry.com
24. Practice Committee of the American Society for Reproductive Medicine. Recommendations for gamete and embryo donation: a committee opinion, Fertil Steril [Internet]. Oct. 2012(article in press) [cited 2012 Dec. 3]; 1:[about 17 pp]. http://www.asrm.org;uploadedFiles/ASRM_Content/News_and_Publications/Practice_Guidelines/Guidelines_and_Minimum_Standards/2008_Guidelines_for_gamete(1).pdf, and Practice Committee of the American Society for Reproductive Medicine. Recommendations for informed consent: a committee opinion, Fertil Steril 2006 Nov; 86 Suppl.4.
25. Swain M. A brief history of informed consent: how evolving concepts play out in ART cases. Fam Adv. 2011;34(2):18–22.

Oocyte Donation: Psychological Aspects

3

Linda D. Applegarth

Introduction

In the past 30 years, advances in reproductive medicine have been multifold. In the mid-1980s, these advances subsequently led to the use of donated oocytes, enabling many infertile women and their partners, as well as single males and homosexual male couples, to become parents. In most cases, in vitro fertilization (IVF) using donor oocytes is a form of third-party reproduction in which a woman who is unable to become pregnant using her own eggs (recipient) utilizes the eggs of another woman (donor) in order to achieve pregnancy. In the case of single men, donated oocytes are inseminated with sperm from the single man, and in the case of homosexual male couples, with sperm from one of the male partners, with subsequent embryos transferred into the uterus of a gestational surrogate, which allows these men the opportunity to parent a genetically related child. Oocyte donation addresses a number of female medical conditions, including primary ovarian insufficiency (POI), genetic disorders, cancer treatment resulting in ovarian failure, prior surgical removal of ovaries, poor egg or embryo quality, recurrent miscarriage often stemming from chromosomal deficiencies, and advanced maternal age.

The focus of this chapter is to provide a review of historical and current literature pertaining to psychosocial aspects of oocyte donation and to describe the psychological and counseling issues that may arise for both oocyte donors and recipients. For clarification, the terms "known," "non-anonymous," and "anonymous" donors will be used in this chapter. A "known" oocyte donor is considered to be a woman who is known either by kinship or friendship to the recipients. A "non-anonymous" donor is a woman who is neither related to nor a friend of the recipients; however, she has provided identifying information about herself and is willing to have continued contact/relationship with the family, if requested. An "anonymous" donor is considered a woman with whom the recipient couple has no identifying information and with whom the family will have no contact before, during, or following the donation process.

Lastly, the mental health professional's role in working with this unique population will be addressed, particularly with respect to providing psychological education, consultation, and assessment protocols that are appropriate to these treatment groups. The importance of pretreatment psychological screening and counseling is underscored. In addition, the importance of collaboration with the medical treatment team, and

L.D. Applegarth, B.A, Ed.M., Ed.D. (✉)
Department of Obstetrics and Gynecology and Reproductive Medicine, Ronald O. Perelman-Claudia Cohen Center for Reproductive Medicine, The Weill-Greenberg Building, 1305 York Avenue, 6th Floor, New York, NY 10021, USA
e-mail: lia2004@med.cornell.edu

J.M. Goldfarb (ed.), *Third-Party Reproduction: A Comprehensive Guide*,
DOI 10.1007/978-1-4614-7169-1_3,

others, is stressed, with the goal of benefiting all parties involved in the donation process.

Review of Literature

Formal studies that address various psychological aspects of egg donation are plentiful. They address not only the psychosocial factors inherent in providing or receiving oocytes but also often consider levels of satisfaction experienced by both as a result of this family-building procedure.

Oocyte Donors

An early study [1] on the psychological status of oocyte donors ($N=26$) indicated that donor candidates were significantly more likely than controls to have experienced at least one reproductively related emotional trauma, or at least one significant family event such as death of a parent, parental divorce, chemical dependency or psychiatric disorder in a relative, or sexual abuse. On follow-up, however, 91 % of donors ($N=23$) were moderately to extremely satisfied with the donation experience [2]. The authors concluded that although psychological risk factors predicted potential donors' decisions to participate and their compliance, they were not predictive of donor satisfaction at follow-up. Over the past 20 years, however, it would be difficult to conclude that reproductive trauma or significant family events are predictive of the decision to become an oocyte donor. Differences in non-anonymous versus anonymous donors as well as issues regarding compensation versus non-compensation of donors may also be important factors not only in the psychological status of donors but also in the decision and motivation to move forward with donation. A recent Swedish study of the personality characteristics of non-anonymous oocyte donors found that the women accepted for inclusion in the donor program were all well adjusted and mature [3]. Klock and Covington [4] have stressed the importance of the thorough screening of potential donor candidates, both medically and psychologically. They reviewed 500 anonymous ovum donor profiles, considering standardized psychological test (MMPI-2) results and donation outcome. The authors found significant differences on test scores between donors who completed donation cycles and those who were excluded for psychological reasons. They stressed the importance of not only the use of psychological testing in donor candidate screening but also a careful review of the L (Lie) scale when considering donor selection. Again, in both studies noted above, donor screening was critical to inclusion in the various programs. A recent study by Williams et al. [5] also reported on the psychiatric status of a group of oocyte donor candidates. They again stressed the importance of careful psychological evaluation, given the tendency of potential donors to minimize psychiatric symptoms. Klock and colleagues [6] queried 115 donors who had completed at least one donation cycle at one of six IVF programs. They found that self-reported psychological symptoms and self-esteem were within the normal range, and 82 % of donors were moderately to very satisfied with the donation process. The researchers noted that donors who were willing to donate again were significantly less ambivalent about donation and expressed significantly greater satisfaction with the medical aspects of the donation [6]. Of note, Purewal and van den Akker [7] reviewed 64 studies regarding the psychosocial determinants of oocyte donation and extrapolate women's experiences of donation. They found distinct differences between known, compensated, volunteer, and potential donors on demographic characteristics, motives for donation, and issues relating to disclosure and attitudes towards the resultant offspring. The researchers also found that a significant proportion of oocyte donors and women from the general population were prepared to donate as identifiable oocyte donors. They also cited studies that examined the experiences of donors and report positive experiences. Importantly, the authors stressed that differences between donor groups highlight a need for specific types of psychosocial evaluation and counseling because it is not useful to generalize

across donor groups [7]. Jordan et al. [8] also found high levels of satisfaction on follow-up for a majority (79 %) of anonymous oocyte donors, as did Kalfoglou and Gittelsohn [9]. Kenny and McGowan [10] surveyed egg donors retrospectively following their first donation cycle. Their study examined the motivations, expectations, and experiences of 80 donors who donated between 1989 and 2002 at clinics in 20 states around the USA. The researchers noted that donors' motivations for donating their ova were "complex and intertwined" [10, p. 463], citing both altruistic and financial motivations for their donations, but altruism alone was not enough to attract most donors. Notably, however, the amount of financial compensation received by donors did not correlate with the importance that they attributed to the financial payment they would receive. Kenny and McGowan's study concluded that "the current systems for recruiting and educating donors are working well for most women but that there are arenas in which improvements can be made" [10, p. 465]. They stress that education and counseling of oocyte donor candidates can be improved so as to ensure that they better understand potential side effects of treatment as well as possible long-term consequences. The authors also suggest the need to develop procedures for tracking donors' physical and mental health for years after the donation was concluded [10].

Oocyte Recipients

In 2004, Hershberger [11] published an extensive, systematic review of published research in order to provide an overview of the psychosocial characteristics of donor oocyte-recipient women. The research was categorized into six focused areas: motivation; desired donor characteristics; the selection of a known versus anonymous donor; demographic, educational, and psychosocial profiles; disclosure to resulting child and others; and the relationship between the oocyte recipient and her resulting offspring. Despite this extensive information, the author concluded that there was still much to be learned about the psychosocial aspect of donor oocyte-recipient women, particularly since governmental policies and practices differ in many countries and subsequently impact recipients' attitudes and decisions about oocyte donation [11]. In some countries, such as the USA, donated oocytes can be either anonymous or non-anonymous. In other countries, anonymous donation is the tradition (France), while in others (e.g., United Kingdom, Sweden, Australia, Canada) donor identity information must be available to the offspring. The availability of appropriate donors, known or anonymous, is also a factor that influences recipients' motivations, feelings, and decisions about oocyte donation and donors. Baetens and colleagues [12] reported on 144 couples who were counseled by a psychologist regarding the kind of donation to be used. About 69 % of recipient couples preferred known donation. They report that this choice was primarily motivated by fears related to anonymity (i.e., unknown origin of genetic material) as well as the positive feelings they had about the known donor. Approximately one-third of recipient couples preferred an anonymous donor so as to create explicit boundaries around the families involved [12]. Similarly, Stuart-Smith et al. [13] considered oocyte donor recipients' reasons for choosing an anonymous donor and explored recipients' feelings and wishes regarding donor information. The study concluded that the choice of an anonymous donor was motivated by the wish on the part of the recipient woman to feel secure in the role of mother and to avoid possible intrusions into family relationships. The authors also found that curiosity about the donor grew stronger after the birth of the child, and the task of disclosing to the offspring was more "daunting when very little was known about the donor" (pp. 2067). Stuart-Smith and colleagues directly suggest that their findings have important implications for pretreatment counseling [13].

In any case, the decision for most infertile couples to undertake oocyte donation as a family-building alternative is often not an easy one. Decisions about type of donor utilized (known, non-anonymous, or anonymous) are also very complex and include a number of future implications that impact the family, the couple, the

offspring, and the donor. A number of studies therefore stress the importance of pretreatment counseling [11–14].

Psychosocial Consultation, Screening, and Evaluation in Oocyte Donation

The psychosocial constructs that underlie the evaluation process in egg donation differ for donors and recipients. In both cases, however, pretreatment psychoeducation should be a key component of the overall protocol. These meetings with the mental health professional are important for both oocyte donors and recipients so that each party is informed and prepared and has an opportunity to explore potential short- and long-term implications of the decision to provide or receive oocytes.

Psychological Screening, Evaluation, and Education of Oocyte Donors

Although oocyte donors are not "patients" in the conventional sense (i.e., in need of medical care), their "psychological well-being and medical needs must always be of critical importance to all caregivers" [15, p. 339]. Unfortunately, however, the greater focus of most fertility clinics that perform oocyte donation, in the USA and elsewhere, is more on the stringent medical screenings required than on the importance of psychological screening and evaluation of the donor. There are indications that this attitude is slowly changing, however, as seen in recent revisions to the "Recommendations for Gamete and Embryo Donation" published by the Practice Committees of the American Society for Reproductive Medicine (ASRM) and the Society for Assisted Reproductive Technology (SART) [16]. Importantly, these recommendations not only focus on more clearly stated criteria for psychological screening of *both* oocyte and sperm donors but also go beyond required medical screening as put forth by the US Federal Drug Administration (FDA).

Of interest, oocyte donors are more likely to undergo clinical psychiatric interviews and psychological testing than are their male counterparts. Almeling [17] has noted that from a sociologic standpoint, oocyte donors are more "valued" than sperm donors. She emphasizes that although eggs and sperm are similar types of cells, there appear to be different understandings of the practice of donation on the parts of sperm banks, donor egg agencies, clinics, and perhaps society in general. The author points out that depending on the sex of the donor, the donation is viewed as either an altruistic "gift" (provision of oocytes) or an easy "job" (provision of sperm), and this attitude subsequently affects the "women and men whose sex cells are being purchased" [17, p. 3].

In many oocyte donation programs, the value of psychological screening of oocyte donors has been acknowledged. However, there may be difficulty in specifically determining what the psychological assessment of oocyte donors should entail. Similarly, the use of standardized psychological testing varies among evaluating clinicians, including the screening tools themselves. Not all mental health professionals are qualified to administer or interpret standardized psychological tests; however, careful and thorough screening and evaluation can certainly be done without formal testing, or the test administration and interpretation can be outsourced to a qualified professional. Applegarth and Kingsberg [15] have presented a list of psychosocial criteria for the inclusion or exclusion of gamete donors (Table 3.1). These psychological screening criteria are not dissimilar to those recently put forth by the Practice Committees of ASRM and SART [16], and Schrover [18] has also developed comprehensive donor screening areas and issues that can be effectively assessed during the structured clinical interview.

The rationale for psychological screening and evaluation is multifold and includes, first and foremost, a thorough clinical interview of the potential oocyte donor by the mental health professional. Importantly, the interview helps rule out those women with significant psychopathology and allows for a discussion of the candidate's expectations and motivations for donating. In the

Table 3.1 Psychological indicators for acceptance or rejection of a gamete donor[a,b]

Positive indicators	Negative indicators
Absence of significant psychopathology	Significant DSM-IV axis I or II disorder, including standardized psychological testing score that is two standard deviation above mean
Absence of unusual life stressors	Significant current stress
Use of adaptive coping skills	Chaotic lifestyle, impulsiveness, poor coping skills and judgment
Ability to provide informed consent and understand medical protocols when necessary	Inability to provide informed consent and understand medical protocols when necessary
Supportive and stable interpersonal and/or marital relationships	Marital instability, lack of social support system
Economic stability	Significant economic instability or financial need
Standardized psychological testing within normal limits	Positive history or family history of heritable psychiatric disorders or substance abuse/dependence
Education/employment stability	Significant history of erratic educational background or employment
	Current use of psychotropic medications
	History of sexual or physical abuse with no professional treatment for donor
	History of legal difficulties/sociopathy

[a]Reprinted with permission from Applegarth LD, Kingsberg SA. The donor as patient: assessment and support. In: Covington SN, Burns LH, eds. Infertility counseling: a comprehensive handbook for clinicians. 2nd edn. Cambridge, UK, and New York: Cambridge University Press; 2006: 339–55

[b]Objection to gamete donation on the part of the donor's partner should be grounds for at least deferment, and probably cancellation, of the donation. The donation should never interfere with or create problems in the relationship between partners or significant relationships

USA, it would be both naive and probably erroneous to expect anonymous oocyte donor's motivations to be purely altruistic. However, the screening should certainly assess whether the donor candidate's motivations may be unhealthy or unrealistic. Other important aspects of the clinical interview are to assess the presence of coercion, financial or emotional, the ability to provide informed consent in relation to expectations about the medical procedures, the ability to cope with the demands and stresses of the medical protocol, and the ability to consider thoughtfully the potential emotional consequences of the donation, both short and long term [15].

As noted previously, standardized psychological testing is an effective means of screening potential oocyte donors in conjunction with the structured psychological interview. However, the use of well-validated, objective measures of psychopathology and psychological adjustment is most critical in this assessment process. This form of evaluation can help identify unseen psychopathology, validate the findings of the clinical interview, or provide areas for further discussions as part of the evaluation and assessment of the oocyte donor [15].

Ideally, the potential donor's partner (if there is one) should also be a part of the clinical interview(s). This allows the partner to be better informed about the medical procedures involved and to provide informed consent. The interview can ascertain the partner's thoughts and feelings about the donation and allows for a discussion of the potential impact of oocyte donation on the couple, including future offspring.

Lastly, the psychosocial screening and assessment of *known or non-anonymous* oocyte donors should include a thoughtful discussion and evaluation of the real and/or expected relationship that the donor has or will have with the recipients as well as the resulting offspring. Underlying this screening is the intent to protect all parties involved as completely as possible and to decrease the possibility of later regret or strained relationships. In the case of known donation, siblings or cousins (intrafamilial donation) are most often the donor candidates, and careful evaluation is critical. On occasion, the mental health professional will

have to assist the potential donor in concluding that the donation is not advisable as well as help to provide a rationale for ending the process. Some of the issues to be addressed and assessed during the pre-donation evaluation of known or non-anonymous should include [15]:

- Discussion of feelings and fantasies about the future offspring. (Whose child is this?) What will the relationship between donor and offspring be?
- Discussion of the relationship between donor and recipient(s)—now and in the future. How will the donation impact the relationship?
- Discussion of the plans regarding disclosure to offspring and others. Are all parties comfortable with disclosure or nondisclosure?
- Evaluation of coercion or pressure to donate because of the close relationship between donor and recipient(s).

Legal consultation is also often advised in the case of the use of a known or non-anonymous oocyte donor.

Psychosocial Screening, Consultation, and Education of Oocyte Donation Recipients

Infertile women and couples must often make an emotionally painful transition in their decision to use donated oocytes. Many have been through ongoing efforts, including years of medical treatment, to have a healthy child that is genetically related to both partners or to the woman who is choosing single parenthood. The transition can be difficult on many levels and can lead initially to a sense of shock or revulsion, along with anger, resentment, depression, fear, and loss. A significant period of time may be required to relinquish the hope of producing a genetic child, and the ability to accept oocyte donation as a family-building option may be nearly impossible. However, as frustration and despair builds over failed treatment cycles, along with heavy financial costs (and infertility *continues* to be the primary focus of one's life), oocyte donation may gradually be considered a viable option: it allows not only for improved chances of success but also for the experience of pregnancy and childbirth. It may also provide a genetic link to the male partner and provides control over prenatal care and custody. Yet, for many, despite an expanding comfort level with oocyte donation, fears and fantasies may also linger. Commonly, donor oocyte-recipient woman expresses fear that they will not "love" or feel attached to the child, and vice versa. Similarly, she may feel that her partner may not see her as the legitimate mother of the child or that the child may not be accepted as a legitimate member of the family (i.e., grandchild or niece/nephew and so forth). The loss of the genetic tie to the offspring is often profound and prolonged. Male partners may also resist moving to oocyte donation because the idea of not having a child that is related to his partner is deeply emotionally painful.

Because family building via oocyte donation can be an emotionally loaded decision for so many individuals and couples, the need for psychosocial consultation and education is critical and can be immensely helpful by providing emotional support and information. This notion has not only been strongly supported by ASRM's Mental Health Professional Group for many years but is also now recommended by the Practice Committees of American Society for Reproductive Medicine and the American Society for Reproductive Medicine in general [16]. Likewise, in 2002, the Psychological Special Interest Group of the European Society for Human Reproduction and Embryology (ESHRE) also published *Guidelines on Counselling in Infertility,* making specific recommendations on counseling issues in oocyte donation [19]. Others have also made similar recommendations [20].

In general, the psychosocial assessment interview with donor oocyte recipients also includes a psychoeducational component. Table 3.2 [21] presents a list of issues to be discussed and explored with recipient individuals and couples. The interview not only includes acquisition of information about infertility history, marital and relationship history, alcohol/drug use, past or present abuse/neglect, availability of social support systems, and thoughts

Table 3.2 Issues to include in a thorough structured clinical interview of oocyte donor (OD) recipients[a]

• Couple's infertility history: assessment of how they experienced it and how it was grieved
• How couple decided to do OD and how they feel at present
• History of marital relationship, legal difficulties, alcohol/drug use, abuse/neglect
• Past traumas and current stressors, coping skills, support network
• Assessment of woman's feeling/comfort level with biological inequality or attachment concerns
• Couple's thoughts and ideas re: openness versus privacy, known versus anonymous donor
• Thoughts/fears about donor motivation, information on donor assessment
• Cryopreservation/disposition of excess embryos, prenatal testing, multiples, selective reduction

[a]Reprinted with permission from Sachs PI, Burns LB. Recipient counseling for oocyte donation. In: Covington SN, Burns LH, eds. Infertility counseling: a comprehensive handbook for clinicians. 2nd edn. Cambridge, UK, and New York: Cambridge University Press; 2006: 319–38

and feelings about disclosure/openness versus nondisclosure/privacy but also addresses recipients' thoughts and feelings about donor selection. This includes information about feelings and decisions about known versus anonymous donors as well as preferences regarding donor characteristics. The goals of psychosocial assessment and psychoeducational counseling are not only to establish a positive, supportive relationship with the recipient but also to evaluate emotional readiness to move forward with the oocyte donation procedure, along with unresolved conflicts or psychological issues that could be a "significant impediment to positive outcome" [21, p. 333].

Although the purpose of the psychosocial assessment and psychoeducational meeting is seldom intended to withhold treatment from oocyte donor recipients, there may be indications that the couple or individual is not prepared to move forward with the donation procedure. From the outset, in any case, recipients must be informed that the psychosocial consultation also includes a screening component. Sachs and Hammer Burns [21] have delineated several issues that could lead to the decision by the medical treatment team to defer or postpone treatment. These include:

- Significant disagreement between partners about the decision to use donated oocytes
- Significant marital conflict that assumes that having a child will repair a marriage or allow one partner to exit the relationship
- Serious mental health problems that are unacknowledged and/or untreated that may impair the individual's ability to provide informed consent or comply with treatment
- Active substance abuse/addiction or partner abuse
- Denial and an unwillingness to learn about the unique aspects of parenting via oocyte donation and accept the differences, including an acknowledgment of the donor
- The pursuit of oocyte donation in an effort to have a child that meets only the parent's needs without regard to the child's needs
- Persistent rejection of donor candidates or the inability to select a donor not due to lack of oocyte donor availability

Lastly, it should be stressed that a key component of the psychosocial assessment and psychoeducational consultation is not only to assist individuals and couples in the effort to restore emotional well-being and self-esteem after protracted periods of infertility and failed treatments but also to address thoroughly the issue of disclosure of oocyte donation with the potential offspring, as well as family members or friends. Often, during the interview, recipient couples feel unprepared to make disclosure decisions. Unless they are fully committed to nondisclosure and secrecy, including having told no one about the oocyte donation, many couples are ambivalent and uncertain about this issue. Couples must be "encouraged to explore it (disclosure) and not avoid the issue, thus denying the reality of what they are doing and the future implications of their decision" [21, p. 334]. Disclosure decisions must be addressed, especially when there is intrafamilial donation. In this context, individual, marital, and family relationships will ultimately impact the disclosure decision and have important implications for the future child(ren) as well as the entire family.

The Role of the Mental Health Professional in Oocyte Donation

The mental health professional should be considered an important component of the infertility treatment team in third-party reproduction. The decision to provide or receive oocytes is psychosocially complex and multifaceted and must include the consideration of the individual's overall health, infertility and mental health histories, functional status, and emotional well-being. In this sense, the infertility counselor is often involved in collaborative relationships with donors, recipients, medical staff, other mental health professionals, and related organizations, such as consumer groups, donor oocyte agencies, and/or legal groups. As Covington [22] also notes, the role of the mental health professional in reproductive medicine "extends beyond advising and comforting: It requires specialized skill, knowledge, and training in the interrelation of the medical and psychological aspects of infertility…" [22, p. 493].

The mental health professional may or may not be physically housed within the fertility clinic or practice; however, his or her role remains that of providing consultation and evaluation services for prospective oocyte donors and recipients. In addition to these evaluation services are subsequent recommendations provided to the medical staff regarding the suitability and appropriateness of the candidate to move forward with the oocyte donation process. In this sense, the mental health professional is not solely a "gatekeeper," but rather an important resource for both patients and medical personnel with the notion of shared responsibility for inclusion or exclusion. Most importantly is the establishment of a positive and productive relationship with the oocyte donor or recipient, one that involves not only ongoing emotional support but also careful assessment and sensitive feedback to all parties. The mental health professional's ultimate goal is to optimize each patient's understanding, coping skills, emotional well-being, and mental health status. That result may, in fact, include the recommendation and decision not to move forward with the donation process. In both situations (inclusion or exclusion in oocyte donation), it is hoped and expected that the patient (donor candidate or recipient) benefits in the long term, as does the medical practice, and certainly the potential offspring.

Conclusion

Research on the psychological aspects of donating or receiving oocytes has become increasingly plentiful over recent years. For oocyte donors, the literature has focused not only on their psychological characteristics but also on their motivations, thoughts, and feelings about anonymity or non-anonymity and on their feelings and experiences post-donation. For donor oocyte recipients, many research articles consider recipients' decision-making, feelings about anonymous versus non-anonymous donation, disclosure or nondisclosure, donor selection criteria, and/or relationship between recipient and resulting offspring.

The psychosocial constructs that underlie the screening and evaluation process in egg donation differ for donor and recipients. However, in both cases, pretreatment counseling and psychoeducation should be a key component of the overall protocol. The goal is to ensure, as much as possible, that oocyte donors and recipients are informed, emotionally prepared, and have the opportunity to explore potential short- and long-term implications of their decisions. At the same time, the mental health professional must also perform a thorough clinical interview that, for potential oocyte donors, is intended to rule out significant psychopathology and assess motivations, along with the presence of financial or emotional coercion, the ability to cope and comply with the demands and stresses of the medical protocol, and the ability to provide informed consent in relations to expectations about the medical procedure. Standardized psychological testing is often a helpful and valued addition to the evaluation process when considering the psychological status and adjustment of the oocyte donor candidate.

For donor oocyte recipients, the decision to move forward with the donation can be painful and emotionally loaded. For many, the many

months and years of failed fertility treatment can result in anger and despair, and the time needed to relinquish the hope of producing a genetic child (and subsequently embrace the third-party option) can be protracted. As a result, the need for pretreatment psychosocial consultation and education is critical. A key component of the consultation is also to address thoroughly the issue of disclosure. This consultation has a clear assessment component as well, and oocyte donor recipients must be made aware of this. There may, in fact, be indications that the couple or individual is not prepared to move forward with the donation procedure. In those cases, the medical treatment team may make the decision to defer or postpone treatment.

Lastly, the mental health professional plays an important role in the oocyte donation process and should be considered an important member of the infertility treatment team. The infertility counselor is thus involved in *collaborative relationships* with oocyte donors, recipients, medical staff, other mental health professionals, and related organizations. The mental health professional's ultimate goal is to provide ongoing emotional support to all parties and to optimize each patient's understanding, coping skills, emotional well-being, and mental health status.

References

1. Schover LR, Reis J, Collins RL, Blankenstein J, Kanoti G, Quigley MM. The psychological evaluation of ovum donors. J Psychosom Obstet Gynaecol. 1990;11:299–309.
2. Schover LR, Collins RL, Quigley MM. Psychological follow-up of women evaluated as oocyte donors. Hum Reprod. 1991;6:1487–91.
3. Sydsjo G, Lampic C, Brandstrom S, Grandmundsson J, Karlstrom PO, Solensten NG, et al. Personality characteristics in a Swedish national sample of identifiable oocyte donors. BJOG. 2011;118(9):1067–72.
4. Klock SC, Covington SN. Minnesota Multiphasic Personality Inventory (MMPI-2) profiles in the assessment of ovum donors. Fertil Steril. 2010;94(5): 1684–8.
5. Williams KE, Stemmle PG, Westphal LM, Rasgon NL. Mood disorders in oocyte donor candidates: brief report and implications for future research. Hum Reprod. 2011;26(4):847–52.
6. Klock SC, Stout JE, Davidson M. Psychological characteristics and factors related to willingness to donate again among anonymous oocyte donors. Fertil Steril. 2003;79(6):1312–6.
7. Purewal S, van den Akker OB. Systematic review of oocyte donation: investigating attitudes, motivations and experiences. Hum Reprod Update. 2009;13(5): 499–515.
8. Jordan CB, Belar CD, Williams RS. Anonymous oocyte donation: a follow-up analysis of donors' experiences. J Psychosom Obstet Gynaecol. 2004; 22(7):2040–50.
9. Kalfoglou AL, Gittelsohn J. A qualitative follow-up study of women's experiences with oocyte donation. Hum Reprod. 2000;15:798–805.
10. Kenny NJ, McGowan ML. Looking back: egg donor's retrospective evaluations of their motivations, expectations, and experiences during their first donation cycle. Fertil Steril. 2010;93(2):455–66.
11. Hershberger P. Recipients of oocyte donation: an integrative review. JOGNN. 2004;33(5):610–21.
12. Baetens P, Devroey P, Camus M, Van Steirteghem AC, Ponjaert-Kristoffersen I. Counselling couples and donors for oocyte donation: the decision to use either known or anonymous oocytes. Hum Reprod. 2000;15(2):476–84.
13. Stuart-Smith SJ, Smith JA, Scott EJ. To know or not to know? Dilemmas for women receiving unknown oocyte donation. Hum Reprod. 2012;27(7): 2067–75.
14. Laruelle C, Place I, Demeestere I, Englert Y, Delbaere A. Anonymity and secrecy options of recipient couples and donors, and ethnic origin influence in three types of oocyte donation. Hum Reprod. 2011;26(2): 382–90.
15. Applegarth LD, Kingsberg SA. The donor as patient: assessment and support. In: Covington SN, Burns LH, editors. Infertility counseling: a comprehensive handbook for clinicians. 2nd ed. Cambridge, UK, New York: Cambridge University Press; 2006. p. 339–55.
16. Practice Committee of the American Society for Reproductive Medicine; Practice Committee of the Society for Assisted Reproductive Technology. Recommendations for gamete and embryo donation: a committee opinion. Fertil Steril. 2013;99:47–62.
17. Almeling R. Sex cells: the medical market for eggs and sperm. Berkeley and Los Angeles: University of California Press; 2011.
18. Schrover LR. Psychological aspects of oocyte donation. Infertil Reprod Med Clin North Am. 1993;4: 483–502.
19. Baetens P. Oocyte donation. In: Boivin J, Kentenich H, editors. ESHRE monographs: guidelines on infertility counselling. London: Oxford University Press; 2002. p. 33–4.
20. Tarlatzis BC, Pados G. Oocyte donation: clinical and practical aspects. Mod Cell Endocrinol. 2000;161: 99–102.

21. Sachs PI, Burns LB. Recipient counseling for oocyte donation. In: Covington SN, Burns LH, editors. Infertility counseling: a comprehensive handbook for clinicians. 2nd ed. Cambridge, UK, New York: Cambridge University Press; 2006. p. 319–38.

22. Covington SN. Infertility counseling in practice: a collaborative reproductive healthcare model. In: Covington SN, Burns LH, editors. Infertility counseling: a comprehensive handbook for clinicians. 2nd ed. Cambridge, UK, New York: Cambridge University Press; 2006. p. 493–507.

Oocyte Donation: Ethical Aspects

4

Michelle L. McGowan and Leah Wilson

Introduction

Assisted reproductive technology (ART) allows for a disaggregation of genetic, gestational, and social motherhood, so that different women may embody each of these roles [1]. One method, in vitro fertilization (IVF) with donor oocytes, was first successfully implemented in 1983 and today comprises upwards of 12 % of all IVF cycles in the USA. Indications for using donor oocytes include women with ovarian insufficiency or ovarian dysfunction, women with specific genetic risk factors, and same-sex couples seeking to have children [2, 3]. Oocyte donation has provoked and continues to incite ethical controversy today. While bioethical discourse has given considerable attention to the implications of oocyte donation for research purposes (see [4–7], for example), in keeping with the spirit of the edited volume, this chapter focuses on the ethical discourse on oocyte donation for third-party reproduction. Specifically, this chapter addresses the morality of oocyte donation for reproduction, the moral significance of conceptualizations of oocytes, and ethics in the context of oocyte donation pertaining to the key constituencies involved in the process, including oocyte donors, recipients, children conceived with donor oocytes, clinicians, and oocyte donor matching agencies.

M.L. McGowan, Ph.D. (✉)
• L. Wilson, M.A., B.S.N., R.N. (✉)
Department of Bioethics, Case Western Reserve University, 10900 Euclid Avenue, TA 200, Cleveland, OH 44106, USA
e-mail: michelle.mcgowan@case.edu; leah.wilson@case.edu

Morality of Oocyte Donation and Conceptualizations of Oocytes

Philosophers and theologians have long grappled with the morality of oocyte donation for reproductive purposes. At one end of the spectrum lie perspectives that oocyte donation can never be morally permissible. These include Catholic theological claims that the manipulation of gametes outside the human body with the intent to conceive violates the "fundamental good" of maintaining "the integrity of human sexuality, which demands that conception take place through sexual intercourse" [8]. Within this theological view, oocyte donation is also considered immoral because it demeans women, reducing them to their procreative potential and utilizing this potential to improper ends [3]. Some secular bioethicists have argued that individuals have a moral responsibility to rear one's own offspring; thus, relinquishing responsibility for one's prospective offspring through oocyte donation is morally problematic, as this responsibility is abandoned [9] or taken too lightly [10]. The morality of oocyte donation in Islam depends on the religious sect. Sunni teachings maintain that reproduction must occur within the context of heterosexual marriage, thereby making the use of third-party

J.M. Goldfarb (ed.), *Third-Party Reproduction: A Comprehensive Guide*,
DOI 10.1007/978-1-4614-7169-1_4,

gametes adulterous; however, some Shi'ite authorities argue that oocyte donation may be permissible if the donor and recipient mothers abide by religious doctrine for parenting and inheritance [11, 12]. Taking a more ambiguous position, in Jewish theology the morality of oocyte donation depends on whether one considers maternity to be conferred genetically, gestationally, or both [13]. At the more permissive end of the spectrum lie bioethicists' arguments that providing one's oocytes to another is morally permissible because it allows individuals and couples experiencing medical or social infertility the opportunity to exercise procreative liberty to build a family [3, 14]. Scholars who accept (either conditionally or unconditionally) that oocyte donation can be morally permissible assess the moral legitimacy of oocyte donation for specific populations, the moral limits of oocyte donation practices, and the corresponding consequences of the practice for donors, recipients, and children [15]. Given its predominance in the literature, the remainder of this chapter will address the ethical debates within the context of the practice of oocyte donation.

Bioethics and social science scholars characterize oocytes in numerous ways, each of which has implications for conceptualizations of the ethical limits of the practice of oocyte donation for third-party reproduction. For some, oocytes signify "an intimate connection to personhood," while others see oocytes as having a potential market value [16]. Almeling argues that economic and sociobiological interpretations of the value of gametes, whereby oocytes are more highly valued than sperm due to their scarcity and women are considered to be more nurturing than men, may also attribute differential investment in gametes to women and men, regardless of procreative intent [17]. Others frame the provision of oocytes from women to individuals and couples to procreate as a donation, but this rhetorical framing has been criticized for connoting altruistic intentions when, in many cases, a commercial transaction takes place [16]. Despite the controversy, this chapter will utilize the terminology of oocyte donation owing to its commonality in the literature.

Ethical Considerations in the Practice of Oocyte Donation

Issues Pertaining to Donors

Regardless of how oocytes are conceptualized, ethicists have argued that in a context in which two women might be considered the mother of a resulting child, there is a strong need to have a detailed informed consent process to establish oocyte donation arrangements, confidentiality, and custody [18]. Ethical guidelines stress the importance of ensuring that prospective oocyte donors are well informed about a range of medical, psychological, and legal risks associated with donation; the time commitment associated with donation; and approaches to managing adverse events before they consent to participate in oocyte donation [14, 19, 20]. Ensuring voluntary informed consent takes on special importance in the context of known and interfamilial oocyte donation, to assess whether prospective donors are experiencing undue pressure from friends or family to participate [21, 22].

The immediate risk factors associated with ovarian stimulation and oocyte donation have been well articulated: pain, cramping, hemorrhage, bloating, infection, reactions to fertility drugs and anesthesia, surgical complications, and ovarian hyperstimulation [21]. Psychological risks that oocyte donors may experience include "concern for and/or attachment to potential offspring, concern that the donor or resultant child might want a relationship with them in the future," and "stress resulting from the donation process as a whole" [23]. Black has also suggested that prospective donors should be adequately informed that they may face psychological risks associated with receiving results from the health and genetic tests utilized to screen prospective donors [21]. While some research indicates that oocyte donors generally feel adequately informed about the physical risks associated with donation [23], others suggest that clinics and oocyte donor matching agencies provide inadequate or incomplete information about risks associated with donation [24]. It has been suggested

that this could be alleviated through additional pre-donation education and counseling regarding the risks and long-term consequences of donation to diminish the possibility that women may be unduly influenced to donate their gametes [23, 24]. Researchers have also raised concerns that long-term tracking of donor health is inadequate and that longer term contact with donors would promote accurate assessment of the lifetime health risks of ovarian stimulation in healthy young women [23]. The long-term health effects of oocyte donation are largely speculative but may include increased risks to future fertility and cancer, which has provoked ethical questions about the extent to which prospective donors can be adequately prepared to assess the full range of possible risks to their own health and future fertility [16, 25]. The American Society for Reproductive Medicine (ASRM) states that there are no clearly documented long-term risks with repeated oocyte donation. However, because there is still a possibility that long-term risks may be indentified in the future, "it would seem prudent to consider limiting the number of stimulated cycles for a given donor to approximately six" [26].

Alongside the ethical management of medical and psychological risks associated with oocyte donation, one of the more hotly contested ethical issues in the context of oocyte donation has been the compensation of donors. At issue are (1) whether remuneration adequately protects donors' interests and (2) whether monetary remuneration inappropriately devalues or commodifies human life or treats women as a means to an end [27, 28]. The stance codified in many countries has been that oocyte donors should not be paid, so as not to exploit women or commodify human oocytes or resulting children [14]. This may reflect the moral belief that the market has no place in the domain of the family [29]. However, other healthcare systems have justified compensating donors by indicating that remuneration ensures an adequate pool of prospective donors, who without compensation would not otherwise consider donating, as they might incur costs for donating [30]. Some countries, like the UK, permit claims for costs associated with donation (e.g., travel, lost wages) and egg-sharing arrangements, whereby fertility patients can donate some of their oocytes to third parties for a reduced cost for their own IVF [30]. Conceptualizing compensation for oocyte donors in the USA as a fair practice emerged as an outgrowth of the tradition of compensating sperm donors for their time and efforts [31]. The ASRM's guidelines present the stance that remuneration up to $5,000 is a permissible level of compensation for the time, inconvenience, and effort associated with oocyte donation, but more than $10,000 would be inappropriate because prospective donors may be unduly induced by the sum and discount of the risks associated with donation [27].

The ASRM recommends that faithfully representing risks, burdens, and benefits associated with oocyte donation is an ethical imperative for clinicians and brokers recruiting prospective donors [27]. Yet, Levine's assessment of oocyte donor advertisements in the USA concludes that professional guidelines are not strictly followed and that compensation for donors with specific idealized traits is higher than recommended [32]. While this likely reflects that ASRM guidelines lack the enforcement of regulations, Levine calls into question the commitment of the fertility industry to protect the interests of donors in their recruitment efforts [32]. The willingness of some to increase compensation for donors with specific traits also stirs ethical concern that oocyte donation may generate a market for creating "designer babies" [32] and perpetuate positive eugenic values by "ascribing superior human traits to those who most closely match Western ideals of…femininity for the purpose of human reproduction" [33]. Yet, as Robertson has argued, society condones choosing one's mate on the basis of characteristics, so it may be unfounded to treat the genetic endowment of offspring with socially desirable oocyte donor characteristics any differently [14]. Thus, the question remains whether choosing donors with socially desirable traits runs the risk of objectifying future offspring by inadvertently assigning them an explicit intrinsic value [34].

Others have raised the concern that women may be unduly induced to donate their oocytes if "the lure of financial gain may lead them to discount the risks to themselves and to make

decisions they will later regret" [3]. This has been debated in both the context of paid donation and egg-sharing arrangements, with concerns pertaining to the potential exploitation and undue inducement of financially vulnerable potential donor pools, such as college students and fertility patients who would not otherwise be able to afford IVF treatment [15, 33, 35, 36]. Some research assessing donor motivations suggests that these concerns may be well placed [23], yet others have pointed out that there is no evidence that offering donors higher payments or compensation in kind necessarily leads to exploitation or undue inducement [14, 36]. Other ethicists have argued that if women are to be compensated for their time, effort, and the risks associated with oocyte donation, then it would be unjust to compensate them too little [3]. Some scholars have raised the additional concern that the growing global demand for donor oocytes raises the potential to exploit already impoverished women from lower income settings in countries such as Romania, Russia, Ukraine, and Latin America, which may exacerbate existing gendered, raced, and socioeconomic inequalities [37–39]. They argue that recruiting women from these settings for transnational oocyte donation may be ethically contradictory [40] because ART is differentially regulated globally; hence, medical and ethical standards of oocyte donation may vary across borders, and compensation for oocyte donors depends on the national setting and strength of the local currency [37–39].

Issues Pertaining to Recipients and Donor Offspring

The debate over adequate remuneration for oocyte donors also considers the impact of compensation schemes on recipients of donor oocytes. Clinicians in the USA have raised concerns that increasing compensation for donors will make the cost of treatment with donor oocytes more expensive for recipients [41]. While the costs of fertility treatments with donor oocytes depend heavily on the regulatory context, it is widely recognized that these treatments perpetuate medical inequity because access to services is (in many contexts) dependent on the ability of patients to pay for ART, owing to lack of health insurance coverage for oocyte donation [15, 33].

Some also raise concerns that allowing prospective parents to select donors based on a variety of traits runs the risk of commodification of resulting children or treating them as property and may be at odds with the expectation that recipients will love these much-desired children unconditionally [3]. Steinbock has raised the additional concern that recipients who invest a lot of money in an egg donor with desirable traits may be disappointed if a child does not live up to their expectations [3]. The Human Fertilisation and Embryology Authority in the UK has used this concern as a justification for banning payment for donors, but Steinbock argues that there is no plausible impact on resulting children regardless of whether the donor was compensated [3]. Unlike other constituencies involved in third-party reproduction, donor-conceived children never have a say in the ethicality of the conditions under which they were conceived; thus, it has been argued that parties involved in constructing oocyte donation carefully consider the interests of would-be children [22].

For instance, an ongoing debate in the context of oocyte donation pertains to determining the normative bounds of acceptable usage of donor oocytes. As was mentioned at the outset of this chapter, proponents of the moral permissibility of oocyte donation condone the practice on the grounds that it permits women experiencing ovarian failure and insufficiency, women of advanced maternal age, carriers of known heritable genetic mutations, and same-sex couples the opportunity to have a child that may be genetically related to a male partner (if there is one) [3, 14]. However, extending gestational and social parenthood to some of these populations has not been without controversy. Of note has been the contentiousness of extending oocyte donation to postmenopausal women. Arguments in favor of allowing postmenopausal women to utilize donor oocytes have defended gender equity in access to ART and procreative liberty for individuals, regardless of age, as long as the risks to woman's health, children,

and society are within reason. The decision to allow oocyte donation should be approached on a case-by-case basis [15, 42]. However, others discourage oocyte donation to postmenopausal women on the grounds of risks to the postmenopausal recipient's health, children's well-being in light of diminished parental life expectancy, and the social consequences of the technical disruption of "natural" reproductive life, all of which may outweigh the benefits [15, 42].

Balancing Interests of Donors, Recipients, and Offspring

A contemporary debate in the context of oocyte donation for third-party reproduction engages the question of donor anonymity. The rationalities underpinning anonymous and identifiable donation pertain to perceptions regarding the effects of the availability of information on the well-being of donors and donor offspring. The stigma associated with infertility is often given as the explanation for upholding secrecy about the genetic origins of donor offspring [28], and some argue that anonymity is required to protect the privacy and interests of oocyte donors and recipients [43, 44]. Others argue that there is insufficient evidence to support that either anonymity or secrecy is harmful [45]. Those supporting the shift towards disclosure of parentage argue that secrecy creates a negative power dynamic between parents and children [28] and that children should have a right to know their genetic origins and have access to identifying information about the donor once they reach the age of majority [46, 47]. Socio-legal and cultural shifts away from secrecy and towards more openness in gamete donation currently are underway in Western Europe, Australia, and New Zealand [28, 47]. Anonymous oocyte donation remains the norm in the USA, though the Ethics Committee of the ASRM recommends informing donor offspring of their genetic origins [48], and some gamete recipients and donor offspring have advocated for establishing donor databases (i.e., Donor Sibling Registry).

Another arena in which parties' interests must be weighed against one another is with regard to knowledge of donation outcomes and disposition of oocytes. While professional guidelines suggest that donors have a duty to share information about their health that may be relevant to donor offspring before and after donation (when appropriate), there is a lack of consensus regarding how much information programs should be obliged to disclose to donors about donation outcomes and disposition of surplus embryos [20]. Kalfoglou and Geller argue that donors may not be entirely comfortable with relinquishing the right to select recipients and determine how oocytes should be managed [49], which suggests that power dynamics in the current practice of developing oocyte donation contracts may disadvantage oocyte donors. To lessen the risk of adverse psychological impact of donating their oocytes, researchers have suggested that clinics and agencies consider the possibility of standardizing the delivery of non-identifiable information regarding outcomes of anonymous oocyte donation, particularly if a donation resulted in a pregnancy or live birth [23, 50].

Issues Pertaining to Clinicians and Agencies

In addition to clinicians' responsibilities to ensure adequate education and informed consent for oocyte donation, as has been detailed previously, ethical debate pertaining to the roles of clinicians (e.g., physicians, nurses, counselors, social workers) and oocyte donation matching agencies primarily focuses on conflicts of interest. Ethicists argue that the business models of donor agencies and IVF clinics promote optimization of donors' and oocyte sharers' utility (i.e., to obtain the maximal number of oocytes) with potential disregard for the donor's physical and emotional well-being, which they characterize as a conflict of interest between the donor or egg sharer and the agency or recipients [15, 51]. Within oocyte donation, conflicts of commitment may also arise when a physician or agency is serving two different parties whose interests may conflict [52], if, for instance, the clinic or clinicians are both utilizing the donor and providing fertility services for the recipient [22]. This is especially salient

because the recipient is the patient who bears the costs and provides income for the parties involved, while the donor is a provider of a service who is not acting within the context of a doctor–patient relationship [53]. While these conflicts may not pose as blatant a physical or emotional threat to donors as intentional overstimulation, power may operate more insidiously in conflicts of commitment pertaining to donors' dispositional authority and propriety to information. In such situations, Dickenson argues that donors may have insufficient power and control over the subsequent disposition of their oocytes or an alienation from their reproductive labor [5]. This has prompted the argument that respect for autonomy should include the donors' rights to determine the scope of use, storage, and disposal of their oocytes [33, 54]. However, given the lack of professional consensus regarding the disclosure policies of clinics and agencies [20], there is still considerable room for engagement of the ethical consequences of promoting donor autonomy in this regard.

Conclusion

Although third-party reproduction via oocyte donation has been available for nearly three decades, debates regarding the morality of the practice of oocyte donation continue to evolve. The morality of oocyte donation depends heavily on conceptualizations of human oocytes and the meaning of reproduction. Existing guidelines for ethical practice are shaped by the sociocultural and regulatory contexts in which donation takes place. However, regardless of the context, the interests of donors, recipients, offspring, and clinicians are entangled through the process of oocyte donation. The quality of informed consent and compensation for oocyte donors; recipient characteristics and rationales for seeking oocyte donation; impact of donor conception on donors, recipients, and offspring; and management of conflicts of interest are issues likely to continue to provoke debate about the consequences of oocyte donation in the years to come.

Acknowledgments The authors thank Valarie Blake and Julie Severson for their comments on an earlier version of this chapter. Research for this chapter was supported by the National Human Genome Research Institute (P50 HG003390). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Human Genome Research Institute or National Institutes of Health.

References

1. Stanworth M. The deconstruction of motherhood. In: Stanworth M, editor. Reproductive technologies: gender, motherhood and medicine. Cambridge, UK: Polity Press; 1987. p. 10–35.
2. Centers for Disease Control and Prevention. Assisted Reproductive Technology Report National Summary Report 2004–2010. 2012 [cited 2012 September 18]. http://apps.nccd.cdc.gov/art/Apps/NationalSummaryReport.aspx.
3. Steinbock B. Payment for egg donation and surrogacy. Mt Sinai J Med. 2004;71(4):255–65.
4. McGowan ML. Participation in investigational fertility preservation research: a feminist research ethics approach. In: Woodruff T, Zoloth L, Campo-Engelstein L, Rodriguez S, editors. Oncofertility: ethical, legal, social and medical perspectives. New York: Springer; 2010. p. 209–21.
5. Dickenson DL. Property and women's alienation from their own reproductive labour. Bioethics. 2001; 15(3):205–17.
6. Dickenson DL. The lady vanishes: what's missing from the stem cell debate. J Bioeth Inq. 2006;3:43–54.
7. Ballantyne A, de Lacey S. Wanted: egg donors for research: a research ethics approach to donor recruitment and compensation. Int J Feminist Approach Bioeth. 2008;1(2):145–64.
8. Lauritzen P, Vicini A. Oncofertility and the boundaries of moral reflection. Theol Stud. 2011;72(1):116–30.
9. Callahan D. Bioethics and fatherhood. Utah Law Rev. 1992;1992(3):735–46.
10. Benatar D. The unbearable lightness of bringing into being. J Appl Philos. 1999;16(2):173–80.
11. Zoloth L, Henning AA. Bioethics and oncofertility: arguments and insights from religious traditions. In: Woodruff TK, Zoloth L, Campo-Engelstein L, Rodriguez S, editors. Oncofertility: ethical, legal, social, and medical perspectives. New York: Springer; 2010. p. 261–78.
12. Inhorn MC. Making Muslim babies: IVF and gamete donation in Sunni versus Shi'a Islam. Cult Med Psychiatry. 2006;30(4):427–50.
13. Kahn SM. Rabbis and reproduction: the uses of new reproductive technologies among ultraorthadox Jews in Israel. In: Inhorn MC, van Balen F, editors. Infertility around the globe: new thinking on childlessness, gender, and reproductive technologies.

Berkeley, Los Angeles: University of California Press; 2002. p. 283–97.
14. Robertson JA. Is there an ethical problem here? Hastings Cent Rep. 2010;40(2):3.
15. Klein JU, Sauer MV. Ethics in egg donation: past, present, and future. Semin Reprod Med. 2010;28(4):322–8.
16. Holland S. Contested commodities at both ends of life: buying and selling gametes, embryos, and body tissues. Kennedy Inst Ethics J. 2001;11(3):263–84.
17. Almeling R. Selling genes, selling gender: egg agencies, sperm banks, and the medical market in genetic material. Am Sociol Rev. 2007;72:319–40.
18. Macklin R. Ethics, informed consent, and assisted reproduction. J Assist Reprod Genet. 1995;12(8):484–90.
19. New York State Task Force on Life and Law. Assisted reproductive technologies: analysis and recommendations for public policy. New York: New York State Task Force on Life and Law; 1998.
20. Ethics Committee of the American Society for Reproductive Medicine. Interests, obligations and rights of the donor in gamete donation. Fertil Steril. 2009;91:22–7.
21. Black JJ. Egg donation: issues and concerns. MCN Am J Matern Child Nurs. 2010;35(3):132–7.
22. The Ethics Committee of the American Society for Reproductive Medicine. Using family members as gamete donors or surrogates. Fertil Steril. 2012;98:797–803.
23. Kenney NJ, McGowan ML. Looking back: Egg donors' retrospective evaluations of their motivations, expectations and experiences during their first donation cycle. Fertil Steril. 2010;93(2):455–66.
24. Gurmankin AD. Risk information provided to prospective oocyte donors in a preliminary phone call. Am J Bioeth. 2001;1(4):3–13.
25. Pearson H. Health effects of egg donation may take decades to emerge. Nature. 2006;442(7103):607–8.
26. The Practice Committee of the American Society for Reproductive Medicine. Repetitive oocyte donation. Fertil Steril. 2008;90 Suppl 3:S194–5.
27. Ethics Committee of The American Society For Reproductive Medicine. Financial compensation of oocyte donors. Fertil Steril. 2007;88(2):305–9.
28. Daniels K. Donor gametes: anonymous or identified? Best Pract Res Clin Obstet Gynaecol. 2007;21(1):113–28.
29. Murray TH. New reproductive technologies and the family. In: Cohen C, editor. New ways of making babies: the case of egg donation. Bloomington and Indianapolis: Indiana University Press; 1996. p. 51–69.
30. Human Fertilisation and Embryology Authority. Donor compensation, reimbursement and benefits in kind. 2012 [cited 2012 October 30]. http://www.hfea.gov.uk/6177.html.
31. Robertson JA. Compensation and egg donation for research. Fertil Steril. 2006;86(6):1573–5.
32. Levine AD. Self-regulation, compensation, and the ethical recruitment of oocyte donors. Hastings Cent Rep. 2010;40(2):25–36.
33. Daniels CR, Heidt-Forsythe E. Gendered eugenics and the problematic of free market reproductive technologies: sperm and egg donation in the United States. Signs. 2012;37(3):719–47.
34. Baum K. Golden eggs: towards the rational regulation of oocyte donation. Brigh Young Univ Law Rev. 2001;1:107–66.
35. American Society for Reproductive Medicine. 2006 guidelines for gamete and embryo donation. Fertil Steril. 2006;86(5):S38–50.
36. Gurtin ZB, Ahuja KK, Golombok S. Egg-sharing, consent and exploitation: examining donors' and recipients' circumstances and retrospective reflections. Reprod Biomed Online. 2012;24(7):698–708.
37. Heng BC. Ethical issues in transnational "mail order" oocyte donation. Int J Gynecol Obstet. 2006;95(3):302–4.
38. Waldby C. Oocyte markets: women's reproductive work in embryonic stem cell research. New Genet Soc. 2008;27(1):19–31.
39. Nahman M. Reverse traffic: intersecting inequalities in human egg donation. Reprod Biomed Online. 2011;23(5):626–33.
40. Heng B. Legal and ethical issues in the international transaction of donor sperm and eggs. J Assist Reprod Genet. 2007;24(4):107–9.
41. Sauer MV. Indecent proposal: $5,000 is not "reasonable compensation" for oocyte donors. Fertil Steril. 1999;71(1):7–10.
42. The Ethics Committee of the American Society for Reproductive Medicine. Oocyte donation to postmenopausal women. Fertil Steril. 2004;82 Suppl 1:S254–5.
43. Craft I, Flyckt S, Heeley G, Layland S, Thornhill A, Kelada E. Will removal of anonymity influence the recruitment of egg donors? A survey of past donors and recipients. Reprod Biomed Online. 2005;10(3):325–9.
44. Ahuja KK, Simons EG, Nair S, Rimington MR, Armar NA. Minimizing risk in anonymous egg donation. Reprod Biomed Online. 2003;7(5):504–5.
45. Shenfield F, Steele SJ. What are the effects of anonymity and secrecy on the welfare of the child in gamete donation? Hum Reprod (Oxford, UK). 1997;12(2):392–5.
46. Readings J, Blake L, Casey P, Jadva V, Golombok S. Secrecy, disclosure and everything in-between: decisions of parents of children conceived by donor insemination, egg donation and surrogacy. Reprod Biomed Online. 2011.
47. De Jonge C, Barratt CLR. Gamete donation: a question of anonymity. Fertil Steril. 2006;85(2):500–1.
48. Ethics Committee of the American Society for Reproductive Medicine. Informing offspring of their conception by gamete donation. Fertil Steril. 2004;81(3):527–31.
49. Kalfoglou AL, Geller G. A follow-up study with oocyte donors exploring their experiences, knowledge, and attitudes about the use of their oocytes and the outcome of donation. Fertil Steril. 2000;74(4):660–7.

50. Kalfoglou AL, Gittelsohn J. A qualitative follow-up study of women's experiences with oocyte donation. Hum Reprod. 2000;15(4):798–805.
51. Kalfoglou AL, Geller G. Navigating conflict of interest in oocyte donation: an analysis of donors' experiences. Women Health Issues. 2000;10: 226–39.
52. Dickens BM, Cook RJ. Conflict of interest: legal and ethical aspects. Int J Gynecol Obstet. 2006;92:192–7.
53. Berg JW. Risky business: evaluating oocyte donation. Am J Bioeth. 2001;1(4):18.
54. Dickenson D. Property in the body: feminist perspectives. Cambridge and New York: Cambridge University Press; 2007.

Part II

Gestational Surrogacy

Gestational Carrier: Medical Aspects

5

James M. Goldfarb

What Is a Gestational Carrier?

A gestational carrier is a woman who is carrying a baby who is not genetically related to her. The intent of the gestational carrier getting pregnant is to enable a couple or individual who cannot carry a pregnancy to have a baby who is genetically related to the couple or individual. It is important to differentiate gestational carrier from what is called "traditional surrogacy." In "traditional surrogacy," a woman is inseminated with sperm and carries a baby who is genetically hers; this is in contrast to a gestational carrier, who carries a baby with whom she has no genetic relationship.

History

The first birth utilizing a gestational carrier occurred in April 1986 [1]. The biological parents had a long history of infertility. The wife had lost both of her fallopian tubes to ectopic pregnancies. In 1981, the couple went to Bourn Hall in England to attempt in vitro fertilization (IVF). At that time, Bourn Hall had the most experience in the world with IVF. The couple did conceive with IVF at Bourn Hall. However, at about 22 weeks' gestation, the wife's uterus ruptured. The uterine rupture caused the baby to die and the wife to undergo a hysterectomy. The husband, a New Jersey cardiologist, realized that his sperm and his wife's eggs were obviously able to conceive a pregnancy. In 1984, he and his wife inquired of several fertility centers that had successful IVF programs at that time, whether it would be feasible to have embryos conceived with their sperm and eggs implanted into another woman's uterus. Physicians at the Mount Sinai Medical Center in Cleveland, Ohio, found the proposal to be very interesting and challenging. The physicians contacted the couple and told them they were, from a scientific standpoint, very interested in their proposal. They were, however, concerned about the ethical and legal issues. They did offer the couple the opportunity to come to Mount Sinai to further evaluate their proposal. The couple had consulted a lawyer and brought a large amount of legal documentation to Mount Sinai. The couple met with the Mount Sinai Ethics Committee and the Mount Sinai Institutional Research Board. After long deliberations, the Ethics Committee and the Institutional Review Board both approved the proposal for this one case.

The logistics of coordinating the cycles of the biological mother and the gestational carrier were much more complex at that time than

J.M. Goldfarb, M.D., M.B.A. (✉)
Fertility Services and In Vitro Fertilization,
University Hospitals of Cleveland,
Cleveland, OH, USA,

Clinical Professor of Reproductive Biology Case,
Western Reserve University, Cleveland, OH, USA
e-mail: James.Goldfarb@UHhospitals.org

J.M. Goldfarb (ed.), *Third-Party Reproduction: A Comprehensive Guide*,
DOI 10.1007/978-1-4614-7169-1_5,

they are now. The current logistics will be discussed later in this chapter, including the use of gonadotropin-releasing hormone agonists (GnRHa), which now greatly simplifies the coordination of the cycles of the biological mother and the gestational carrier. Because of the difficulty coordinating the cycles of the biological mother and the gestational carrier at that time, the first two attempted cycles had to be canceled because of the lack of ability to coordinate the cycles. The first gestational carrier became discouraged and was not willing to attempt a third cycle. A second gestational carrier was chosen, and the first cycle with this carrier was sufficiently coordinated to proceed and was successful. The baby was born in April 1986 and made history not only as the first baby born by a gestational carrier but also as the first baby to be legally handed over to a non-birth mother without having to be adopted. During the pregnancy, the biological parents had obtained a court order declaring them as the legal parents and stating that their names should be on the birth certificate. The baby was featured on the cover of LIFE Magazine in April 1987, in honor of her first birthday. She graduated from Emory University in 2008 and currently lives in New York City.

Utilization of Gestational Carriers in the United States

There is a slight upward trend in the use of gestational carriers in the USA (Table 5.1). In 2010, there were 875 gestational carrier cycles in which the biological parents used the biological mother's eggs and 734 gestational carrier cycles in which donor eggs were used. Gestational carrier services are not legal in many countries. Therefore, many couples needing gestational carrier cycles come to the USA. According to the Society for Assisted Reproductive Technologies (SART) data, about 15 % of gestational carrier cycles involve couples who are not residents of the USA (Table 5.2). In some states, because of very restrictive laws, there are significant barriers to providing gestational carrier services. Despite this, 84 % of SART clinics state that they offer gestational carrier services [2]. Gestational carrier services are utilized far less than the most utilized third-party reproduction, oocyte donation. In 2010, there were a total of 1,609 gestational carrier cycle starts (including use of biological mother's eggs and donor eggs). In contrast, there were 8,097 transfers involving donor eggs [3].

Table 5.1 Utilization of gestational carriers in the USA[a]

	Own eggs	Donor eggs	Total
2008	852	707	1,559
2009	839	728	1,567
2010	875	734	1,609

[a]SART 2008–2010 IVF success rate report

Table 5.2 Non-US resident utilization of gestational carriers in the USA[a,b]

2008	18 %
2009	13 %
2010	15 %

[a]SART 2008–2010 IVF success rate report
[b]Fresh non-donor egg cycles

Indications for Usage of Gestational Carriers

The indications for usage of gestational carriers are listed in Table 5.3. The classic indication for the use of a gestational carrier is women with no uterus either because they have had a hysterectomy or were born without a uterus. Clearly, some women with abnormal uteruses (either congenital or acquired) benefit from the use of a gestational carrier. However, especially if the abnormality is not extensive, one must do a thorough evaluation for other factors that may be preventing conception or causing miscarriages.

Because of the physiological changes that occur during pregnancy, certain diseases will be of significant risk to a pregnant patient. In these cases, the use of a gestational carrier may be medically indicated. Examples include severe renal disease, severe diabetes, and compromised cardiac function.

Our initial experience indicated that previously failed IVF cycles were not an indication for

Table 5.3 Gestational carrier indications

Absent uterus
Congenital
Surgical
Abnormal uterus
Medical disease
Failed IVF
Recurrent miscarriage
Poor OB history
Same-sex male couples/single men

the use of a gestational carrier [4]. However, with further experience, the use of a gestational carrier does seem to be efficacious in selected women with multiple failed IVF cycles. For example, we had a couple come to us who had five failed IVF cycles, all of which had been done in good programs and all of which had good-quality embryos to transfer. The woman then conceived twice in our program, but both times the initial ultrasound showed a slow heartbeat, and she miscarried shortly after the initial ultrasound. Extensive evaluation for recurrent miscarriage was negative. The couple then went through two gestational carrier cycles, resulting in two normal pregnancies with the gestational carrier. This patient's history was very impressive; therefore, the decision to use a gestational carrier was a rather easy one. There are, however, many couples with repeated failed IVF for whom a gestational carrier may not be as clearly indicated. The clinician may, in these cases, feel a gestational carrier would improve the chances for success. However, it is important that the expected incremental improvement in the chance for success is of a large enough magnitude to justify all that goes into using a gestational carrier.

Similarly, in couples with recurrent miscarriage, it is important to fully evaluate the couple for all causes of recurrent miscarriage. If, after thorough evaluation, it is felt that the couple would have a lower chance of recurrent miscarriage through the use of a gestational carrier, then it is again important that the expected incremental increased chance justifies the use of a gestational carrier.

Women who have had extremely poor obstetrical histories are good candidates for the use of a gestational carrier. Women who have had issues such as significantly premature deliveries and/or significant medical problems that are likely to recur are likely to benefit from the use of a gestational carrier.

Single men and same-sex male couples can utilize a gestational carrier as a way to have a family. As will be discussed in the chapter on legal issues with use of a gestational carrier, it is important to have the gestational carrier procedure in a state that is generally "gestational carrier friendly" and also does not discriminate against single males and same-sex male couples in regards to the use of gestational carriers.

The Treatment Cycle

During a routine in vitro fertilization cycle, the woman is given gonadotropins ("fertility shots") to stimulate her ovaries to make multiple eggs (in contrast to the one egg that is developed in a normal menstrual cycle). The response to the fertility shots is monitored with ultrasounds and blood tests for estradiol (estrogen) levels. When it is determined by this monitoring that the ovaries have developed eggs that are ready to be matured, a final injection, human chorionic gonadotropin (hCG), is given to finalize the maturation of the eggs. hCG will cause the ovary to release the matured eggs in somewhat over 40 h from the time the injection is given. The eggs are removed from the ovary approximately 36 h after the hCG injection is given. Thirty-six hours is chosen because it provides enough time for the eggs to mature but not be released from the ovary. The eggs are removed from the ovary by a very minor surgical procedure, ultrasound-guided egg retrieval. This procedure is done under the same type of intravenous sedation as is used in colonoscopies, D&Cs, and other minor surgical procedures. The procedure itself generally takes less than 20 min, and the patients can go home within an hour of having the procedure completed.

During a routine IVF cycle, the hormonal changes that result from the fertility shots prepare the endometrium (lining of the uterus) to be receptive to embryos. In a gestational carrier cycle, it is imperative for the gestational carrier's

endometrium to be prepared to be receptive to the embryos that are going to be put into her uterus. As mentioned in the history of the world's first gestational carrier case, if the lining of the gestational carrier's uterus is not receptive, embryos cannot be transferred. While synchronization of the gestational carrier's endometrium with the time of embryo transfer was a significant challenge in the early days of gestational carrier, it is no longer problematic.

The first thing that needs to be done in preparation for synchronizing the cycles of the gestational carrier and biological mother is to assess the biological mother's ovarian reserve in order to establish a protocol for stimulation of her ovaries that will allow her to produce an appropriate amount of eggs. This can be done by blood tests on day 3 of her menstrual cycle for follicle-stimulating hormone (FSH) and estradiol levels and/or anti-Müllerian hormone levels. In addition, ultrasound can be done to determine the number of antral follicles (antral follicle count). In general, once a protocol is established for the biological mother, the gestational carrier is started on a gonadotropin-releasing hormone agonist (GnRHa), most commonly leuprolide, which stops the pituitary from stimulating the ovaries, so that her ovaries become inactive. Because the ovaries are inactive, there are no ovarian hormones to stimulate the endometrium. Thus, exogenous hormones can be given to stimulate the endometrium, so that the endometrium will be receptive when the embryos are transferred to the gestational carrier.

There are many treatment regimens for stimulating the gestational carrier's endometrium. Our current protocol uses 2 mg of oral estradiol three times per day. We generally start the estradiol about 2 days before we start the biological mother on her gonadotropins. The response of the endometrium is measured by transvaginal ultrasound after 10–11 days of the oral estradiol. If the thickness of the endometrium is less than 8 mm, 2 mg of vaginal estradiol is added twice daily. On the day of the egg retrieval, intramuscular progesterone 50 mg per day is added (unless the gestational carrier is over 39 years old, in which case 100 mg of intramuscular progesterone is added). While we still tend to prefer intramuscular progesterone, many programs primarily use vaginal progesterone. In cases for which we use vaginal progesterone, we use vaginal progesterone inserts, 100 mg three times a day, starting the day after the egg retrieval (in contrast to the day of egg retrieval, with intramuscular progesterone).

Table 5.4 Implantation rates for gestational carriers (GC) as related to age of biological mother[a]

Age of biological mother	<35	35–37	38–40	41–42	>42
Implantation rate of GC (%)	42	34	22	11	6.5

[a]Adapted from SART 2010 IVF success rate report

Embryo transfer to uterus of the gestational carrier is done 3 or 5 days after the egg retrieval. Embryo transfer is done under ultrasound guidance. The embryos are placed in a flexible catheter. We use the Wallace catheter, which is the most commonly used embryo transfer catheter. The major factor determining the number of embryos to transfer is the age of the biological mother. As can be seen (Table 5.4), the implantation rates (the chance of an embryo successfully implanting in the gestational carrier's uterus) are greatly influenced by the age of the biological mother. The American Society of Reproductive Medicine (ASRM) provides guidelines as to the maximum number of embryos to transfer during routine in vitro fertilization cycles [5]. It is generally suggested that clinicians be conservative in the number of embryos transferred to gestational carrier because of the higher implantation rates. Even more important is the significantly increased risk of premature labor with multiple pregnancies. Premature labor is most often treated with prolonged bed rest, which would impact the gestational carrier's daily life.

Success Rates with Gestational Carriers

As mentioned previously the success rates with gestational carriers are impacted greatly by the age of the biological mother. It can also be seen

Table 5.5 Live birth rates for IVF patients and gestational carriers (GC)[a]

Percent live births per embryo transfer 2010					
	<35	35–37	38–40	41–42	>42
IVF	48	38	28	17	6.3
GC	56	45	37	20	6.0

[a]SART 2010 IVF success rate report

Table 5.6 Frozen embryo success rates[a]

	GC using biological mother eggs (%)	GC using donor eggs (%)	Infertile women using donor eggs (%)
2008	28	35	33
2009	32	35	34
2010	33	37	35

[a]SART 2008–2010 IVF success rate report

that the success rates for all age groups, except the very oldest, are higher with gestational carriers than with IVF in general (Table 5.5). There are many possible reasons for this. All gestational carriers have had previous pregnancies, in contrast to many IVF patients, who have never been pregnant. Having had a successful pregnancy in the past seems to increase the chances for another successful pregnancy. In addition, it is postulated that the medications given to stimulate the gestational carriers' endometrium may result in a more receptive endometrium than that of women going through routine IVF. This postulation is supported by comparing the success rates of frozen embryo transfers in cases in which donor eggs were used in gestational carrier cycles versus donor eggs not utilizing a gestational carrier (Table 5.6). The same medication protocols are used to prepare the endometrium in both of these groups. Because donor eggs were used in both, it can be assumed the egg donors were of comparable ages. Obviously, many of the non-gestational carrier egg recipients have never been pregnant, whereas essentially all the gestational carriers have had successful pregnancies. Despite this, the gap between the success rates of the gestational carrier and the other egg recipients is much less than when fresh embryos are used. This supports the postulation that the stimulation used to prepare the recipient's endometrium is more efficacious than the stimulation used in routine IVF cycles.

Screening Participants in Gestational Carrier Cycles

Screening of the Biological Parents

The most important screening of the biological mother and her partner/husband is to make sure they are completely comfortable with the concept of a gestational carrier and are completely comfortable with the gestational carrier who will be carrying their baby. The couple needs to have psychological clearance by personnel who are familiar with the issues surrounding third-party reproduction. From a medical standpoint, it must be determined that the biological mother's ovaries are capable of producing eggs. As discussed previously, this can be done by a combination of blood tests (AMH level and/or day 3 FSH, estradiol levels) and/or ultrasound determination of number of antral follicles. The ovaries should also be assessed as to their anatomic position. The vast majority of the time, the ovaries are in a position to be accessible vaginally; therefore, the usual vaginal ultrasound-directed procedure can be done to obtain the eggs. If the biological mother has had a hysterectomy, the ovaries occasionally are positioned during the surgery in such a way that they are not accessible vaginally. In this situation, the ovaries can generally be accessed through the abdominal wall under ultrasound direction. This is a more difficult approach to the ovaries but generally can be done successfully [6]. The other category of women who may likely have ovaries that are difficult to access are women who have been born without a uterus (Müllerian agenesis). These patients have very short vaginas, and their ovaries tend to be higher in the pelvic cavity than women who have a uterus. This combination often makes vaginal retrieval impossible. In this situation, as in some women with hysterectomy, ultrasound-guided abdominal retrieval is sometimes needed.

Screening the Gestational Carrier

As with the biological parents, it is imperative that the gestational carrier and her family be completely comfortable with the process and risks. In particular, the gestational carrier must be aware of, and comfortable with, the risks of multiple pregnancies, especially if it is planned that more than one embryo will be transferred. The gestational carrier should also be aware that even if only one embryo is transferred, there is an approximately 1 % chance of twins because a single embryo can split, resulting in identical twins [7]. It is imperative that the gestational carrier has had a previous normal pregnancy. This is important not only for medical/obstetrical reasons but also for psychological reasons. A woman who has not had a previous pregnancy will not be aware of the attachment and bonding that occurs during a pregnancy. The gestational carrier must also have psychological counseling by personnel who are familiar with the issues surrounding third-party reproduction.

From an obstetrical standpoint, there are increased chances for complications for women who have had a large number of deliveries. Therefore, it is the recommendation of the ASRM that the gestational carrier should not have not had more than a total of five previous deliveries and no more than three deliveries by cesarean section [8]. The gestational carrier obviously must have no medical conditions that might complicate a pregnancy or be exacerbated by a pregnancy. Imaging of the gestational carrier's uterus to confirm the absence of polyps, fibroids, and so forth should be done because these conditions can decrease the chance of a successful pregnancy. The gestational carrier needs to be using effective contraception during the process.

When couples are using a known gestational carrier, careful screening must be done to assure there is no element of coercion.

Necessary Talking Points for the Biological Parents and Gestational Carrier

Several critical issues must be discussed by the biological parents and the gestational carrier. While there are no "right or wrong" answers to these issues, the answers of the gestational carrier and the biological parents must be the same. The clinician must present the following issues to the biological parents and the gestational carrier:

1. Number of embryos to transfer. Many of the gestational carriers have had normal singleton pregnancies and may be concerned about multiple pregnancies. Especially when the biological mother is young, it is prudent to recommend transfer of only one embryo to the gestational carrier. However, if for any reason the biological parents want more than one embryo transferred, it is imperative that, after being fully informed of the risks of multiple pregnancies, the gestational carrier is comfortable with transferring more than one embryo.
2. Selective fetal reduction. If there is a multiple pregnancy, the gestational carrier and the biological parents must agree on whether selective reduction would be done. This situation would most commonly arise when an embryo "splits," resulting in identical twins. An example of this would be when two embryos are transferred, both implant and one splits, resulting in a triplet pregnancy.
3. Genetic screening and response to positive screening. It is now recommended that women of all ages consider genetic and anatomic screening during pregnancy. The biological parents and the gestational carrier must agree on whether this screening will be done. They must also agree on whether the pregnancy would be terminated if significant genetic and/or anatomic abnormalities were noted.

The aforementioned issues must not only be discussed but must also be part of the contract between the biological parents and the gestational carrier. As will be discussed in the chapter on legal issues regarding the use of a gestational carrier, it is imperative that the gestational carrier and biological parents have *separate, independent* legal counseling.

Sources of Gestational Carriers

There are many sources of gestational carriers used by biological parents. Most commonly, the biological parents use agencies to find gestational carriers. Some will advertise and some use

women known to them. We have had biological parents use relatives, including mothers. We have also had couples use friends, neighbors, and other acquaintances. No matter what the source of the gestational carrier, it is imperative for the physician to emphasize to the gestational carrier that she is a patient who is as important as any other patient in the practice, including the biological mother. She should be reassured that if she decides she does not want to proceed at any time before the embryo transfer, her decision will be fully supported by the entire medical team.

The FDA and Gestational Carrier

The FDA has established eligibility standards for third-party reproduction. Since May 2005, all infertility centers have to comply with these standards. The FDA requires the following for the biological parents:

1. A specific medical questionnaire to be filled out by both the biological parents within 6 months of the time the biological mother's eggs are retrieved. This questionnaire is designed to assess the couple for risks of communicable diseases.
2. A specific physical exam for both of the biological parents within 6 months of the sperm collection for the male and within 6 months of the egg retrieval for the female. These physicals are designed to look for signs of communicable diseases.
3. Specific laboratory tests for communicable diseases. For those tests for which there are FDA-licensed tests available, FDA-licensed tests must be used. The tests must be drawn for the biological mother within 28 days of egg retrieval. Generally, the biological mother has her tests drawn at the initial consultation to confirm there are no abnormalities. Almost always the egg retrieval will be more than 28 days from the initial consult, necessitating the biological mother to have these tests done twice. The biological father must have these laboratory tests drawn within 7 days of when his sperm is collected. Because of this narrow window, most programs freeze the biological father's sperm on the day of initial consultation, at which time the laboratory tests are drawn. The frozen sperm is then thawed on the day of egg retrieval and used for fertilizing the biological mother's eggs. Thus, the biological father needs to have these tests done only once.

Interestingly, the FDA does not require any of the above screening procedures for the gestational carrier. However, if the gestational carrier were to have a communicable disease, it would be much more likely for the gestational carrier to transmit that disease to the baby she is carrying than it would for sperm and eggs to transmit a disease to the gestational carrier. Therefore, programs screen the gestational carrier extensively for communicable diseases, even though it is not required by the FDA.

If the biological mother or biological father has any positive findings in any of the aforementioned screening procedures, the biological mother and/or biological father is considered to be an ineligible donor. However, the positive findings do not necessarily prevent the biological mother and/or the biological father from participating in the gestational carrier program. The gestational carrier and the biological parents have generally met before initial consultation regarding the gestational carrier process. Therefore, the fertility programs generally consider the biological mother and biological father to be "directed donors." Because they are "directed donors," the FDA allows them to participate as long as the gestational carrier is informed of any positive screening tests and signs a document that she knows of the positive tests and their potential sequelae. A common example of this situation is when the biological parents come from Europe to utilize a gestational carrier. One of the questions in the medical questionnaire is "Since 1980 have you spent time that adds up to 5 years or more in Europe (including time spent in the UK) between 1980 and 1996?" This question is asked because of the concern for the biological parents having bovine spongiform encephalopathy (mad cow disease). Clearly, the European couple's answer would be "yes." This positive answer would make the couple an "ineligible donor." However, as discussed previously, the gestational carrier process can proceed as long as the gestational carrier signs a document that she knows the couple is considered "ineligible donors."

An exception is made to the screening requirements in situations where embryos that are to be transferred to the gestational carrier were not planned to be transferred to a gestational carrier at the time they were made. This occurs when a couple goes through IVF, with a plan to transfer embryos to the biological mother, but sometime in the future, it is decided that frozen embryos made in that cycle are going to be transferred to a gestational carrier. This would occur, for example, if the biological mother has a hysterectomy and has frozen embryos from an IVF cycle done before her hysterectomy. This would also occur if a woman went through IVF, had embryos transferred to her, and then had pregnancy complications that would preclude her having a second pregnancy with the embryos frozen at the time of her IVF cycle. In these situations, the biological parents are asked to provide all the information and blood tests that are required of biological parents. The gestational carrier then acknowledges that the information and tests were not obtained in the usual time frames required for biological parents.

Embryo Freezing Before Gestational Carrier Cycles

There are some situations in which rather than utilizing fresh embryos for the initial gestational carrier cycle, the plan is for all embryos to be frozen and then transferred to a gestational carrier in the future. We recommend this approach if there is significant concern that the biological mother may not be able to make a sufficient number of eggs. Before a gestational carrier enters the treatment cycle, the biological parents have significant costs, particularly legal costs that are generally more than $10,000. Thus, if the gestational carrier process is started and the biological mother does not produce sufficient eggs, the biological parents would have spent a great deal of money and have little or no chance for success. In these cases, we generally advise the biological mother to go through the egg-stimulation procedure and have the resulting embryos frozen. If there are sufficient embryos frozen to warrant the costs of the gestational carrier procedure, the biological parents can then start the legal, psychological, and medical procedures to prepare for a gestational carrier cycle. The frozen embryos would then be thawed and transferred to the gestational carrier.

A situation that very occasionally necessitates freezing embryos before a gestational carrier cycle is when a biological mother is going to have her uterus and ovaries removed owing to, for example, extremely severe endometriosis, but is not ready yet to have children.

Occasionally, the gestational carrier's endometrium does not respond to the medication used to prepare it for embryo transfer. In these cases, the biological parents' embryos can be frozen and another protocol can be used to attempt to stimulate the gestational carrier's endometrium to be receptive to the embryos. If the new protocol does stimulate the gestational carrier's endometrium appropriately, the embryos can be thawed and transferred.

Gestational Carrier Combined with Egg Donation

According to the SART database, over 40 % of gestational carrier cycles in 2010 involved the use of donor eggs [3]. This situation would arise if the woman of the infertile couple has reasons to use a gestational carrier but would not be able to produce eggs that would result in a pregnancy. Thus, the gestational carrier would be carrying a pregnancy that is genetically half the egg donor and half the husband of the infertile couple. Single men and same-sex male couples also utilize a gestational carrier combined with egg donation. Rarely, an infertile couple has reason to use a gestational carrier but has neither functional sperm nor functional eggs. Obviously, this couple could use a sperm donor and an egg donor, with the resulting embryos placed into the gestational carrier. Alternatively, this couple could use a donor embryo, as described in the chapter "Embryo Donation: Medical Aspects."

Conclusion

Gestational carrier programs clearly have many pitfalls that must be carefully addressed, but these programs give couples a chance to have the genetic baby they so deserve.

References

1. Utian WH, Sheean L, Goldfarb JM, Kiwi R. Successful pregnancy after in vitro fertilization and embryo transfer from an infertile woman to a surrogate. N Engl J Med. 1985;313(21):1351–2.
2. 2010 CDC Fertility Success Rate Report. http://www.cdc.gov/art/.
3. 2010 SART Fertility Success Rate Report. http://www.sart.org/SART_Success_Rates.
4. Utian WH, Goldfarb JM, Kiwi R, Sheean LA, Auld H, Lisbona H. Preliminary experience with in vitro fertilization—surrogate gestational pregnancy. Fertil Steril. 1989;52:633–8.
5. The Practice Committee of the American Society for Reproductive Medicine and the Practice Committee of the Society for Assisted Reproductive Technology. Criteria for number of embryos to transfer: a committee opinion. Fertil Steril. 2012;99:44–6.
6. Barton SE, Politch JA, Benson CB, Ginsburg ES. Transabdominal follicular aspiration for oocyte retrieval in patients with ovaries inaccessible by transvaginal ultrasound. Fertil Steril. 2011;95:1773–6.
7. Vitthala S, Gelbaya TA, Brinson DR, Fitzgerald CT, Nardo LG. The risk of monozygotic twins after assisted reproductive technology: a systemic review and meta-analysis. Hum Reprod Update. 2009;15:45–55.
8. American Society for Reproductive Medicine. Recommendations for practices utilizing gestational carriers: an ASRM Practice Committee guideline. Fertil Steril. 2012;97:1301–8.

Surrogacy and Gestational Carrier Arrangements: Legal Aspects

6

Margaret E. Swain

Introduction

The very word "mother" evokes powerful instincts and emotions. With very few exceptions, not until the recent past has the word been open to interpretation at the most basic legal level.

Matters involving parental rights are decided at the state level, and the minutiae of these laws vary greatly among the states. Regardless, the courts have generally been charged with deciding one of two things: which of two battling parents is the *better* choice to have custody of a child or, between a birth parent and an adoptive parent, who is the *best* candidate to be the parent. With the advent of surrogacy, and its sometime partner, egg donation, the question becomes fundamentally different: not who is better or best, but simply *who is* the parent?

Historical Background: Traditional Surrogacy

Until the mid-1980s, surrogacy in the context of family building meant an arrangement where a woman underwent insemination using sperm of a man who was not her spouse, but who intended to parent the resultant child. Possibly the intended and genetic father was married, in which case his wife, who might be called the intended mother, would plan to adopt her husband's child. If the intended father was single, or in a same-sex partnership, the termination of the surrogate's parental rights was more complicated. In any case, absent the rare statute to the contrary, a surrogate of this type (a "traditional surrogate") had parental rights to the child, as she was both the genetic and gestating mother. As a parent, unless applicable law stated otherwise, she was entitled to assert parental rights and not consent to any subsequent adoption, despite a contractual agreement to do so. The widely publicized *Baby M*. case [1] prompted many jurisdictions to enact laws that prohibited surrogacy altogether, criminalized participation and/or imposed civil penalties in surrogacy arrangements, otherwise restricted its practice (usually to situations where the surrogate was not compensated), or made any surrogacy agreement unenforceable. As of this writing, there are six states in which the enforcement of surrogacy contracts is prohibited by statute [2, 3].

While traditional surrogacy is undeniably more affordable, and medically is far less complicated, than gestational surrogacy, it is not widely practiced. Even in states where there are no restrictive or prohibitive statutes, there is little legal certainty as to the ultimate outcome of these matters. In the absence of a statute specifically enforcing surrogacy contracts (or very specific case law), the genetic and gestational relationship

M.E. Swain, R.N., J.D. (✉)
The Law Office of Margaret E. Swain, Towson, MD 21204, USA
e-mail: swainlegal@gmail.com

J.M. Goldfarb (ed.), *Third-Party Reproduction: A Comprehensive Guide*,
DOI 10.1007/978-1-4614-7169-1_6,

of the traditional surrogate to the child allows her to assert parental rights, even in direct contravention of contractual promises. The ultimate decision as to who should have custody of the child turns on what is in the best interest of the child. Absent a determination of unfitness, it is exceedingly difficult to terminate parental rights over the objection of a parent. Further, if an adoption is planned to terminate the rights of the surrogate, a paid surrogacy agreement for gestational services may violate the state adoption code. These reasons, along with the difficult psychological issues, have caused traditional surrogacy to virtually disappear: one author has estimated that, in surrogacy matters in which an attorney has been consulted, fewer than 5 % of those cases involve traditional surrogates [3].

Surrogacy Case Law Survey

Child custody matters are usually decided by state, rather than federal, courts and are generally handled at the trial court level. As such, the case decisions are not published and may not be reported. Additionally, the pleadings and decisions are likely to be sealed and not available for public inspection. It is only when a disputed case is appealed that a decision is published (although not every mid-level opinion is published). As a consequence, it seems that only the most sensational cases, with the most difficult facts, come within the sphere of public awareness. The most visible of the traditional surrogacy cases is the *In re Baby M* matter. There, a woman agreed, by contract, to be inseminated with sperm from the intended (and genetic) father and to carry the child, give birth, and place the child with the father and his wife. The surrogate had a change of heart during the pregnancy and refused to relinquish the baby. The father sued for custody, and the New Jersey Supreme Court, in declaring both the surrogate and the father parents, ruled that the surrogacy contract was unenforceable and void as against public policy. Applying the "best interest of the child" standard, the genetic father and his wife were granted custody, and the surrogate was granted visitation rights [1]. A similar result was reached in *RR. v. M.H.*, wherein the court outlined situations in which a surrogacy agreement might be enforceable but noted that a best interest determination could not be made by private agreement and could only be established by judicial intervention. The court specifically applied the adoption laws of Massachusetts and noted that since the 4-day waiting period for adoption consent had not been afforded to the surrogate, the agreement violated state law [4]. *In re Marriage of Moschetta* involved married, intended parents who divorced within days of the birth of the child through traditional surrogacy. The surrogate, in learning of the divorce, refused to give custody of the child to the commissioning couple. The court held that the genetic and biological parents were the legal parents of the child and, in effect, viewed the intended mother as a legal stranger [5]. *Doe v. Doe* also involved a custody dispute in a surrogacy matter, but the competing parties were the genetic father and intended, but not genetic, mother. The couple used a traditional surrogate via home (syringe) insemination and then convinced the surrogate to assume the identity of the intended mother when she delivered the child. The intended mother's name was thus placed on the birth certificate. The child was never adopted by the intended mother and the rights of the surrogate, and her husband, were not terminated. When the intended mother and the genetic father divorced, the court found that the child was not a child of the marriage and the intended mother was not a parent. However, the court determined that she was a third party who was entitled to consideration for custody of the child, as she had raised her for over a decade [6].

Historical Background: Gestational Surrogacy

The possibility of a birthing woman who was genetically unrelated to the child she delivered did not exist prior to the development of in vitro fertilization (IVF). Gestational surrogacy (often referred to as "gestational carrier arrangements," to distinguish them from "true" or "traditional" surrogacy) produced the first reported birth in 1985 [7].

The number of these types of births was estimated to be greater than 1,400 in 2010, a twofold increase from 2004 [8].

The use of a gestational carrier allows prospective parents to produce a child from their own genetic material (or, as the case may be, using a donor gamete or gametes) and, through intent and judicial or statutory process, be declared the legal parents, even though another woman gives birth. The absence of the gestational surrogate's genetic link to the child permits, in many jurisdictions, recognition of the parental rights of the intended parents without the necessity of an adoption or other means to terminate presumed rights of the gestational surrogate. While not every state permits this arrangement, the legal framework continues to develop and evolve.

Gestational Surrogacy Case Law Review

In 1990, only about 5 years after the birth of the first child through gestational surrogacy, a dispute between intended parents and their gestational carrier was litigated, and the decision appealed to the Supreme Court of California, which considered the matter in 1993. There, the court posited three questions: (1) When the commissioning couple each provide the genetic material used to create an embryo and that embryo is implanted into another woman for gestation, who is the "natural mother" of the resultant child under California law? (2) Are the constitutional rights of the gestational carrier offended by a determination that the provider of the egg and the intended mother is the "natural" mother? (3) Is such a determination a violation of the public policy of California? The facts of the case are straightforward. In 1990, the parties (Mark and Crispina Calvert and the surrogate, Anna Johnson) signed a gestational surrogacy contract. Anna agreed to waive any rights to the child, and Mark and Crispina agreed to pay her $10,000 in installments. The relationship between the Calverts and Anna deteriorated, and eventually, Anna notified the Calverts that unless they paid her the total amount promised in advance, she would refuse to hand over the child upon birth. The Calverts sued for a determination of parentage in their favor, which was obtained at trial. Anna appealed, the decision was affirmed, and the Supreme Court accepted it for review. After reviewing the Uniform Parentage Act (a parent/child relationship *may* be established by proof of the woman as having given birth, but also, genetic testing is evidentiary in disputed paternity and maternity), and the intent evidenced in the written surrogacy agreement, and finding that adoption laws did not apply, the court concluded that Crispina Calvert was the natural mother of the child, that Anna Johnson was not, that the arrangement was not violative of the public policy of California, and that Anna's constitutional rights were not abridged by the decision [9]. Shortly thereafter, the Ohio Court of Common Pleas relied upon genetics in determining that an intended, genetic mother of a child gestated by the mother's sister was the legal mother. The court declined to recognize intent as a determining factor, indicating that intent may not be clear in any given case. The court allowed that birthing a child could be evidentiary, but as compared to genetics, it was not probative [10].

The notion that parentage could only be established by genetics or gestation was challenged by a 1998 California case involving married, intended parents who created an embryo with donor gametes and arranged to have the embryo implanted in a gestational surrogate. The pair then parted, and the wife, Luanne, claimed that her ex-husband, John, was a parent and, therefore, responsible for child support. At trial, the court concluded that the child, Jaycee, had no parents: the gestational carrier was not claiming to be a parent, and neither intended parent had a genetic or gestational connection to Jaycee. On appeal, the court concluded that the trial court, in deciding that parenthood could only be established through genetics or gestation and birth, had erred. The appeals court drew an analogy to determination of paternity in donated sperm matters, demonstrating how a man can be a legal parent with no other tie to the child except intent. The court here established that consent to engage

in a gestational carrier arrangement, even without a genetic or gestational link, is sufficient to allow a determination of parentage [11].

In the *R.R. v. M.H.* case of 1998, the Massachusetts court applied adoption law to a traditional surrogacy case [3], but in 2001, it reached a different conclusion when deciding a gestational carrier matter. There, the court concluded that since the carrier was not genetically related to the child and that the intended parents had not donated their gametes to the surrogate, then the gestational surrogate was not the mother, and the matter did not fall within the purview of the adoption law. Further, the application of those laws would likely cause unintended, negative consequences, and that the adoption statute was not intended to settle parentage questions in these matters [12].

An interesting intersection of the laws of four states was created by a gestational surrogacy case which began in Indiana, when Danielle Bimber (PA), the surrogate, was matched by Surrogate Mothers Inc. with James Flynn (OH), the intended and genetic father, and his partner, Eileen Donich. The embryo was created with eggs from a donor, Jennifer Rice (TX). After entering into a written contract, Danielle became pregnant after the transfer of the embryos created with Jennifer's donated eggs and James' sperm and ultimately gave birth to triplets in Pennsylvania. She asked that the triplets be discharged from the hospital to her, ostensibly because she thought James and Eileen were inappropriate as parents. James sued for custody, but the Pennsylvania court granted custody to Danielle and her husband. James asked Jennifer to claim parental rights as the genetic mother, and Ohio recognized her standing as a genetic parent. In its final hearing on parental rights, the case was appealed to the Supreme Court of Ohio. The court found that the surrogate carrier did not have standing to seek custody of the triplets and James was ultimately awarded custody of the children. However, the court explicitly refrained from ruling on the validity of surrogacy agreements, instead stating that it would be a matter for the legislature [13]. James Flynn died in 2011.

A 2011 New Jersey case involved two men who were registered domestic partners and who entered an agreement with Angelia Robertson, the sister of one of the men, to be their gestational surrogate. As a result, she had twins, signed an adoption consent, and then revoked. Angelia filed suit for custody. At trial, the judge, in finding that the surrogacy agreement and adoption consent (not signed in accordance with applicable state adoption laws) were unenforceable, looked to policy considerations over genetic questions. He also entertained evidence regarding the "best interest of the child" standard. The final disposition was sole custody with the genetic father and his partner. However, the court also found that Angelia was, under New Jersey law, the mother and she was granted visitation. The nongenetic, intended father was not awarded parental rights and was left, in essence, to be considered the uncle of the children [14].

National Legal Status of Gestational Surrogacy

Fewer than two dozen states have statutes governing gestational surrogacy. As of this writing, one jurisdiction, Washington D.C., criminalizes surrogacy contracts by statute; this is the only jurisdiction with such a restrictive prohibition. The law does not specifically prohibit gestational surrogacy/carrier arrangements (it does not differentiate "traditional surrogacy" from gestational surrogacy), so it is unclear whether it applies to gestational carrier contracts. But given the harsh consequence of criminal punishment, it is highly unlikely that gestational surrogacy contracts are written under D.C. law. (The statute does not prohibit the arrangements, only the contracts. As a practical matter, in certain, narrowly defined circumstances, this may allow for D.C. citizens to participate under another state's law.) Five states' laws prohibit enforcement of gestational surrogacy contracts: Arizona, Indiana, Michigan, New York, and Nebraska. Seven states' laws regulate or restrict the practice: Florida, New Hampshire, Nevada, Texas, Utah, Virginia, and Washington. One state, Illinois, permits surrogacy and provides regulatory structure so that no court action is necessary.

Seven of the states have statutes that specifically permit the arrangements but fail to provide real guidance as to whom it should be practiced: Arkansas, Connecticut, Iowa, North Dakota, New Mexico, Tennessee, and West Virginia. In the remaining states, there are no statutes. Eight of those have a published case that, at least arguably, supports gestational surrogacy: California, Ohio, Massachusetts, Maryland, Maine, New Jersey, Pennsylvania, and South Carolina. There are 21 states with no statute and no published case law: Alaska, Alabama, Colorado, Delaware, Georgia, Hawaii, Idaho, Kansas, Kentucky, Minnesota, Missouri, Mississippi, Montana, North Carolina, Oklahoma, Oregon, Rhode Island, South Dakota, Vermont, Wisconsin, and Wyoming [3]. For an excellent and thorough state-by-state review of surrogacy law, the reader is directed to http://www.ambar.org/familyadvocate.

Implications for the Practitioner

At a minimum, medical practitioners should be aware that the parties involved in gestational carrier arrangements require legal counsel. Especially in view of the state-by-state inconsistencies, and the practice of recruiting carriers from other places, confusion about the applicable laws is not uncommon. Independent legal representation facilitates the creation of a written contract that outlines the parties' intentions and understanding of rights and responsibilities, memorializes how disputes will be resolved, and elects which state's laws will apply. Further, experienced counsel should know and access the appropriate protocols for obtaining a pre-birth order, or other determination of parentage, with the concomitant declaration that the gestational carrier (and her husband/partner) is not the parent of any child. Even if the carrier is a friend or relative of the intended parent(s), and perhaps especially in those circumstances, the contract is critical, and the legal referral should be made. In fact, best practice is to not permit the commencement of medical treatment until the contract has been finalized. Most attorneys will provide a legal clearance letter to the fertility center, indicating that the contract has been signed by all parties and that, from the legal perspective, they are ready to proceed with the medical procedures.

Medical providers should also be aware that even in states where gestational carriers are permitted, enforcement of contracts and obtaining pre-birth orders may not be possible in all situations. A same-sex couple, or a single person, may not enjoy the same protections as do heterosexual, married couples. Similarly, the use of donor gametes may, in some states, prevent the issuance of a pre-birth order. While viable solutions may be available for these potential parent(s), the scenarios are complicated and require legal advice from an expert in reproductive law. Medical providers should not make the mistake of providing legal advice to patients. A basic knowledge of the law is helpful to the physician providing care in collaborative reproduction cases, but advising patients of the law should be left to the legal experts.

In any ART care plan involving third parties, it is critical to recognize and define who the patient is. In this triad, every member is a patient of the practice, and each is owed the same duty of care. The practitioner should request that the intended parent(s) and the carrier and her husband/partner document authorization for release of medical information to the others in the arrangement and to define the scope of that authorization.

A core concept of an enforceable agreement is that decisions concerning the carrier's health and care are within the sole authority of the carrier and, closely aligned, is the principle that her well-being takes precedence over that of the fetus. The parties must understand and accept that specific performance of certain contract terms, such as an agreement to terminate or not terminate a pregnancy, is not amenable to enforcement by specific performance. While a contract might provide other remedies for this kind of breach, forcing the carrier's compliance is not a possibility.

Consistent with ASRM Guidelines, a mental health consultation for all parties, including those involved in a friend or family arrangement, is crucial and should never be waived [15].

Cross-border reproductive care has sharply increased in the past decade. In many countries, prohibiting payment to gestational carriers and donors severely restricts access to collaborative reproduction, driving fertility patients across national borders for treatment. Additionally, for American patients, the cost involved, often exceeding $75,000, and the burdensome process prompt them to search elsewhere for treatment and for a source of carriers. Often, the destination is India. The ongoing ethical debate concerning the engagement of women in such a culturally and economically different society continues. But it is well settled that laws of the home country and the foreign country conflict and issues of the child's citizenship, arising from questions of who is recognized as a parent, create significant challenges for these patients. The clinician should recognize the potential for perhaps insurmountable difficulties when patients attempt to return home and, following the relevant guidelines, refer the patient to qualified and experienced counsel [15].

Conclusion

There continue to be uncertainties and changes in the legal climate surrounding the use of gestational carriers. A review of the laws in the USA or, perhaps more to the point, the current lack of them, underscores the inconsistency in dealing with gestational carriers. Any number of state legislatures have entertained proposed bills to regulate use of gestational carriers, either by facilitating or restricting it, and it is likely that some form of these initiatives will become laws in the near future. In the meantime, disputes will be addressed by the courts, and resolutions will be case-specific, unpredictable, and often at variance with what were once thought to be established principles in reproductive law.

Medical practitioners should be familiar with and follow the guidelines and opinions issued by ASRM, as these are sure to be interpreted as the standards of care in this field of medicine [15]. Recognition of the legal complexities in gestational carrier arrangements is critical to best practice, and in any gestational carrier arrangement, the patients (gestational carriers and intended parents) must be referred to independent legal counsel. It bears noting that an informed consent is not a contract among the parties to surrogacy arrangements and is not a substitute for a negotiated agreement.

The goal of the medical provider is to assist the intended parents in producing a child. The goal of the legal practitioner is to obtain secure, nonmodifiable parental rights for those intended parents while ensuring that the rights and interests of the third-party collaborators are protected. The combined efforts of medicine and law establish a legally recognized, desirable end point: not just a child and would-be parents, but a true family.

References

1. *In re Baby M.,* 537 A.2d 1227 (NJ 1988).
2. Kindregan C, McBrien M. Assisted reproductive technology: a lawyer's guide to emerging law and science. Chicago: ABA Publishing; 2006.
3. Hinson D, McBrien M. Surrogacy across America. Family Advocate. 2011;34:2. Surrogacy contract enforcement is prohibited by statute in DC, KY, ND, TX, AZ, NE.
4. *R.R. v. M.H.*, 426 Mass. 501, 689 N.E. 2d 790 (1998).
5. *In re Marriage of Moschetta, 25 Cal*. App. 4th1218, 30 Cal. Rptr. 2d 893 (1994).
6. *Doe v*. Doe, 244 Conn. 403, 710 A.2d 1297 (1998).
7. Utian WH, Goldfarb JM, Kiwi R, Sheean LA, Auld H, Lisbona H. Preliminary experience with in-vitro fertilization-surrogate gestational pregnancy. Fertil Steril. 1985;52:633–8.
8. Fletcher J, Layton MJ. Parents' hope reborn with 'gestational carrier' [Internet] NJ: 2012 June 3; [cited 2012 December 10]. http://www.northjersey.com/news/156879885_Parents_hope_reborn_with_gestational_carier_html?.
9. *Johnson v. Calvert*, 5 Cal. 4th 84, 851 P.2d 776, 19 Cal. Rptr. 2d 494 (1993).
10. *Belsito v. Clark*, 67 Ohio Misc. 2d 54, 644 N.E. 2d 760 (1994).
11. *In Re Marriage of Buzzanca*, 61 Cal. App. 4th 1410, 72 Cal. Rptr. 2d 280 (1998).
12. *Culliton v. Beth Israel Deaconess Medical Center,* 435 Mass. 285, 756 N.E. 2d 1133 *(2001).*
13. *J.F. v. D.B., 879 N.E. 2d 740, 116 Ohio St. 3d 363 (Ohio 2007); J.F. v. D.B, .897 A.2d 1261 (Pa. 2006).*

14. *Robison v. Hollingsworth*, Docket # FD-09-001838-07; 2011 (N.J. Superior Court, Hudson County) NJ.
15. Practice Committee of the American Society for Reproductive Medicine. Recommendations for practices utilizing gestational carrier: an ARM practice committee guideline. Fertil Steril [Internet]. 2012 June 97;6 [cited 2012 Dec. 10]; 1301:[about 8 pp]. http://www.asrm.org;uploadedFiles/ASRM_Content/News_and_Publications/ Committee_Opinions/recommendations_for_practices_utilizing_gestational_carriers.pdf.

Use of Gestational Carriers: Psychological Aspects

7

Dorothy A. Greenfeld

For many whom it would not have been previously possible, use of a gestational carrier is another marvel of reproductive technology that offers a chance for parenthood. Women who were born without a uterus, who have other uterine anomalies preventing a healthy pregnancy, who have serious medical problems, and those with other contraindications for pregnancy can now become mothers with the help of a gestational carrier. Also, single men and gay male couples can now become parents of a biologically related child with the help of an oocyte donor and a gestational carrier. In the past decade, the use of gestational carriers has grown exponentially, providing hope and promise to a new cohort of potential parents. However, with the increasing numbers of would-be parents seeking these services, the increasing numbers of women offering to be gestational carriers, and the increasing number of children born as a result, it is growing clearer that the use of gestational carriers is not without psychological issues. In fact, "in surrogacy almost every issue has a psychological component" [1]. The purpose of this chapter is to address psychological aspects of the use of gestational carriers for intended parents, gestational carriers, and the children born as a result.

D.A. Greenfeld, M.S.W. (✉)
Department of Obstetrics, Gynecology and Reproductive Sciences, Yale University School of Medicine, 150 Sargent Drive, 2nd Floor, New Haven, CT 06511-6110, USA
e-mail: dorothy.greenfeld@yale.edu

Historical Perspective

Surrogacy has an ancient history. A notable example from the Old Testament is the story of Hagar, who gave birth to Ishmael for Sara and Abraham because Sarah could not conceive (Genesis 10, Authorized [King James] Version). Early cases of surrogacy were achieved through sexual intercourse between the intended father and the surrogate, but by the 1970s, programs in the USA began to offer what is now termed *traditional surrogacy* [1]. In this method, the surrogate is artificially inseminated with the semen of the intended father and, shortly after giving birth, relinquishes the baby to the intended parents. Traditional surrogacy is medically straightforward, but, because the surrogate is biologically related to the baby, the process can be fraught with legal and psychological complications. An example of this sort of complication is a case known as "Baby M," in which the surrogate, Mary Beth Whitehead, refused to relinquish the baby to the intended parents. The result was a highly public court case that resulted in primary custody of the child being awarded to the intended parents and visitation rights granted to Ms. W, a less than desirable outcome for either party [2].

J.M. Goldfarb (ed.), *Third-Party Reproduction: A Comprehensive Guide*,
DOI 10.1007/978-1-4614-7169-1_7,

The advent of in vitro fertilization (IVF) made it possible for embryos created from the gametes of the intended parents to be transferred to the uterus of a surrogate, who thus had no biological connection to the child. This was initially known as *gestational surrogacy*, but currently the term *gestational carrier* is preferred. The first successful case of using a gestational carrier was reported in the USA in 1985. The embryos of the intended parents were transferred through IVF to the uterus of a 28-year-old woman who was compensated $10,000 for her services [3]. By 2005 over 6,000 such births had been accomplished in the USA and the UK, and the numbers are growing [1]. Gestational carrier programs are also available in several other countries, including parts of Australia, Brazil, Canada, Finland, and India. However, laws vary in these countries about who can participate and whether gestational carriers can be financially compensated [4].

Gestational Carriers

Who are these young women, and why are they willing to carry a pregnancy for someone else? The characteristics of gestational carriers have been well described, and studies are generally in agreement that candidates are typically Caucasian, in their late 20s or early 30s, married, have more than one child, have 2 years of college, and are of the Christian/Protestant faith [1, 5, 6]. Their motivations for participation as a gestational carrier have been studied as well. Among many concerns expressed about using gestational carriers was the fear that destitute women would be seeking to be gestational carriers and that their primary motivation for participation would be money. In fact, gestational carriers are typically from the working class and put financial compensation low on the list of what motivates them to participate. Many are motivated by the desire to do something important with their lives. Others are motivated for altruistic reasons and welcome the idea of helping an infertile couple achieve parenthood. Though they may have completed their own families, many gestational carriers report that they enjoy being pregnant and welcome the opportunity to repeat the experience. In some cases, gestational carriers have been motivated by a wish to psychologically undo something in their past such as the previous termination of an unwanted pregnancy [7–10].

The psychological health and well-being of gestational carriers, their psychological state post procedure, and their relationships with the intended parents have also been well studied. Candidates for gestational carrier are generally psychologically screened pretreatment to determine that they are psychologically stable and without evidence of psychopathology [1, 7, 9, 10]. How gestational carriers feel following childbirth and relinquishment of the infant has also been examined, and studies show that gestational carriers generally do not regret their experience or have problems psychologically after relinquishing the infant [11–13]. Gestational carriers also typically reported a good relationship with the intended parents following the birth, and their level of satisfaction correlated with a respectful and comfortable relationship with the intended parents [13].

Intended Parents

Who are the women requiring the services of a gestational carrier in order to achieve parenthood, and how do they experience the process? Typically, they are women who were born without a uterus, whose uterus has been surgically removed, or who have a serious health problem that prevents them from carrying a pregnancy [12]. Many who heretofore thought that they had no possibility for motherhood feel that they "have been given a second chance" when they learn about the process. Post birth, most report the experience positively and have a good relationship with the gestational carrier. A follow-up study of couples who became pregnant through use of a gestational carrier looked at 42 families with 1-year-old children. Parents reported that they had a positive view of their surrogacy experience. They had good relationships with their gestational carriers and maintained some contact with them [13].

Increasingly, single men and gay male couples enter fertility programs seeking fatherhood through IVF with a gestational carrier and an oocyte donor. Research has not considered the experience of single men in that milieu, but two studies recently looked at experience for gay male couples. The medical and psychological experience of 30 gay males (15 couples) going through IVF with an egg donor and gestational carrier was described. All couples were in a committed relationship and had been together for an average of 7 years. They were in good health and psychologically stable. These couples gave a great deal of consideration to the plan for fatherhood and were very clear about which partner would provide the sperm [14]. Another recent study looked at the transition to parenthood for 40 gay males who became fathers through use of a gestational carrier. Subjects reported improved self-esteem and a greater closeness to their family of origin as a result of becoming parents [15].

Children Born Through Surrogacy

Several studies have looked at the developmental outcome of children born by a gestational carrier and concluded that children were within the normal range [16]. In 2006 Golombok et al., in a longitudinal study of children conceived with assisted reproductive technology, compared 67 families with naturally conceived children to 34 gestational carrier families, 41 donor oocyte families, and 41 insemination families, assessing the psychological well-being of parents, children, and the quality of the mother–child relationship. Researchers found higher levels of warmth and greater interaction between mother and child in assisted-reproduction families than in families with naturally conceived children. Parents of children born to gestational carriers were far more likely to disclose to offspring the nature of their conception than were parents of children born as a result of gamete donation [17]. So far, there are no studies of the psychological well-being of children born to gestational carriers whose fathers are single and/or gay.

Practical Considerations for Clinicians

Pretreatment preparation and guidance for all parties—the gestational carrier, her partner (if she has one), and the intended parents—are essential parts of the process to be established by clinicians in the fertility center. This process gives participants a clear sense of the medical, legal, and psychological demands of the use of a gestational carrier. Hanafin refers to this as taking a "proactive approach" and states that the most common problems that occur between gestational carriers and intended parents are struggles with medical issues, struggles with the relationship, and struggles with logistical surprises [1]. Because the intended mother may have a history of infertility, pregnancy loss, and/or failed cycles, she enters the process with a certain amount of trepidation but perhaps with a good understanding of the medical demands of the cycle. The gestational carrier, however, typically enters with a degree of confidence in her own body and her past history of conception and pregnancy. That confidence can sometimes lead to problems in the medical milieu because she may not appreciate the demands of assisted reproduction and the importance of following the treatment regimen.

Gestational carriers are sometimes relatives or friends of the intended parents who have volunteered to carry the pregnancy. In most cases, however, they have no prior relationship with the intended parents and have been recruited through an agency and matched to the intended parents. Often at the very time, they are beginning to establish a relationship with each other, and they are also entering into a treatment that may be sadly familiar to the intended mother and a foreign subject to the gestational carrier (of course the situation may be reversed when pregnancy is established). Common problems that may occur in the fertility setting may have to do with travel for the gestational carrier or medication issues (i.e., the gestational carrier has confidence in her ability to get pregnant and does not understand the importance of the medications for the cycle).

A legal contract between intended parents and their gestational carriers is crucial and should be obtained before medical treatment begins. Intended parents need to be well educated about surrogacy laws in the state where they reside and, more importantly, in the state where the gestational carrier resides. Not all states are open to use of gestational carriers. Some allow all uses of gestational carriers; others only allow use of gestational carriers if the gestational carrier is not compensated, and others ban it altogether or for nontraditional couples. It is important that the gestational carrier delivers the baby in a "surrogacy-friendly state" where the intended parents can go to court before that baby's birth to establish that their names will be on the birth certificate. Financial compensation should be discussed and agreed upon between parties before treatment begins [13].

Gestational carriers must have their own independent legal representation by an attorney who is licensed in the relevant state and familiar with third-party reproduction [13]. A legal contract is protective and educational for both parties. Important issues such as the possibility of a failed cycle (and how many cycles both parties are willing to go through), pregnancy loss, pregnancy complications, problems with the fetus that may result in a pregnancy termination, multiple pregnancy, and multifetal pregnancy reduction are addressed in the legal agreement. Because of the emotional impact of these issues, there is a great deal of overlap between topics covered in the legal consultation and the psychological consultation with a mental health professional.

Psychological Issues

Recommendations for Psychological Screening

In 2012 the ASRM Practice Committee published recommendations for fertility practices using gestational carriers to "address the complex medical and psychological issues that confront the gestational carrier and the intended parents, as well as the children" [13]. These recommendations were published with the purpose of making the screening guidelines for the medical and psychological assessment of gestational carrier candidates more consistent and up to date. While the committee makes recommendations for a psychological interview with both gestational carriers and intended parents and includes criteria for psychological rejection of both parties, it draws a distinction between the "psychosocial education" for the intended parents and the psychological evaluation of gestational carriers.

For the intended parents, the guidelines point out the "complexity" of the decisions that go into using a gestational carrier and strongly recommend psychosocial education and counseling by a qualified mental health professional. The clinical interview and psychological assessment include a discussion of the medical and psychological demands of using a gestational carrier, couples' history of infertility and methods of coping, the risks of unsuccessful cycles, pregnancy loss, multiple pregnancy, multifetal pregnancy reduction, and elective termination. Another important aspect of the interview includes counseling couples about the importance of establishing a respectful relationship with the gestational carrier as well as the importance of reaching an agreement with her on medical decisions regarding her body. Criteria for rejection include, besides abnormal psychological evaluation, unresolved or untreated addiction, unresolved or untreated psychiatric disorders, current marital or relationship instability, and intended parents' inability to maintain a respectful and caring relationship with the gestational carrier.

For the gestational carrier, a clinical assessment and psychological testing to determine her ability to cope with the psychological demands of being a gestational carrier are recommended. These include her ability to understand and cope with potential medical issues such as treatment failure, pregnancy loss, pregnancy complications, multiple pregnancy, multifetal pregnancy reduction, and elective termination. The assessment should also review her current life stressors; history of pregnancy and childbirth, whether she experienced postpartum depression or other reproductive problems; as well as her social, sexual, and psychiatric history. Reasons for rejection include an inability to give informed

consent, addiction, uncontrolled depression and other current psychiatric disorders, chaotic lifestyle, and evidence of emotional inability to relinquish the baby at birth.

The Role of the Mental Health Professional

Pretreatment psychological assessment and screening of participants entering a gestational carrier cycle are crucial parts of the process, but perhaps an even more valuable role for the mental health professional is one of educator and counselor. The counselor should be knowledgeable about the medical as well as the emotional demands of the process in order to prepare couples and their gestational surrogates for possible hurdles, such as a failed treatment cycle. Hanafin says that "foreseeing the range of problems that occur in third party reproduction and pregnancy and to apply these to the unique circumstances of the person's life" is a vital role for the mental health professional [12]. A joint session between the intended parents and the gestational carrier (and her partner if she has one) with the counselor is helpful. This is a meeting where much can be learned about expectations of all participants. A discussion of how to prepare for the birth, how to say goodbye, and what kind of future contact is desired by participants is included.

Conclusion

In recent years, it has become increasingly clear that use of a gestational carrier has offered the chance for parenthood to a whole new cohort of intended parents. Gestational carriers and intended parents alike report satisfaction with the process, and while longitudinal studies of children born by a gestational carrier are called for, preliminary research determined that children are doing well socially and psychologically. Pretreatment psychosocial education about the process as well as counseling and support for intended parents and gestational surrogates can assist in helping participants with this transition to use of a gestational carrier.

References

1. Hanafin H. Surrogacy and gestational carrier participants. In: Infertility counseling: a comprehensive handbook for clinicians. New York: Cambridge University Press; 2006
2. Steinbock B. Surrogate motherhood as prenatal adoption. Law Med Health Care. 1988;16:44–50.
3. Utian WH, Sheean L, Goldfarb JM, Kiwi R. Successful pregnancy after in vitro fertilization transfer from an infertile woman to a surrogate. N Engl J Med. 1985;313(21):1351–2.
4. Jones HW, Cooke I, Kempers R, Brisden P, Saunders D. International Federation of Fertility Societies surveillance 2010: preface. Fertil Steril. 2010;95(2):491.
5. Braverman AM, Corson SL. Characteristics of participants in a gestational surrogacy program. J Assist Reprod Genet. 1992;9:353–7.
6. Van Der Akker O. Genetic and gestational mothers' experience of surrogacy. J Reprod Infant Psychol. 2003;21:145–61.
7. Blyth E. "I wanted to be interesting. I wanted to be able to say 'I've done something interesting with my life'": interviews with surrogate mothers in Britain. J Reprod Infant Psychol. 1994;12:189–98.
8. Parker JP. Motivation of surrogate mothers: initial findings. Am J Psychiatry. 1983;140(1):117–8.
9. Resnick R. Surrogate mothers: relationship between early attachment and the relinquishment of the child [dissertation]. Santa Barbara, CA: Fielding Institute; 1989.
10. Jadva V, Murray C, Lycett E, MacCallum F, Golombok S. Surrogacy: the experiences of surrogate mothers. Hum Reprod. 2003;18(10):2196–204.
11. Reame N, Hanafin H, Kalsoglou A. Unintended consequences and informed consent: lessons from former surrogate mothers. Hum Reprod. 1999;14:361–2.
12. Practice Committee of the American Society for Reproductive Medicine; Practice Committee for the Society for Assisted Reproductive Technology. Recommendations for practices utilizing gestational carriers: an ASRM Practice Committee guideline. Fertil Steril. 2012;97(6):1301–8.
13. MacCullum F, Lycett E, Murray C, Jadva V, Golombok S. Surrogacy: the experience of the commissioning couples. Hum Reprod. 2003;18(6):1334–42.
14. Greenfeld DA, Seli E. Gay men choosing parenthood through assisted reproduction: medical and psychological considerations. Fertil Steril. 2011;95:225–9.
15. Bergman K, Rubio RJ, Green RJ, Padron E. Gay men who became fathers via surrogacy: the transition to parenthood. J GLBT Fam Stud. 2010;6:111–41.
16. Serafini P. Outcome and follow up of children born after IVF-surrogacy. Hum Reprod Update. 2001;7:23–7.
17. Golombok S, Murray C, Jadva V, Lycett E, MacCallum F, Rust J. Non-genetic and no-gestational parenthood: consequences for parent–child relationship and the psychological well-being of mothers, fathers and children at age 3. Hum Reprod. 2006;21:1918–24.

The Ethics of Hiring a Gestational Carrier

8

Kavita Shah Arora

Introduction

Much has been written about the ethics of infertility. Despite much progress in this area of medicine, infertility treatments remain "costly, time-consuming, invasive, and emotionally and physically arduous" [1]. As the rate of infertility has increased in the last 20 years owing to advancing maternal age and an increase in sexually transmitted infections, among other factors, the disparity between those that are most likely to be infertile and those that are most likely to be receiving infertility services becomes more apparent. Yet, those that cannot afford infertility services are "not just inconvenienced, they are denied the means to realize a basic and highly valued human good" [1].

As medicine has become increasingly reliant on technology and novel methods to address infertility have been developed, infertile women now have more options than ever before to bear children. Hiring a gestational carrier requires these technologies, including in vitro fertilization (IVF) and possibly egg donation, sperm donation, or a combination thereof. However in a recent survey of Western couples, IVF remains the most commonly desired option to treat infertility, and only 26 % of women surveyed would consider using a gestational carrier [2].

While IVF remains a more popular treatment for infertility, using a gestational carrier can allow a person or couple to have a child when otherwise not possible, because of either a congenital lack of a uterus, prior surgery/treatment to the woman's uterus, medical contraindication to pregnancy, or failed IVF. The only other currently available option in these scenarios is adoption, which may not be as desirable to some prospective parents, given the lack of genetic tie between child and parent(s) [3].

Using a gestational carrier needs to be differentiated from traditional or genetic surrogacy, in which the male in the hiring couple (or a sperm donor) provides sperm by which the surrogate is artificially inseminated. In this case, she is both the genetic and gestational mother of this child, while the female in the hiring couple will become the rearing mother. Traditional surrogacy is rarely done in the USA and is not the topic of this chapter, although some references to the outcomes of traditional surrogacy may be applicable to the more common practice of using a gestational carrier. The term gestational carrier refers to the procedure in which both the sperm and egg (or donor sperm and/or donor eggs) from the hiring couple are used to fertilize an embryo in vitro. This embryo is then transferred to the gestational carrier, who, therefore, does not share a genetic link to this resulting child [4]. The term gestational

K.S. Arora, M.D., M.B.E. (✉)
Department of Obstetrics and Gynecology, Northwestern University, 250 E Superior Ave, Suite 05-2177, Chicago, IL 60611, USA
e-mail: Kavita.Shah.Arora@gmail.com

J.M. Goldfarb (ed.), *Third-Party Reproduction: A Comprehensive Guide*,
DOI 10.1007/978-1-4614-7169-1_8,

carrier is now preferred over the term surrogate to clearly delineate the significant difference between traditional and gestational surrogacy.

While the legal and psychological aspects of using a gestational carrier will be discussed elsewhere in this edition, certainly, both impact the discussion of the ethics of hiring gestational carriers, because "with reproductive technology, the means is as much a matter of moral concern as the end" [1]. Using a gestational carrier has sparked much debate regarding ethical appropriateness and resultant consequences for the gestational carrier, hiring couple, child, and society at large. These concerns are regarding reproductive autonomy, commodifying women and their reproductive functions, baby-selling, coercion, exploitation of lower socioeconomic classes, lack of informed consent, and impact on the family. After each of these arguments against hiring a gestational carrier is analyzed, it is apparent that the practice of using a gestational carrier is ethically appropriate, provided there are safeguards for the autonomy of the gestational carrier. If the potential gestational carrier has previously had a healthy child, been properly screened psychologically and educated regarding being a gestational carrier as well as other options for income, is not being offered a sum of money that is coercive in her particular life circumstances, and is represented by a physician and lawyer independent from those of the contracting person/couple and gestational carrier agency, many of the concerns over using a gestational carrier can be allayed. With these precautions in place, using gestational carriers is both an ethical and needed treatment for infertility.

Reproductive Autonomy

Critics of using a gestational carrier have argued that the hiring person's/couple's and potential gestational carrier's reproductive autonomy can only extend so far. That is, while in general people are free to reproduce or not reproduce as they see fit, "privileging choice above all other considerations, and emphasizing achievement of ends over reflection on means" is troublesome and results in an impoverished understanding of reproduction [1]. This is especially true when reproduction is discussed in terms of negative and positive rights. Therefore, while all women may have the negative right to not have interference when and if they decide to become pregnant and carry a pregnancy, they do not have the positive right to claim that others (physicians and/or society) have the obligation to assist them in achieving this right [5]. This is because, while we all have reproductive autonomy and negative rights in our private lives, reproduction is never purely private. Reproduction by its very nature is relational and social, as it introduces a new relationship between parent and child and child and society. Therefore, critics of using a gestational carrier argue that these private reproductive rights must be viewed through a societal lens [1].

Yet, this same discussion of negative versus positive rights and the social nature of reproduction is surely not unique to hiring a gestational carrier. Not only do other readily accepted forms of artificial reproductive technologies create the same ethical dilemma, so does natural, unassisted conception. While a woman may not have the right to demand others to assist in her desire to have children, if these services are available and affordable to her, she certainly may utilize them as she desires.

Procreative liberty is not only a constitutionally protected right based on privacy but also an ethical imperative due to its "central importance to an individual's meaning, dignity, and identity" [6]. These rights are fundamentally important and can only be overridden by another compelling interest, such as significant harm to the child or surrogate. As discussed below, given that using a gestational carrier does not meet this threshold for other compelling interests in terms of harm to the child or surrogate, surrogacy remains a method by which to fulfill reproductive autonomy, not an overextension, as critics have argued.

This ethical imperative of reproductive autonomy forms the basis for the rejection of contracts or legislation that restricts a woman's control over her body, including using a gestational carrier [7]. Thus, banning the usage of gestational carriers altogether would buy protection for the

gestational carrier at a very high cost, as "it deprives women of a deeply personal decision" [8]. In fact, allowing for the hiring of gestational carriers allows for the reproductive autonomy of all parties to be fulfilled—the contracting woman/couple's as well as that of the gestational carrier to control her own body [3, 5, 9, 10].

Commodifying Women

Another common objection raised by critics of using a gestational carrier is that the practice commodifies women and their reproductive abilities. To summarize Kant, if something cannot be priced (i.e., the human body), then it has dignity; however, once a price is attached to something, then it can be exchanged for an equivalent and its dignity is lost. The individual, then, "would no longer have a value, only a price." Critics argue that because gestational carriers are paid, their bodies and reproductive abilities become commodities with an exchange value on the free market instead of being valued intrinsically, much like prostitutes [5].

Since the contracting couple values the resultant child more than the gestational carrier herself, it is possible for the gestational carrier and her body to be treated as property and her diet, exercise regimen, and behavior strictly regulated [5]. These critics cite law stating that with the exception of blood, blood products, and gametes, organs and the human body are not permitted to be sold in the USA, based on the respect for the intrinsic value and dignity of the human body [5]. Therefore, the sale, even temporarily for gestation, of the uterus should be prohibited. The proffered solution, then, is to permit altruistic use of gestational carriers without compensation but ban any payment to gestational carriers in order to ensure that women are not being commodified into mere incubators [11].

Yet, what these critics do not comment on is that by legislating against a gestational carrier's autonomous decision to use her own body in a manner she sees fit, that effectively "*all* women [are turned] into reproductive vessels," as the government can now provide oversight into women's decisions and, in doing so, encroach on the autonomous and private decisions of all women [7]. The prostitution argument used by critics also misses its mark, given that the objective of prostitution versus hiring a gestational carrier is markedly different. Prostitutes sell their bodies for the sexual satisfaction of others, while gestational carriers aim to bring a child into the world [8].

While proponents of usage of gestational carriers agree that organs should not generally be sold, because it is inconsistent with human dignity, it is important to remember that the uterus is not being sold, simply rented. This is different from selling a kidney for transplantation on the black market in that the seller retains possession and the use is temporary. If sperm, hair, and blood may be sold, what is so special about the uterus [5, 7]? Just as men are able to sell their reproductive services (sperm donation), so should women be able to sell theirs through egg donation and/or be a paid gestational carrier [5, 12]. Finally, it is important to note that hiring a gestational carrier does not actually pay a woman for her body but compensates her for the services of her body. This is similar to manual laborers, singers, and actors, who are paid for what their bodies can do and does not result in the commodification of their bodies. The contracting couple does not have the right to do what they please with the gestational carrier's body, any more than you or I have the right with those of the construction workers building our houses or actors on our televisions. We are justly paying them for the services of their bodies, not commodifying their bodies [8].

Commodifying Children

Critics have also worried that if we now permit the sale of gametes, and using gestational carriers allows for the sale of uteri, then isn't this akin to selling babies? Since gestational carriers are being paid not simply for the sake of being pregnant but for the ultimate "product" of a baby, then a price is being attached to the child and he/she is being bought and sold on the free market

[5]. Critics also counter the above argument that a gestational carrier does not sell her body or the child but rather her services, by stating that it is "*precisely* the surrender of the baby and termination of the gestational carrier mother's parental rights" that is intended [14]. By paying the gestational carrier a substantial sum of money, the contracting person/couple is attaching a price and a worth to the child. By extension, is the child conceived through IVF worth more than the child who was spontaneously conceived? A final argument offered by opponents of using a gestational carrier is that baby-selling treats infants as means to the end of their infertile parents' happiness rather than ends unto themselves [5].

While the baby-selling argument is certainly attention-grabbing and stimulates a guttural reaction to using a gestational carrier, a closer look demonstrates that hiring a gestational carrier is not any more akin to baby-selling than IVF is. Just as it is not baby-selling to pay the physician who performs IVF, without which a couple is not able to become pregnant, it is not baby-selling to pay the gestational carrier who provides necessary services. The money exchanged is so that a person/couple can raise a child, not an object that they intend to treat like a commodity [7, 8]. From conception, the child is intended for the hiring person/couple; thus, he/she is never being sold or given up by the gestational carrier but rather intended for the hiring person/couple [15]. A child born by a gestational carrier certainly has the same worth as a child born through unassisted reproduction, that of a human being with dignity and, therefore, without a price. While the person/couple employing a gestational carrier may value having a child more than an infertile couple who chooses not to use a gestational carrier or other assisted reproductive technologies, the child's worth as a human being is constant and equal.

While it is true that the contracting person/couple is paying for both the gestational carrier's services as well as her termination of her parental rights, this still does not amount to baby-selling. We allow men to donate sperm and women to donate ova, both of which involve the contracted preconception termination of their biological parental rights. Similarly, when using a gestational carrier, the rights of the gestational carrier as the gestational mother are contracted to terminate with the birth of the child [7].

It is important to state, however, that precautions must be in place to ensure that payment is not "contingent on the delivery of an 'acceptable product'—a live-born, healthy child." Rather, since the services and termination of parental rights of the gestational carrier are being reimbursed, the payment should not change if an intrauterine fetal demise or disabled child results [3].

Coercion

Perhaps one of the most fair criticisms of using a gestational carrier is the potential for coercion. Just as in the case for egg donation and research ethics, it is difficult to state a fair price for the surrogate's time and efforts without "providing an inappropriate incentive" [1]. If the price were high enough, the transaction would cease to be voluntary, as there would no longer be a "genuine option of choosing between alternatives" and both contracting parties would be dehumanized by "degrading a profound human relation" [5]. It is also very important that nonfinancial coercion be minimized when an infertile person/couple is using a family member or friend as the gestational carrier.

While it is certainly true that the potential for coercion exists in hiring a gestational carrier, just as it does in egg donation or even for healthy volunteers for a research study, it is important to remember that finances are not the only motivating factor for potential gestational carriers. In a Michigan study in which over 275 surrogate applicants were reviewed, while the fee was an important consideration, surrogates (both traditional and gestational) also enjoyed being pregnant, gained satisfaction from their altruistic gift to another person/couple, and used surrogacy as a method to master guilt regarding past pregnancies [3, 16]. In this study, 89 % of potential surrogates (both traditional and gestational) stated that a fee was a necessary, but never a completely sufficient, reason for being a surrogate [5, 6]. Therefore, it seems paternalistic to state that the

gestational carrier is being exploited when she has other motivations for volunteering to carry another person's/couple's child and is the best judge of her own interests [8, 10, 13].

Secondly, gestational carriers do not volunteer because they need the income for basics of life such as food and shelter, as most are married with family incomes from $25,000 to $50,000 [7, 8]. Thus, they are not truly coerced, because "they are not deprived of anything that they are otherwise entitled to if they refuse." It also seems unfair to not pay gestational carriers while the physicians, agency, lawyers, and gamete donors (if applicable) are paid for their respective roles in the gestational carrier arrangement [6]. It also is sexist and unjust that if a man sought out a second job to provide for his family—even one that required the services of his body, such as manual labor—this would be lauded by our society. Yet, if a woman looks for a source of supplemental income via being a gestational carrier, she is somehow being exploited [7]. Thus, even the acknowledgement that compensation is an important factor in the agreement for the potential gestational carrier is not a sign that surrogacy is unethical. After all, most people would not do their jobs if they were not being paid [8].

Some critics argue that using a gestational carrier should be banned because of the particularly egregious nature of the work. That is, being a gestational carrier is an "around-the-clock" job that requires certain restrictions on lifestyle, such as avoiding alcohol and unpasteurized cheeses. Yet, being a gestational carrier is certainly not the only occupation that is "around the clock," and gestational carriers should have had other pregnancies and are well aware of a pregnancy's impact on their lifestyle [8]. Practically speaking, it is also difficult to draw a line differentiating what sum of money is a proper reimbursement for services provided and what sum of money is an undue inducement that has the potential to be coercive [10]. However, similar to how it is decided for egg donation or volunteering for a research study, it is the responsibility of the parties involved in each gestational carrier arrangement to ensure that the amount of money being offered would not be coercive or an undue inducement based on the life circumstances of the potential gestational carrier being considered. It is also important for the potential gestational carrier to have a distinct physician and lawyer from the contracting person/couple so that her best interests are safeguarded without any potential for a conflict of interest.

Exploitation

Critics of using a gestational carrier also argue that use of a gestational carrier exploits women of lower socioeconomic statuses unfairly. While this objection is by no means unique to hiring a gestational carrier as an assisted reproductive technology (egg donation is often criticized for this as well), it is valid that generally the contracting person/couple, gestational carrier agency, and lawyers usually have more resources and information than the potential gestational carrier, and, thus, there is a potential vulnerability that could be exploited [3, 5, 8].

However, in our society, there are many other present arrangements where members of a lower socioeconomic status work to provide services for members of a higher socioeconomic status [10]. Housekeeping, custodial work, and manual labor are generally not portrayed to be exploitive, so it should also be acceptable in the case of using a gestational carrier. In fact, many of these occupations are more risky to a person's health than a healthy pregnancy [6]. Seen through the lens of health care, it is also important to note that we do not deny health care to those who can afford additional services simply because others cannot [5]. Banning the use of gestational carriers based on this potential for exploitation not only is contradictory to our commercial society, where "we presume that individuals are free to spend their money however they wish," but also would likely decrease access to this necessary service [1].

In acknowledgement of this power imbalance as well as the potential to exploit women of lower socioeconomic statuses, it is important that gestational carrier arrangements require education regarding being a gestational carrier, risks of pregnancy, and other available opportunities for

employment so that potential gestational carriers can make a free, voluntary, and informed decision [8]. Society, as a whole, must also work to increase access to infertility services for all women and couples, because it is deplorable that those who need infertility services the most are the least able to afford them. If infertility services were covered by insurance, then reimbursement for gestational carriers would become more uniform and less likely to be coercive. As women of lower socioeconomic classes become able to afford infertility services such as hiring a gestational carrier, the appearance of exploitation of lower socioeconomic classes by those in higher socioeconomic classes would also be mitigated.

Informed Consent

Another criticism of hiring a gestational carrier is that women are unable to provide true, informed consent at the time the contract is signed, prior to pregnancy and childbirth. As critics argue, the hormonal and emotional changes of pregnancy could result in maternal-child bonding that the gestational carrier was not anticipating and would render the inevitable separation with the infant heartbreaking. However, this problem can be greatly minimized if potential gestational carriers are required to previously have given birth to a healthy child. This is important both for her psychological well-being, as well as to ensure that she is fully informed as much as possible about what pregnancy and childbirth entails. In addition, this criticism of hiring a gestational surrogacy is at odds with the ethical doctrine of informed consent, which does not require a person to "have the experience first before one can make an informed judgment about whether to agree to the experience" [7]. This onerous addition in ethical theory would make consenting to most surgeries and medical procedures impossible [10].

This line of reasoning is also paternalistic and demeaning to women, as it assumes that women are incapable of freely and knowledgeably choosing to participate as a gestational carrier. "Respect for individual freedom requires us to permit people to make choices they may later regret [13]." Interestingly, around 1 % of past surrogates (both traditional and gestational) have changed their minds postnatally, while approximately 75 % of mothers who give a child up for adoption later change their minds [7]. This seems to suggest that potential gestational carriers are well informed and are choosing to assist other people/couples rather than making uninformed decisions that they later regret. It also seems inconsistent to allow the postnatal waiver of maternal rights, in the case of adoption, but not the prenatal waiver of these rights as is done when hiring a gestational carrier [13]. Critics of using a gestational carrier would have the government, rather than the individual woman, decide which risks she may face and with which emotional struggles she may choose to deal [7].

Impact on Family

The final argument offered by critics of using a gestational carrier is that it is disruptive to the child born of the arrangement, other children in the gestational carrier's family, as well as our notion of "the family." While much of this will be discussed in the chapter on the psychology of hiring a gestational carrier, it is important to note that "harms to children who have no choice in a matter are more serious, from an ethical standpoint, than harms to adults who make a choice that they later regret. Further, a distinction should be made between harms that inevitably, or almost invariably, are associated with a practice and harms that likely could be avoided through advance planning, appropriate counseling, or oversight mechanisms" [3].

Critics have worried that children born by gestational carrier arrangements may have lower self-esteem due to feelings of rejection and rootlessness [16]. However, studies of children and families of surrogacy (both traditional and gestational) versus unassisted reproduction suggest that children of surrogacy function well in early school years [17]. Given that the adoption literature urges parents to disclose their child's birth circumstances, it is also interesting to note that 75 % of couples using a gestational carrier disclosed that fact to their child, while only 27 % and 40 % of donor sperm or donor egg couples,

respectively, disclosed [18]. Birth weights for twins and triplets born via gestational carriers were also significantly heavier than those born of IVF, and the incidence of low-birth-weight infants born from IVF and using a gestational carrier was also lower than of infants from IVF alone; this suggests that, given the medical comorbidities of women requiring IVF and/or the use of a gestational carrier, gestational carriers may actually provide a healthier intrauterine environment [19]. Finally, it is important to remember that, unlike the child involved in an adoption agreement, the child of a gestational carrier agreement cannot be harmed through the use of a gestational carrier, as he/she would not otherwise have been born at all [16].

Critics of the use of a gestational carrier also worry about the impact of hiring a gestational carrier on the older children of the gestational carrier as well as the gestational carrier's harmful impact on our notion of parenting and family. The lack of data demonstrating the harm on the existing children of the gestational carrier makes it difficult to pass ethical judgment. Also, parents can mediate and temper how their children perceive and react to experiences [7]. While collaborative reproduction, such as the use of a gestational carrier and other artificial reproductive technologies, does employ the use of a third party in the traditional two-party parenthood, offspring of other artificial reproductive technologies do not seem confused about who their "true" parents are. The use of a gestational carrier does, however, have the potential to introduce a child to the maximum possible number of people involved in his/her birth—a genetic mother, genetic father, gestational mother, and two rearing parents. There is a risk that the gamete donors are depersonalized and viewed only for their genetic contribution, but that is precisely the intention of these donors. The term "parent" is certainly redefined, and parental duties and responsibilities divided between a maximum of these five individuals, yet it is unclear how the child suffers from this division of responsibilities, which is freely chosen by each party, especially as the child will likely not have much interaction with any of her/his parents except the rearing parents [1, 6].

Conclusion

Whether the use of a gestational carrier is an ethical practice is certainly a contentious issue. Critics of hiring a gestational carrier argue that concern regarding reproductive autonomy, commodifying women and their reproductive functions, baby-selling, coercion, exploitation of lower socioeconomic classes, lack of informed consent, and impact on the family all contribute to surrogacy being an unethical practice that should be banned. However, after a closer look at each of these arguments, it is apparent that the practice of using a gestational carrier, as a whole, is an ethically justifiable and, in fact, needed technology for infertile women/couples. Safeguards to protect the potential gestational carrier from coercion, account for her vulnerability in terms of resources and lower socioeconomic status, and acknowledge the emotional difficulty in giving a child up after birth must be in place for the ethical practice of hiring a gestational carrier. The gestational carrier must previously have borne a healthy child; been properly screened psychologically; received education regarding the risks of pregnancy, her rights within the surrogacy agreement, and options other than surrogacy for employment; receive fiscal compensation that is not coercive based on her individual life circumstances; and be represented by a physician and lawyer independent of the contracting person/couple and surrogacy agency. With these safeguards, concerns over the ethical appropriateness of using a gestational carrier can be allayed, and its much needed practice can continue as a treatment for infertility.

References

1. Ryan M. Ethics and economics of assisted reproduction: the cost of longing. Washington, DC: Georgetown University Press; 2001.
2. Daniluk JC, Koert E. Childless Canadian men's and women's childbearing intentions, attitudes towards and willingness to use assisted human reproduction. Hum Reprod. 2012;27(8):2405–12.
3. ACOG Committee Opinion No. 397, "Surrogate Motherhood," American College of Obstetricians and Gynecologists. Obstet Gynecol 2008;111:465–70.

4. American Society for Reproductive Medicine. Third party reproduction: a guide for patients. Birmingham, AL: American Society for Reproductive Medicine; 2006.
5. Shannon TA. Surrogate motherhood: the ethics of using human beings. New York, NY: Crossroad Publishing Company; 1989.
6. Robertson JA. Children of choice: freedom and the new reproductive technologies. Princeton, NJ: Princeton University Press; 1994.
7. Andrews LB. Surrogate motherhood: the challenge for feminists. In: Alpern KD, editor. The ethics of reproductive technology. New York: Oxford University Press; 1992. p. 205–19.
8. Damelio J, Sorensen K. Enhancing autonomy in paid surrogacy. Bioethics. 2008;22(5):267–77.
9. Gostin L. A civil liberties analysis of surrogacy arrangements. In: Gostin L, editor. Surrogate motherhood: Politics and privacy. Bloomington, IN: Indiana University Press; 1990. p. 3–23.
10. Macklin R. Is there anything wrong with surrogate motherhood? An ethical analysis. In: Gostin L, editor. Surrogate motherhood: politics and privacy. Bloomington, IN: Indiana University Press; 1990. p. 136–50.
11. Radin MJ. Market-inalienability. In: Alpern KD, editor. The ethics of reproductive technology. New York: Oxford University Press; 1992. p. 174–94.
12. Mahoney J. An essay on surrogacy and feminist thought. In: Gostin L, editor. Surrogate motherhood: politics and privacy. Bloomington, IN: Indiana University Press; 1990. p. 183–97.
13. Steinbock B. Surrogate motherhood as prenatal adoption. In: Gostin L, editor. Surrogate motherhood: politics and privacy. Bloomington, IN: Indiana University Press; 1990. p. 124–35.
14. Moody-Adams MM. On surrogacy: morality, markets, and motherhood. Public Aff Q. 1991;5(2): 175–90.
15. Griswold A. Surrogacy was the way: twenty intended mothers tell their stories. Gurnee, IL: Nightengale Press; 2005.
16. Robertson JA. Surrogate motherhood: not so novel after all. In: Alpern KD, editor. The ethics of reproductive technology. New York: Oxford University Press; 1992. p. 45–56.
17. Golombok S, Readings J, Blake L, Casey P, Marks A, Jadva V. Families created though surrogacy: mother–child relationships and children's psychological adjustment at age 7. Dev Psychol. 2011;47(6): 1579–88.
18. Readings J, Blake L, Casey P, Jadva V, Golombok S. Secrecy, disclosure, and everything in-between: decisions of parents of children conceived by donor insemination, egg donation and surrogacy. Reprod Biomed Online. 2011 March 11. [Epub ahead of print].
19. Serafini P. Outcome and follow-up of children born after IVF-surrogacy. Hum Reprod Update. 2001;7(1): 23–7.

Part III

Embryo Donation

Embryo Donation: Medical Aspects

9

Bonnie G. Patel and Brooke V. Rossi

Introduction

Modern-day-assisted reproductive technology (ART) has enabled the infertile couple to conceive through numerous avenues of third-party reproduction. Although the concept of embryo donation is relatively recent, it offers a reasonable therapeutic option for such couples. Cryopreservation of excess embryos for future use is a widely practiced component of assisted reproductive techniques, and it is estimated that over 400,000 frozen embryos remain in storage in the USA [1]. Cryopreservation enables in vitro fertilization (IVF) centers to replace an appropriate number of embryos at a time, knowing that additional frozen embryos are available in case of failures or the desire for additional children. Once childbearing is complete, these couples face a dilemma with regard to disposition of these surplus embryos. Some couples do not find the idea of simply discarding these embryos acceptable and may desire additional options. Donation of these embryos for scientific research, including stem cell research, and donation to another infertile couple are other options. These patients are oftentimes sympathetic to other infertile couples, having been through similar reproductive challenges, and they may find comfort in enabling another couple to have a child. The concept of embryo donation also gained political ground when the Bush administration advocated for "Snowflake," a private embryo donation agency, and pledged one million dollars for their support [2].

The concept of embryo donation has started to gain nationwide regard. From 2004 to 2006, approximately 170 fertility clinics in the USA had performed at least one transfer of a donated embryo [3]. Keenan et al. reported that 2,224 donated embryo transfers were performed in this time period, resulting in 921 (41.4 %) pregnancies and 753 (33.9 %) live-born infants. The live birth rate per embryo transferred was reportedly 16.6 % across those sites.

History

The concept of embryo donation dates back to 1983, when a fresh donor embryo was specifically created for a biologically unrelated recipient, while the remainder of the embryos were

B.G. Patel, M.D. (✉)
Division of Reproductive Endocrinology and Infertility, Department of Obstetrics and Gynecology, University Hospitals Case Medical Center, 11100 Euclid Avenue, MAC 7007, Cleveland, OH 44106-5034, USA
e-mail: Bansari.Patel@UHhospitals.org

B.V. Rossi, M.D.
Department of Obstetrics and Gynecology, University Hospitals Case Medical Center, Case Western Reserve School of Medicine, 1000 Auburn Dr., Suite 310, Beachwood, OH 44122, USA
e-mail: Brooke.Rossi@UHhospitals.org

J.M. Goldfarb (ed.), *Third-Party Reproduction: A Comprehensive Guide*,
DOI 10.1007/978-1-4614-7169-1_9,

created for the donor couple's own use. Once the menstrual cycles of both women were synchronized, they both underwent embryo transfer on the same day [4]. The term "embryo adoption" has been used as early as the mid-1980s [5]. At this time, numerous instances of embryo donation began to be documented [6].

Embryo Donation Versus Embryo Adoption

Comparable to an adopted child, the child born after embryo donation has no genetic connection with his/her rearing parents. One must be careful, however, in distinguishing the concept of "embryo donation" from "embryo adoption." Adoption implies a legal process through which a child born to other parents is taken as one's own child [7]. While embryos certainly represent potential lives, regarding them as true persons is considered a fallacy [8]. Currently, only the statutes of Louisiana regard an embryo as a person [9]. A new statute in Georgia offers parents *the option* to confirm parentage through a court proceeding following embryo adoption, though this is not mandatory [10]. Hence, most states do not regard embryos as true persons [11]. Social and parental screening standards prior to embryo donation are similar to those of gamete/tissue donation and not to those in practice in adoption agencies. As such, the term "embryo adoption" is rendered obsolete and should not be used.

Indications for Embryo Donation

Ideal candidates for embryo donation include couples who are unable to conceive a genetically related child and therefore face the possibility of having to use both donor oocytes and donor sperm to conceive. Women who have poor-quality embryos or decreased ovarian reserve are candidates for embryo donation. Such women may suffer from premature ovarian failure secondary to autoimmune causes or chemoradiation for cancer treatment [12]. Despite the availability of emerging fertility preservation techniques, including ovarian transposition prior to pelvic irradiation, and oocyte and embryo cryopreservation, many women who undergo cancer treatment will have premature ovarian failure and will require ART. These women often choose oocyte donation as a means to build a family. However, there are significant costs associated with oocyte donation, including donation agency fees, donor compensation, ovarian stimulation medications, and oocyte retrieval of the donors. Use of donated embryos can provide a more cost-effective alternative to such couples.

Couples with significant male factor infertility also may benefit from embryo donation. Chemotherapy with alkylating agents specifically may predispose males to gonadal failure [13]. Males with certain genetic conditions, such as cystic fibrosis, may also suffer from significantly abnormal sperm counts, or even azoospermia [14]. Such couples may first consider therapeutic donor insemination, but they may opt for embryo donation if costs of other infertility treatments with donor sperm become unacceptable [15].

Couples with repeated IVF or implantation failures may also consider the option of embryo donation. Finally, patients with genetic conditions or chromosomal abnormalities may also desire embryo donation to reduce transmission to offspring. Although preimplantation genetic diagnosis for couples undergoing IVF is a viable option, there are significant costs associated with this technology; therefore, it may not be affordable to some couples [15].

Other patients who may benefit from embryo donation include same-sex couples or single women who desire children. Additionally, as adopting a child becomes more expensive and difficult, embryo donation may afford intended parents a more cost-effective means of having a family.

Advantages and Disadvantages of Embryo Donation

Embryo donation eliminates the risks of the IVF oocyte retrieval and ovarian hyperstimulation. The costs associated with transfer of cryopreserved embryos are significantly less than

undergoing a fresh IVF cycle and are similar to those of a frozen embryo transfer (FET) [15].

With proper selection of embryo donors, implantation and clinical pregnancy rates of donor embryo cycles are comparable to those of autologous ART procedures. An analysis of ART outcomes in six countries, including the USA, between 2001 and 2008, revealed a live birth rate of 14–33 % in embryo donation cycles compared to 16–28 % for autologous FET, 22–35 % for autologous IVF, and 15–52 % for oocyte donation [16]. Similarly, live birth rates per embryo transferred were comparable in embryo donation cycles (11–12 %) and autologous FET (8–11 %) and IVF cycles (12–15 %).

Similar to adoption, the child resulting from an embryo donation cycle has no genetic linkage to his or her parents. An advantage over adoption, however, is the ability of the mother to gestate the pregnancy and experience childbirth, thus facilitating parent–child bonding [17]. This would also give some assurance with regard to the level of care provided to the fetus during pregnancy, which may be of concern when adopting a child. The father would also be committed to the child from a younger age. Some studies have found that children created by ART have more interaction with their parents than those conceived naturally or who have been adopted [17].

Selection of Potential Embryo Donors

Decisions about disposition of surplus embryos can be difficult for any couple to make. Donors should be thoroughly counseled on implications of embryo donation, and their motivations for embryo donation should be noted. Unlike gamete donation, guidelines for embryo donation dictate that there should be no compensation for donors. However, the recipients should pay for all expenses incurred by the donors during the process [18].

Success rates for embryo donation depend on careful selection of both donors and embryos. While there are no specifics on paternal age, some authorities advocate that female donors should be between the ages of 18 and 36 [19].

Guidelines for Donors

The American Society for Reproductive Medicine (ASRM) has established guidelines for both donor and recipient screening [18]. It specifies that there should be a discussion of embryo disposition options prior to embryo cryopreservation. These options should be readdressed after couples have concluded building their families. The medical practitioner involved in the donation should be knowledgeable in the storage, thawing, and transfer of frozen embryos. The practitioner may charge a professional fee to the recipient couple for embryo thawing, transfer procedure, cycle coordination, and infectious disease screening for both donors and recipients. The guidelines specifically state, however, that the "selling" of embryos is unacceptable. FDA screening and testing requirements for tissue donation should be met by both parties involved.

The following are specific requirements outlined by ASRM for embryo donors:

1. Physicians must obtain a thorough medical and genetic history of both donor partners.
2. Donors should be screened for transmissible infections as per FDA regulations. Specifically, the following screening tests must be obtained on both partners (rescreening may be performed if more than 180 days have lapsed since cryopreservation of embryos).
   - 2.1. HIV-1 and HIV-2 antibody.
   - 2.2. A hepatitis panel, including hepatitis B surface antigen, hepatitis B core antibody (IgG and IgM), hepatitis C antibody, and nucleic amplification test.
   - 2.3. Serologic test for syphilis (VDRL or RPR).
   - 2.4. Cultures or nucleic acid-based tests for *Neisseria gonorrhoeae* and *Chlamydia trachomatis.*
   - 2.5. Male donors should be tested for HTLV-1, HTLV-2, and CMV antibodies.
3. Both donor partners should undergo genetic screening as deemed appropriate by history and physical exam.
4. Embryos may be used even if donor couples are not available for screening at the time of donation, provided that there is adequate

documentation specifying so. The ASRM, however, deems it safer to withhold embryo transfer in these situations.

5. Both donors must sign informed consent forms relinquishing all rights to donated embryos or persons resulting from them. Furthermore, these documents should also address situations of embryo damage or loss, rights to refuse transfer to an inappropriate recipient, and alternatives for embryo disposition after specified time limits of embryo cryopreservation have been met. These documents should also outline all legal proceedings for the process.
6. In recognition of the psychosocial stressors that these couples may face, donors may be offered a psychological consultation with a qualified mental health professional prior to donation. During these visits, the appropriateness of the donors' motivations, and family and psychosocial history, including objective personality tests, may be ascertained. Furthermore, unsuitable donors with a history of abuse, mental illness, impaired cognitive functioning, drug addiction, etc., may be precluded from embryo donation as deemed appropriate after these visits.
7. A minimum 3-month waiting period is recommended (though not required) between the time the donors sign consent forms and the actual transfer of embryos in the recipient.

Guidelines for Recipients

The following are specific requirements outlined by ASRM for embryo recipients:

1. The recipient couple must take full responsibility for the embryos and all children resulting from transfer of these embryos. Specifically, donors must be released from all liability with regard to potential complications from procedures or pregnancies, congenital abnormalities, heritable diseases, etc. The ART program should also be free of liability from any of these potential issues.
2. Recipients must be willing to undergo all the screening tests that the donors have undergone.
3. Recipients must be willing to adhere to established guidelines for embryo donation established by the ART program performing the procedures.
4. These patients should be offered a psychological consultation with a qualified mental health professional. Appropriateness of recipients may be gleaned, as those with significant psychiatric comorbidities, those engaging in current drug abuse, and those with inappropriate resources to cope with the stress of ART may be identified during these visits. Issues that arise from raising nongenetically related offspring and those of appropriate disclosure to these children may be addressed during these visits.

For use of embryos derived from gamete donors, all FDA screening and testing requirements for tissue donation must have been met by the donors. If donor sperm have been used to create the donor embryo, the sperm sample must have met the required 6-month quarantine period prior to fertilization. If donor oocytes are used, the female donor must have met all FDA requirements for tissue donation within 30 days preceding the oocyte retrieval [18].

Specific guidelines are available at www.asrm.org.

Transfer of Donor Embryos

The process of donated embryo transfer is analogous to that of frozen embryos. The decision of the number of embryos to be transferred hinges on the balance of optimizing success rates and minimizing multiple pregnancies [20]. Most clinics allow transfer of a maximum of two to three embryos [15], in compliance with ASRM age-related guidelines. Depending on the regularity of the female recipient's menstrual cycle, one may decide to undergo FET during a natural cycle, a substituted cycle, or a stimulated cycle.

Natural Cycle FET

Patients with regular ovulatory cycles have the option of undergoing natural cycle FET. These cycles are carefully monitored by ultrasound or

ovulation predictor kits to determine the precise timing of ovulation and subsequent embryo transfer. Alternately, ovulation can be induced by administration of a human chorionic gonadotropin (hCG) injection once the dominant follicle exceeds 18–22 mm. Once the timing of ovulation has been established, and the endometrium is deemed to be receptive (>8 mm), embryos can be transferred on day 3 or day 5, depending on the stage at time of cryopreservation [21]. Some labs may opt to freeze embryos at the blastocyst stage if abundant good-quality embryos are available from a particular cycle. There is some evidence that blastocyst transfer may increase live birth rates [22]. A potential disadvantage to this, however, is that cumulative pregnancy rates are diminished with blastocyst transfers compared to cleavage-stage transfers. A likely explanation for this is the lower rates of IVF cancellation and higher numbers of frozen embryos available with cleavage-stage transfers. Hence, if fewer transferrable embryos are available, cleavage-stage cryopreservation may be undertaken to maximize cumulative pregnancy rates. Progesterone supplementation, though not required, is usually provided for luteal phase support.

There are numerous advantages to undergoing natural cycle FET, including lower costs. Bahja et al. found significantly higher pregnancy and live birth rates in spontaneous cycle embryo transfers compared to substituted and stimulated cycles (20.49% vs. 13.04 % and 11.32 %, respectively; $P=0.0348$) [23], but other studies have failed to find a benefit of one protocol over another [24].

Substituted FET Cycle

The protocols for substituted FET cycles have evolved over the years. These cycles consist of the delivery of exogenous estrogen and progesterone to stimulate the endometrium for optimal embryo receptivity. Usually 4–6 mg of daily oral or vaginal estradiol is provided until optimal endometrial thickness is achieved (>8 mm). For synchronization between the endometrium and embryonic age, vaginal or intramuscular progesterone is provided for 3–7 days prior to transfer, depending on the stage of the cryopreserved embryo and the route of progesterone administration [25, 26]. Luteal phase progesterone should be administered, because it improves pregnancy outcomes [27].

Stimulated FET Cycle

Stimulated FET cycles consist of the administration of human menopausal gonadotropins (hMG) or follicle-stimulating hormone (FSH) in low doses (50 IU/day or 75 IU/day) from cycle day 2 or 3. Sizes of follicles are monitored with ultrasound, and ovulation is induced with exogenous hCG administration when the dominant follicle reaches >17–18 mm in diameter and estradiol levels exceed 300 pg/mL. Embryo transfer is undertaken when these criteria are met. Progesterone is provided for luteal phase support [28].

Use of GnRH agonists for the purposes of cycle downregulation was the norm in previous years. Previous studies show that there may be a benefit in live birth rates when a GnRH agonist is used in combination with estrogen and progesterone, compared to only estrogen and progesterone for endometrial preparation [29]. However, a recent Cochrane review of five randomized control trials found no benefit in their use compared to controls [24]. Furthermore, the authors who conducted a review of a total of 22 randomized controlled trials did not show a significant benefit of intramuscular versus vaginal progesterone administration. No difference in pregnancy rate was demonstrated when controls were compared to aspirin, steroids, ovarian stimulation, or hCG administration prior to embryo transfer. No benefits were found for use of any one particular protocol for endometrial preparation over another with regard to pregnancy rates after embryo transfers [24].

Conclusion

Embryo donation is a cost-effective method for infertile couples and others hoping to build a family. Numerous embryo donation agencies have been established as this concept has gained national recognition. With the controversy surrounding surplus embryo disposition being brought to the forefront, the choice of embryo

donation has been deemed a "life-affirming parenthood choice" [30]. As the number of excess embryos as a by-product of IVF increases, more couples may consider donating their embryos to other couples. This may serve as an ideal solution for couples who find embryo disposal unacceptable and wish to consider helping others who wish to become parents.

References

1. Hoffman DI, Zellman GL, Fair CC, Mayer JF, Zeitz JG, Gibbons WE, et al. Cryopreserved embryos in the United States and their availability for research. Fertil Steril. 2003;79(5):1063–9.
2. Caplan, A. The problem with embryo adoption.24 Jun 2003. www.msnbc.msn.com/id/3076556/ns/…/problem - embryo-adoption/.
3. Keenan JA, Chang J, Finger RF, Jeng G, Cornman KI, Macaluso M. National surveillance data confirm favorable outcome rates from embryo donation (abstract). Fertil Steril. 2008;90:S209.
4. Trounson A, Leeton J, Besanko M, Wood C, Conti A. Pregnancy established in an infertile patient after transfer of a donated embryo fertilized in vitro. Br Med J. 1983;286:835–8.
5. Wurmbrand MJ. Frozen embryos: moral, social, and legal implications. South Calif Law Rev. 1986;59(5): 1079–100.
6. Devroey P, Camus M, van den Abbeel E, van Waesberghe L, Wisanto A, van Steirteghem AC. Establishment of 22 pregnancies after oocyte and embryo donation. Br J Obstet Gynaecol. 1989;96(8):900–6.
7. Definition of adopted. www.merriam-webster.com. 2012.
8. The Ethics Committee of the American Society for Reproductive Medicine. American Society for Reproductive Medicine: defining embryo donation. Fertil Steril. 2009;92:1818.
9. Louisiana Revised Statutes, 6:126–133. http://www.legis.state.la.us/lss/lss.asp?doc=108443
10. Georgia Code Title 19, Chapter 8, Article 2. http://www.legis.state.ga.us/legis/2009_10/pdf/hb388.pdf
11. Crockin SL. The "embryo" wars: at the epicenter of science, law, religion, and politics. Family Law Q. 2005;39(3):599–632.
12. Meirow D, Biederman H, Anderson RA, Wallace WH. Toxicity of chemotherapy and radiation on female reproduction. Clin Obstet Gynecol. 2010; 53(4):727–39. Review.
13. Howell SJ, Shalet SM. Fertility preservation and management of gonadal failure associated with lymphoma therapy. Curr Oncol Rep. 2002;4(5):443–52.
14. Stahl PJ, Schlegel PN. Genetic evaluation of the azoospermic or severely oligozoospermic male. Curr Opin Obstet Gynecol. 2012;24(4):221–8.
15. Lee J, Yap C. Embryo donation: a review. Acta Obstet Gynecol Scand. 2003;82(11):991–6.
16. Keenan JA, Gissler M, Finger R. Assisted reproduction using donated embryos: outcomes from surveillance systems in six countries. Hum Reprod. 2012; 27(3):747–52.
17. Golombok S, Brewaeys A, Cook R, Giavazzi MT, Guerra D, Mantovani A, et al. The European study of assisted reproduction families: family functioning and child development. Hum Reprod. 1996;11(10):2324–31.
18. Practice Committee of American Society for Reproductive Medicine; Practice Committee of Society for Assisted Reproductive Technology. Guidelines for gamete and embryo donation: a Practice Committee report. Fertil Steril. 2008;90(5 Suppl):S30–44.
19. Van Voorhis BJ, Grinstead DM, Sparks AE, Gerard JL, Weir RF. Establishment of a successful donor embryo program: medical, ethical, and policy issues. Fertil Steril. 1999;71(4):604–820.
20. Devreker F, Englert Y. Implantation rates and embryo numbers. Hum Reprod. 1994;9(2):186.
21. Chang EM, Han JE, Kim YS, Lyu SW, Lee WS, Yoon TK. Use of the natural cycle and vitrification thawed blastocyst transfer results in better in-vitro fertilization outcomes: cycle regimens of vitrification thawed blastocyst transfer. J Assist Reprod Genet. 2011; 28(4):369–74. Epub 2011 Jan 13.
22. Glujovsky D, Blake D, Farquhar C, Bardach A. Cleavage stage versus blastocyst stage embryo transfer in assisted reproductive technology. Cochrane Database Syst Rev. 2012 Jul 11;7:CD002118. Review.
23. El Bahja D, Hertz P, Schweitzer T, Lestrade F, Ragage JP. [Frozen embryo transfer protocol: Does spontaneous cycle give good results?] Gynecol Obstet Fertil. 2012 Feb 15. [Epub ahead of print].
24. Glujovsky D, Pesce R, Fiszbajn G, Sueldo C, Hart RJ, Ciapponi A. Endometrial preparation for women undergoing embryo transfer with frozen embryos or embryos derived from donor oocytes. Cochrane Database Syst Rev. 2010 Jan 20;(1):CD006359.
25. Haddad G, Saguan DA, Maxwell R, Thomas MA. Intramuscular route of progesterone administration increases pregnancy rates during non-downregulated frozen embryo transfer cycles. J Assist Reprod Genet. 2007;24(10):467–70.
26. Yanushpolsky E, Hurwitz S, Greenberg L, Racowsky C, Hornstein M. Crinone vaginal gel is equally effective and better tolerated than intramuscular progesterone for luteal phase support in vitro fertilization-embryo transfer cycles: a prospective randomized study. Fertil Steril. 2010;94(7):2596–9.
27. Bjuresten K, Landgren B-M, Hovatta O, Stavreus-Evers A. Luteal phase progesterone increases live birth rate after frozen embryo transfer. Fertil Steril. 2011;95(2):534–7.
28. Konc J, Kanyo K, Varga E, Kriston R, Cseh S. The effect of cycle regimen used for endometrium preparation on the outcome of day 3 frozen embryo transfer cycle. Fertil Steril. 2010;94(2):767–8.
29. Ghobara T, Vandekerckhove P. Cycle regimens for frozen-thawed embryo transfer. Cochrane Database Syst Rev. 2008;1, CD003414.
30. Life Issues Institute. Embryo Adoption. www.lifeissues.org/embryo_adoption/index.html. 2004

Embryo Donation: Legal Aspects

10

Susan L. Crockin and Lauren M. Nussbaum

Introduction

Embryo dispositions arise in a surprisingly large number of scenarios and raise a myriad of legal issues for professionals and patients. Divorcing patients' disputes over their frozen embryos may be the most familiar scenario, but these are but one of the legal aspects involved in IVF embryo dispositions. Though less publicly debated or discussed, significant legal issues also arise when IVF patients want to donate unused embryos for research or procreation or want to discard them. Leftover embryos may remain after treatment, with dispositional choices left unsettled if patients and physicians have lost contact with one another. Finally, doctors, embryologists, and other professionals are human; while hopefully rare, errors in gamete and embryo handling, including mix-ups, are inevitable and carry significant legal repercussions and liabilities for those involved.

The intent of this chapter is to provide readers with a legal understanding of, and guidance in addressing, embryo dispositions. This chapter will first set out the legal context surrounding IVF embryos and then discuss the legal issues raised by the myriad of embryo dispositions with suggestions for addressing them.

S.L. Crockin, J.D. (✉)
Georgetown University Law Center, O'Neill Institute for National and Global Health, 600 New Jersey Ave, Washington, DC 20008, USA
e-mail: scrockin@crockinlaw.com

L.M. Nussbaum, J.D.(c), M.A.
American University Washington College of Law, 4801 Massachusetts Avenue NW, Washington, DC 20016, USA
e-mail: ln9859a@student.american.edu; lauren.nussbaum@gmail.com

Background

What Is an Embryo?

Defining an ex utero IVF "embryo" (hereinafter referred to simply as "embryo") is a surprisingly complex task. Any legal understanding of embryo disposition must begin with an appreciation of how difficult it is to provide a single, accepted legal definition of the term "embryo" and the strong tensions underlying that difficulty.

By its nature, the law typically lags behind science and is often reactive to individual disputes. In 1973, when the Supreme Court affirmed in *Roe v. Wade* that a woman's constitutional right to privacy included her choice to terminate a pregnancy, sperm and eggs met only inside a woman's body, and medical dictionary definitions of "embryo" presumed it was in utero [1]. During the mid- to late 1970s, following the legalization of abortion but before the first IVF birth in 1978, many states enacted laws designed to prohibit fetal tampering or experimentation [2].

While there may be a common understanding of embryos within the medical or scientific community, and thus little perceived need to distinguish them based on stages of development,

J.M. Goldfarb (ed.), *Third-Party Reproduction: A Comprehensive Guide*,
DOI 10.1007/978-1-4614-7169-1_10,

there is no such consensus in the law. The imprecise language found in many state statutes does not necessarily reflect increasingly sophisticated scientific developments and use of IVF procedures. Various legal definitions related to embryos appear in federal and state statutes and regulations. In some state statutes, such as Idaho's, the term "embryo" or "fetus" is used interchangeably with regard to fetal homicide and means a "human in utero" [3]. More recent assisted reproductive technology (ART) or parentage statutes have been passed in about a dozen states that permit embryo donation in the same manner as egg or sperm donation and state that embryo donors are not legal parents of the resulting child.[1] The majority of these embryo donation statutes use the term "embryo" without defining it. Four of the statutes provide definitions: Virginia defines "embryo" as "the organism resulting from the union of a sperm and an ovum from first cell division until approximately the end of the second month of gestation" [4]; Louisiana, as "an in vitro fertilized human ovum, with certain rights granted by law, composed of one or more living human cells and human genetic material and organized that it will develop in utero into an unborn child" [5]; Florida, which uses the term "preembryo," as "the product of fertilization of an egg by a sperm until the appearance of the embryonic axis" [6]; and Georgia, which defines the term as "an individual fertilized ovum of the human species from the single-cell stage to 8-week development" [7].

Despite there being no single accepted or used definition or term, appellate courts have tended to accept the legal concept of an IVF "embryo" or "preembryo" to refer to an egg fertilized by sperm in vitro, whose cell division is allowed to progress only up to the fourteenth day of development, before cell differentiation occurs and a "primitive streak" appears, a time frame well within which the great majority of IVF embryos that are implanted, discarded, or cryopreserved (typically no later than day 5 or blastocyst stage) [8].

Although not wholly consistent in language, some legal consensus seems to have evolved over both the nature of these embryos and who should control their fates in the context of divorcing couples. In 1992, in the seminal *Davis v. Davis* case, the Tennessee Supreme Court ruled that "preembryos" are neither property nor people, but entitled to "special respect" due to their capacity to become human life. In addition, the court ruled that the constitutional rights of procreation and non-procreation were implicated for the couple who created the preembryos and held that in the absence of a prior agreement between that couple, the constitutional rights of the one who wished to avoid procreation superseded those of the one who wished to procreate. In reaching this conclusion, the court relied on and adopted the now widely quoted "special respect" language from a report of the Ethics Committee of the then American Fertility Society (now the American Society for Reproductive Medicine, or ASRM): "special respect is necessary to protect the welfare of potential offspring… who might be born after transfer…" and concluded that "preembryo are not, strictly speaking, either 'persons' or 'property,' but occupy an interim category that entitles them to special respect because of their potential for human life" [9].

In the decade following *Davis*, the highest state courts in Iowa, Massachusetts, New Jersey, New York, and Washington all ruled on divorcing couples' disputes over their cryopreserved embryos. Although the courts have employed various terms such as "preembryo" and "zygote" (terms that might be helpful in understanding the significant stages of development), they each explicitly acknowledged that embryos before day 14 are unique and distinctive entities. Courts have also tended to enforce couples' prior agreements that did not involve procreation (e.g., agreements to discard or donate for research), but have refused to enforce what the Massachusetts court first termed "forced procreation": agreements to allow one ex-spouse to use the embryos to attempt a pregnancy over a change of mind and objection by the other spouse [8]. In a number of these cases, the appellate courts were overruling lower courts' decisions.

[1] See, for example, California, Colorado, Connecticut, Florida, Maryland, Massachusetts, New Jersey, New York, North Dakota, Ohio, Oklahoma, Texas, Washington, and Wyoming.

In 2012, a Maryland trial court bucked the trend of protecting an individual's right not to procreate by granting custody of nine embryos to an ex-wife over her ex-husband's desire to destroy them. The court employed contract law principles to enforce the IVF program's consent form, which gave the ex-wife custody over the embryos in the event of a separation. Interestingly, in the same procedure the court awarded the ex-husband custody over the couple's 3-year-old daughter after finding the ex-wife unfit [10]. The ex-husband has appealed the ruling, and it remains to be seen if a reversal, consistent with most appellate rulings, will result [11].

Personhood Initiatives

Since 2008, "personhood" legislation and ballot initiatives have been introduced in many states to redefine a person as existing from the moment of fertilization or conception and endowed with the full legal and constitutional rights of personhood. Much of the impetus behind these bills and initiatives has come from Personhood USA, an organization that has seized upon dictum (extraneous language) in *Roe v. Wade* to the effect that if a fetus were established to be a person, it would have a guaranteed right to life. Commentators suggest that Personhood USA has pursued this strategy to redefine a human being under state laws as an incremental approach to dismantling the constitutional right to abortion by altering the premise against personhood relied upon in *Roe* [12]. Besides attacking abortion rights, if passed "personhood" laws would also likely restrict IVF, embryo freezing, and embryonic stem cell research (ESCR). Some of the proposed initiatives also explicitly authorize criminal prosecution of personnel responsible for embryo loss [13].

So-called "personhood" bills or ballot initiatives have been defeated or abandoned in Alabama, Arizona, Colorado, Georgia, Kansas, Mississippi, Oklahoma, North Dakota, South Carolina, and Virginia [13]. However, Personhood Ohio is already gathering signatures for a state constitutional amendment on the ballot for 2013, and similar efforts in other states are likely [14]. At the federal level, Wisconsin Representative and former Republican Vice-Presidential candidate Paul Ryan has again cosponsored the "Sanctity of Human Life Act," federal legislation that declares that all life, even a "one-celled human embryo," begins with "fertilization, cloning, or its functional equivalent" and grants embryos "all the legal and constitutional attributes and privileges of personhood" [15]. Interestingly, opponents of these bills found that the prospect of outlawing or restricting IVF, as opposed to outlawing abortion, was an effective and powerful counterargument in states such as Virginia. Even where advocates of the legislation attempted to carve out an exception for IVF treatment, prominent physicians, including Dr. Howard Jones of the Jones Institute in Virginia, the first IVF program in the USA, pointed out problems with the law such as subjecting a physician to prosecution for treating a patient with an ectopic pregnancy if the fetus were deemed a person [16].

For purposes of this chapter, readers should be mindful that passage of any such "personhood" legislation would potentially have a devastating impact on patient choices surrounding embryo disposition and provider liability in the event of embryo destruction, mix-up, or misuse. The remainder of this chapter assumes that such extreme measures will not be enacted and that current law and prevailing views on embryos and women's reproductive rights remain intact.

Patient Choices

Couples undergoing IVF are routinely required to complete a medical program's cryopreservation consent form or "agreement," which is intended to address and resolve issues regarding the disposition of any cryopreserved embryos in a variety of future circumstances. Whether these documents are legally construed as contracts, which typically can only be modified if all parties agree (and are consistent with public policy), or informed consent documents, which may be changed or withdrawn up until the object of the consent occurs, varies by state. In many states, these issues have not been addressed. Courts tend

to rely on contract, family, and health law, on any relevant state ART or parentage statutes (and any helpful legislative history), and any constitutional limitations, depending on the particular circumstances [8].

IVF patients starting treatment should be required to make and record a mutual, initial decision about how they want their IVF program to dispose of any leftover frozen embryos. Ideally, patients should be asked to reaffirm any decision at the time of any actual proposed disposition (other than authorized discard), and professional guidelines require reaffirmation for donation for either procreation or research. For a myriad of reasons, preferences may change and mutual changes of mind are typically respected. ASRM guidelines are clear that no donation for procreation should be made without contemporaneous consent of the prospective donors for that purpose [17].

IVF patients typically are presented with several embryo disposition "options" when approaching IVF treatment. Not every IVF program offers every option, but the possibilities include procreative use by one of the two patients who created the embryos (discussed above); donation for procreation to another patient (known, designated, or anonymous); donation for specifically identified research, including ESCR; and discard for destruction. A final, "non-option" abandonment, arises when patients fail to record a choice and are unreachable to make a disposition decision. At the request of its members, in 2009, the Society for Assisted Reproductive Technology (SART) attempted to standardize these options and produced a "model consent," which clearly sets out the options and designates a "default" option of discard, if no other choices are available, in an effort to avoid abandonment and decrease the number of unclaimed embryos. The model consent, available only to SART member programs, is intended as a mere model, to be used only when formalized in conjunction with local law and counsel.[2]

[2] Because the model consent is only available to SART member programs, the citation provided is an example of the model consent as modified and made public by a particular program [18].

Donation for Procreation

Embryo donation for procreation is frequently offered as an option for unused embryos. A published report in 2003 estimated that there were 400,000 embryos in storage in IVF clinics in the USA [19]. While that number has likely grown over the past decade, research also showed that approximately 88 % of frozen embryos were being held for future family building by the patients who created them. Only about 2 % were designated for donation for procreation, with approximately the same small percentage designated for donation for research [19].

At the federal level, embryo donation for procreation was encouraged by the George W. Bush administration by earmarking funds for an "awareness campaign" for "embryo adoption," and waiving FDA screening and testing requirements for cryopreserved embryos intended for donation to "enhance the availability of embryos for donation" [20]. While the Obama administration has retained the FDA regulations, in its FY2013 budget it declined to fund the awareness campaign, which had received a total of over $16 million in funding the previous 5 fiscal years [21].

In 12 states, embryo donation statutes clarify the legal status of the parties and any resulting child.[3] These laws range from a straightforward mirror image of sperm donation laws to more comprehensive statutory schemes that encompass egg and embryo donation, as well as surrogacy arrangements. The Uniform Parentage Act (2002), a model law,[4] proposes that many of the parentage issues for children born from donor gametes, embryos, or surrogacy (traditional or gestational) should turn solely on the intent of the parties, not genetics. Following this trend, all of the state embryo donation statutes, except Louisiana's, explicitly relieve an embryo donor from all parental rights or responsibilities and transfer such rights to the intended parent(s).

[3] Florida, Georgia, Louisiana, New Mexico, North Dakota, Ohio, Oklahoma, Texas, Utah, Virginia, Washington, and Wyoming.

[4] Available for states to enact, in whole or in part, but not itself a binding law.

The laws typically require prior written consents of both the donors and the recipients. Five of the embryo donation statutes explicitly apply only to married recipients by use of terms such as "husband and wife" or "born within wedlock."[5]

Only the Georgia and Oklahoma statutes require court involvement, though the Georgia statute allows the court, "[i]n the interest of justice, to promote the stability of embryo transfers, and to promote the interests of children who may be born following such embryo transfers, [to] waive such technical requirements as the court deems just and proper" [7]. Louisiana is the only state where an IVF embryo is legally deemed a human, possessing all the rights associated with personhood. The law states that the embryo cannot be owned or destroyed by either the "in vitro fertilization patients" or the clinic, which may be deemed a "temporary guardian," until "adoptive implantation" by "another married couple" can occur. By giving infertility patients only one dispositional option, the Louisiana statute denies adults decision-making control over their embryos and could be vulnerable to a constitutional challenge based on procreative liberty [8].

In the majority of states without laws on embryo donation, or for patients who fall outside of their protections, medical programs, at a minimum, should require clear informed consents addressing all parties' rights and obligations to the embryos and resulting children, loss of or damage to embryos, the program's right to refuse transfer if it deems a patient an inappropriate recipient, the time the embryos may remain frozen, alternative dispositions, and dispute resolution procedures. In addition to the consent process and forms, programs should also require mental health counseling, as reflected in current ASRM guidelines, and evidence of legal agreements between the donors and the recipients themselves [17]. These contracts should clearly define each party's respective roles, obligations, intentions, and expectations regarding the donation and any resulting child(ren), with independent legal counsel to separately advise donors and recipients as to their interests, including whether in their specific states a pre- or post-birth order of parentage, and/or a post-birth adoption may be recommended as legally protective for the offspring and all involved [8].

Regarding "anonymous" donation, it is prudent to note that even so-called ironclad contracts or program "guarantees" of anonymity may not be enforced by some courts or in the future. Given the ever-greater availability of personal and genetic information, as well as the increasingly accepted view of one's fundamental right to know her or his biological origins (at least in the adoption context), courts may be moving away from donors' and recipients' right to keep embryo (and gamete) donation procedures private [8]. In addition, ad hoc efforts to obtain donor gamete and embryo information with the help of social media and other modern tools have proven successful in a number of anecdotally reported instances.

In contrast to statutes that model embryo donation on sperm or egg donation laws, some religious and politically based groups promote the practice of embryo donation as embryo "adoption." Louisiana, as well as Florida and Georgia (to varying degrees), uses embryo "adoption" language in their statutes. Embryo "adoption" is a legal misnomer, conflating embryos with born children and implying the utilization of state adoption procedures. In 2009, the ASRM Ethics Committee issued a statement specifically rejecting the term [22]. Even religiously based programs such as Snowflakes and Embryos Alive, which refer to embryos as "unborn children" and promote adoption terminology, acknowledge that they are not referring to adoption in a legal sense and that no court procedure is required, as in traditional adoptions. Adoption laws prohibit biological parents from relinquishing their parental rights until after a child is born, impose detailed and comprehensive screening and qualification requirements for prospective adoptive parent(s), and typically require court and state involvement. Applying this model to embryo donation raises concerning questions such as when embryo donors would be considered to have "relinquished their rights," if and

[5] Florida, North Dakota, Oklahoma, Texas, and Washington.

when they can change their minds about their decision, and who "screens" recipients for parental fitness. For example, Snowflakes has a "strong preference" for "adopting" parents to be married for at least 3 years, warns that single mothers may wait longer for a placement due to "genetic" parents' specifications, and further requires that "adopting" parents agree not to abort or selectively reduce any resulting pregnancy [23].

In 2010, countersuits were filed between two couples—Snowflake donors and recipients—over two remaining embryos the donors requested be returned to them so that they could be donated to another family. The recipients, who had already given birth to twins from two of the embryos they had received, refused the request, despite a provision in the embryo "adoption" contract that provided for the embryos' return to the donors if they were not implanted within a year. The recipients claimed that the remaining embryos were essentially unborn siblings of the twins they had already delivered and that notwithstanding their own agreement to the contract terms regarding the embryos' return, the rights of the embryos as unborn children trumped the contract. The case was ultimately settled privately but highlights the difficult ambiguities that such characterizations can cause [24, 25].

Donation for Research

Donation for research purposes has long been an option for unused embryos, and anecdotally IVF clinics report that donation for research is an increasingly popular option as public awareness of ESCR has grown. President Obama has renewed the scientific community's hope that ESCR will earn greater governmental support. While the federal Dickey–Wicker amendment remains, banning the use of federal funds for research in which embryos are destroyed or discarded, the Obama administration has abandoned its predecessor's restrictive interpretation of the amendment as preventing the creation of new stem cell lines from privately created and unused embryos. In 2009, following President Obama's Executive Order expanding ESCR opportunities, the NIH issued guidelines allowing researchers to use stem line cells derived from donated embryos. Rejecting a lawsuit brought by adult stem cell researchers claiming their own access to federal funding was compromised, a federal court of appeals upheld the Obama policy as complying with the Dickey–Wicker amendment, a decision the Supreme Court recently declined to review [26].

At the state level, recently enacted statutes reflect the public's and policymakers' inconsistent positions on stem cell research. Although virtually all prohibit reproductive cloning, some promote ESCR, including "therapeutic cloning" (California, Connecticut, Massachusetts, and New Jersey), while others, such as South Dakota, strictly forbid research on embryos regardless of their source. According to the National Conference of State Legislatures, as of January 2008, 33 states had enacted human cloning legislation or regulations, which either banned reproductive cloning altogether or restricted the use of public funds for that purpose. A number of those states ban reproductive cloning[6]; others address the use of public funds for cloning.[7] Some states, as well as ASRM guidelines, prohibit payments to reproductive donors [27]. (While embryo research donors remain unpaid, New York recently decided to explicitly authorize payments to women who donate eggs for research purposes [28].)

With the growing interest in ESCR, some states, including California and Massachusetts, have passed stem cell laws that include explicit disclosure requirements for all research donors. The California law, for example, requires programs to remove all identifiers, disclose the commercial potential of any donated material, and retain samples for a lengthy period of time [29]. The Massachusetts law contains comprehensive and extremely detailed informed consent provisions, including a definition of "informed consent" as "the written consent for the donation of gametes or embryos used for research conducted pursuant to this chapter which complies with the

[6] See, for example, Arizona, Arkansas, Indiana, Iowa, Massachusetts, Michigan, Rhode Island, New Jersey, North Dakota, South Dakota, and Virginia.

[7] See, for example, Arizona and Missouri.

requirements of a duly appointed institutional review board… as may be amended from time to time… and shall include all reasonably foreseeable risks, discomforts or benefits of the procedure to the donor or patient" [30].

Ethical guidelines issued by the National Academy of Sciences (NAS), as well as voluntary professional guidelines and ethical statements issued by the ASRM, are in place to govern embryo donation for stem cell research. In April 2005, the NAS published extensive suggested guidelines (updated in 2010) to provide "an oversight process that will help to ensure that [ESCR] is conducted in a responsible and ethically sensitive manner and in compliance with all regulatory requirements pertaining to biomedical research in general" [31].

The NAS requires that all donations for ESCR purposes be the product of voluntary, informed consent. When donor gametes were used in the IVF process, consent of all gamete donors is required as well. The required informed consent should be obtained at the time of the donation, even when the person has given prior indication of his or her intent to donate to research [31]. The 2009 ASRM Ethics Committee Report on donating spare embryos for research makes clear that informed consent must be given by patients only after completing treatment and that neither abandoned embryos nor those for which research was offered and elected but that did not inform of the possibility of stem cell research may be used for such research [27]. Interestingly, recently expanded stem cell research options, which are reportedly of interest to an increasing number of IVF patients, may partially reduce the number of stored embryos.

Discard

Given the general consensus that patients should control their own genetic material, virtually every IVF program (outside of Louisiana) gives their patients at the outset of treatment the option to discard any embryos that may remain unused. A valid written directive to discard should be honored without the need for patients to affirm the decision at the close of treatment. In the few reported cases involving a patient's change of mind following a couple's joint decision to discard, courts have enforced the original decision. If, however, a state law recognizes embryos as entities with rights, such as in Louisiana or in a state that passed a personhood law, discard might violate such law. Apart from legal considerations, some patients, theologians, and ethicists remain troubled by the destruction of embryos as analogous to the destruction of human life [8].

Abandonment: The Non-choice

Patients may relocate, die, or lose contact with IVF programs, leaving their cryopreserved embryos literally frozen in limbo. Previously executed consent forms or agreements may not have set out default provisions for disposition under these circumstances. There are no known reported cases involving disputes over IVF programs' decisions to discard either abandoned embryos or those with prior instructions to discard. Without sufficient guidance from the courts or legislatures, and unable to contact patients for further instructions, programs are hesitant to discard such embryos, fearing liability if their former patients reappear [8].

In 2004, the ASRM issued an ethical statement reiterating that programs should require patients to give written instruction on embryo disposition "in the case of death, divorce, separation, failure to pay storage charges, inability to agree on disposition in the future, or lack of contact with the program." The statement permits clinics to discard "abandoned" embryos, defined as instances where patients neglected to provide a dispositional choice for their embryos and lost contact with their IVF program for a time period of at least 5 years, despite the program's "diligent efforts" to locate them [32].

IVF programs should clearly inform patients of their dispositional options in every foreseeable contingency, including the merger or closure of programs themselves. A patient's permanent address, Social Security number, and driver's license are all appropriate to request and keep on file to avoid abandonment. That said, programs may also elect to shift the presumptive burden of resuming contact to the patient, a protocol that may reduce their future liability.

In 2009, SART drafted a model ART consent form, which includes a Disposition of Embryos Statement. The statement, which, like the rest of the model consent, is both optional and modifiable to conform to state law, notes the importance of deciding on the disposition of any excess embryos before undergoing any procedures, given the possibility of "separation, divorce, death or incapacitation after embryos have been produced." The statement mentions four alternatives (donation for research, donation for procreation, patient's use, and discard) and provides that "in the event that either our chosen dispositional choices are not available or we fail to preserve any choices made herein, whether through nonpayment of storage fees or otherwise, the clinic is authorized to discard and destroy our embryos." Similar language is repeated, in bold, two more times [18]. Thus, for clinics using this model consent, discard is the clearly stated default option and should enable discard. However, clinics may still be reluctant to follow through with discard even when patients have signed such a consent form or meet the professional standards of embryo abandonment referenced above.

The Professional's Responsibility and Vulnerability in IVF Embryo Disposition

An important legal aspect of embryo disposition is professional liability for their actions or inactions. The very earliest cases involving embryos centered on physicians' roles in handling or refusing to release embryos to the patients who created them.[8] Since then, patients have brought lawsuits for intentional or inadvertent loss, misappropriation, or embryo mix-ups. Cases have been brought against physicians, embryologists, IVF programs, embryology labs, genetic testing facilities, donor banks, facilitators or matching programs, escrow agents, lawyers, and miscellaneous supporting individuals. Civil claims and licensing investigations are much more common than criminal prosecutions; the latter have focused on substantial misdeeds by medical, legal, and other professionals, including intentional mix-ups of embryos that have resulted in children. Incarceration, probation, monetary fines, and loss of license are all possible consequences for professionals or practices found culpable in extreme situations [33].

To understand the potential types of claims requires an understanding of both the variety of legal theories that can be used, as well as the respective roles, responsibilities, and standards of care applied to various professionals. Professional liability for a breach of contract claim may turn not only on whether there was a breach but also on whether the original contract is found to be consistent with public policy. A tort claim is typically brought for negligent or intentional acts or for professional malpractice, essentially alleging a failure to adhere to an applicable standard of care, which in turn resulted in harm to the patient. All contract and tort claims are based on state law, which vary considerably. Criminal prosecutions, which can be state or federal, depending on the nature and scope of the alleged violation, must be brought under a particular statute and usually require a specific intent [33].

Very little law exists on the applicable standards of care specifically involved in ART practices. Medical professionals should consult state-specific laws and professional guidelines such as those promulgated by the ASRM, the AMA, and other organizations. For lawyers, state-specific malpractice law and ethical and professional rules will all be relevant [33].

Embryo Mix-Ups

Embryo mix-ups raise both questions of legal parentage and issues of provider liability. If a

[8] See, for example, Del Zio v. Columbia Presbyterian Medical Center (1978) No. 74–3558, 1978 U.S.Dist. LEXIS 14450 (S.D.N.Y. Nov. 14, 1978) (holding the medical program liable for destroying embryos due to medical concerns regarding implantation); York v. Jones (1989) 717 F. Supp. 421 (E.D.Va. 1989) (holding that the couple, not the medical program, had exclusive custody over their frozen embryos despite contractual language regarding embryo disposition that did not address removing embryos from medical program).

mix-up of gametes or embryos results in a live birth, potentially explosive custody and malpractice battles may arise with unpredictable resolutions. Outcomes may turn on a number of factors, including when the discovery was made, whether the mix-up involved donor gametes or embryos (as opposed to both intended parents' own genetic material), state law, as well as the original intentions and subsequent responses of the multiple, impacted patients. Because no state has a statute specifically addressing parentage in such situations, general state parentage and adoption laws, as well as constitutional law principles, will guide any parentage and custody resolution. Cases have been brought in at least a few states, including California, New York, and Michigan, and a number of additional such mix-ups have been settled quietly outside the courts [33].

Courts in New York and California refused to rule that intended parents in embryo mix-ups should be considered donors. In the California case, *Robert B. v. Susan B.*, the court refused to find the husband to be a sperm donor of a child born from his sperm and a donor egg that was mistakenly implanted in another woman, ruling that the husband was the father and the woman who carried the pregnancy—not the father's wife—was the mother [34]. In the New York case, *Perry-Rogers v. Fasano*, a couple's embryo was mistakenly implanted into a patient who was also implanted with her own embryo and then gave birth to two children of different races. After the Perry-Rogers brought suit, the Fasanos relinquished custody of their genetic child, but only on the condition of regular visitation. This agreement broke down and the parties returned to court. The court ruled that the genetic parents were the sole legal parents and denied the Fasanos any visitations rights [35]. In a third widely publicized case, a woman who was mistakenly implanted with another couple's embryos voluntarily completed the pregnancy and relinquished the child to the genetic parents [36]. In each of these three cases, the parties also brought suits against the physicians or medical programs responsible for the errors.

When these situations arise, patients and programs may have conflicting interests. Given that both sets of patients probably already experienced significant difficulties and efforts in trying to conceive, recipients may not want to inform the genetic parents of the mix-up, who would likely want to assert custody rights over any resulting child. Professionals may also feel tempted to hide such errors out of fear of exposure and liability. Despite such reluctance, the ASRM Ethics Committee has made clear that "it is obligatory to disclose immediately errors in which the wrong sperm are used for insemination or gametes or embryos are mistakenly switched and the result is embryo transfer, conception, or the birth of a child with different genetic parentage than intended" [37].

The Committee also states that medical providers have an ethical obligation to immediately disclose to their patients *any* errors involving gametes or embryos unless they clearly have a minimal effect on patient interests. The Committee lists possible errors, including insemination with the wrong sperm, implantation with the wrong embryo, or the birth of a child with an unintended genetic parentage. The Committee encourages clinics to "promote a culture of truth-telling" by establishing written procedures for error disclosure [37].

In cases where lost, mishandled, or mixed-up embryos do *not* result in a child, the consequences, while serious, are less severe, the potential damages are more limited, and settlements, before or after a lawsuit is filed, are more likely [38].[9] Where liability and the roles of respective professionals in any loss are less clear, litigation may be necessary to resolve unsettled facts and damage claims. In one such case, former patients of the now-closed Ochsner Fertility Center in New Orleans sought class action status in a suit against the Center for allegedly mishandling and mislabeling embryos. The Center attempted to argue that the case was one of medical malpractices,

[9] There have been numerous cases in which individual couples have filed suit or threatened to do so, where liability is clear, such as where an individual couple, who has undergone IVF treatment and returned to use their frozen embryos, finds that they have been inadvertently destroyed or discarded [39, 40].

which would have limited liability and monetary damages, but the court found that storage of embryos performed by nonphysician embryologists was not medical treatment (going so far as to say a trained high school student could perform these functions), and malpractice protections were thus not available to the defendant embryologist or program. While the court found against the Center on that issue, a finding that was upheld on appeal, other aspects of the case are still ongoing, and the plaintiffs' attempts to certify a class of patients have raised interesting issues of privacy for those patients who have not agreed to release of their identities. The most recent court decision allowed some, but not all, of the requested classes to be certified in light of the difficulty determining which patients' alleged damages were sufficiently similar.

Professional Liability/Duty of Care for Non-MDs

In 2011, two attorneys, Theresa Erickson and Hilary Neiman, as well as their nonlawyer accomplice, Carla Chambers, all pled guilty in federal court to criminal conspiracy to commit wire fraud for transmitting and filing fake documents in connection with an international surrogacy scheme they had devised. The three women recruited American gestational surrogate carriers, sent them to the Ukraine to be implanted with embryos created from unrelated donor sperm and eggs, and, after their return to the USA, matched them with American couples under the false pretense that the surrogates had been abandoned by their original (nonexistent) intended parents. The lawyers then misrepresented to the court that the arrangements had been made prior to implantation to obtain court orders of parentage in California. Unlike many states, California recognizes legal parentage based on intention at the outset of a pregnancy regardless of genetics, but a pre-birth agreement is required. As with many schemes, without a specific law that had been violated, charges were brought under federal mail or wire fraud statutes since the fraudulent scheme involved money and correspondence crossing state lines.

The scheme, considered by many to be baby manufacturing or baby selling, reportedly involved at least 40 families (and possibly many more). The intended parents and gestational carriers were found to have been largely unaware of the illegal activities; thus, none were prosecuted. The families have been advised to undergo an adoption to ensure the child they are parenting will be legally recognized as their own. Attorney Neiman was sentenced to 5 months in jail and 7 months of home confinement; Attorney Erickson was fined $70,000 and sentenced to 5 months in prison, followed by 9 months of home confinement [41].

Following this case, California passed a more stringent surrogacy law requiring surrogates and intended parents, who must be represented by separate counsel, to execute a surrogacy contract that is notarized prior to any embryo implantation [42].

Looking Forward

As mentioned above, scientific advances rapidly outpace legal ones. Even as a tentative consensus slowly develops in state courthouses and legislatures regarding legal interpretations of embryos and their various dispositions, science races forward, creating new innovations and paradigms to which ethics and the law will struggle to respond. Below are a few advances that may render certain legal paradigms—including dispositional issues—less pressing.

Embryo Creation

In 2012, reports surfaced that the California IVF: Davis Fertility Center, Inc., which runs a California Conceptions Donated Embryo Program, guarantees patients a pregnancy for $9,800 with embryos created through donor gametes. The procedure is roughly half the cost of IVF at other clinics, where patients use their own gametes, because the program doctors create a

single batch of embryos from one egg donor and one sperm donor and then implant the embryos in three to four different patients. The clinic—not the patient(s)—controls the embryos because the gamete donors have disavowed any parentage rights prior to any "match" with intended parents. Many critics of the program, who condemn the practice as the commodification of children, have been pressing for an end to, or at least an ethical statement condemning, the practice. The program justifies its practice by noting that it is expanding economic access to fertility treatments, which are otherwise only available to those who are able to pay tens of thousands of dollars. An alternative perspective would suggest that this demand demonstrates the continued need to press for expanded insurance coverage for infertility treatment, much as consumer advocates have done with significant success in the past years [43]. The ASRM Ethics Committee planned to discuss the business model as this chapter went to press [44].

Egg Freezing

Egg freezing is an increasingly available and attractive option for many patients. The ASRM lifted its "experimental" label from oocyte cryopreservation in October 2012, noting that pregnancy rates and health outcomes for IVF children born from frozen eggs are comparable to those born from fresh eggs. In its announcement, the ASRM declared that egg freezing could provide a "viable alternative source of tissues" for individuals and couples needing donor eggs to build their families due to infertility, genetic conditions, or interrupted IVF treatment. However, the ASRM Practice Committee refrained from endorsing widespread use of egg freezing for elective use to delay childbearing due to a stated lack of data on "safety, efficacy, cost-effectiveness, and potential emotional risks." In addition, it noted that egg freezing "may not be appropriate for the older woman who desires to postpone reproduction" [45].

As egg freezing becomes more mainstream and widely utilized, it is possible that IVF patients may ultimately produce fewer embryos, reducing many of the dispositional challenges outlined in this chapter. Without the experimental limitation, it is predicted that egg freezing will ultimately be used not only for donation but also for some women who may need or want to delay childbearing, who do not have current or permanent partners, or for other personal reasons.

It is unlikely, however, that couples approaching IVF to build their families will choose to freeze eggs and sperm rather than embryos on the unanticipated possibility that they may later divorce and fight over unused embryos. As such, embryo disposition issues will continue to be a concern for practitioners and patients, who will want to ensure the legal aspects of embryo disposition are fully addressed as patients move forward with their family building efforts. This chapter has hopefully shed some light on the issues involved and practices that are recommended to address those legal aspects.

References

1. Roe v. Wade (1973) 410 US 113.
2. Crockin SL. What is an embryo?: A legal perspective. Conn Law Rev. 2004;36:1177–86.
3. Criminal Procedure—Killing Human Embryos or Fetuses. 2002 Idaho Laws Chapter 337, § 1.
4. Assisted Conception—Definitions; Parentage. 1997 Va Laws Chapter 81.
5. Human Embryo; Definition. La Acts 1986, No 964, § 1.
6. Family Law—Paternity—Reproductive Technology. 1993 Fla Sess Law Serv Chapter 93–237.
7. Domestic Relations—Adoption—Relinquished Embryos. 2009 Ga Laws Act 171.
8. Crockin SL. The "embryo" wars: At the epicenter of science, law, religion, and politics. Fam Law Q. 2005; 39:599–632.
9. Davis v. Davis (1992) 1992 WL 341632.
10. Henneberg B. Maryland woman wins custody of frozen embryos. Greenbelt Patch. 2013 Jan 7. http://greenbelt.patch.com/articles/judge-awards-maryland-woman-custody-of-frozen-embryos?national=patch&ncid=edlinkuspatc00000006.
11. Circuit Court of Maryland. Case Search: Mbah v. Anong. 2 Feb 2013. http://casesearch.courts.state.md.us/inquiry/inquiryDetail.jis?caseId=CAD1111394&loc=65&detailLoc=PGV.
12. The 'personhood' initiative. The New York Times. 2011 Oct 28;Sect A30. http://www.nytimes.com/2011/10/28/opinion/the-personhood-initiative.html?_r=0.

13. Collins LR, Crockin SL. Fighting 'personhood' initiatives in the United States. Reprod Biomed Online. 2012;24:689–91.
14. Personhood Ohio [Internet]. What is the Ohio Personhood Amendment. http://www.personhoodohio.com/about.
15. Sanctity of Human Life Act, H.R. 23, 113th Cong, 1st Sess (2013).
16. Jones HW Jr. The dangers of 'personhood' bills. The Virginian-Pilot. 31 May 2012. http://hamptonroads.com/2012/05/dangers-personhood-bills-0.
17. American Society for Reproductive Medicine. Recommendations for gamete and embryo donation: a committee opinion. Fertil Steril. 2013;99(1):47–62.
18. Reproductive Resource Center [Internet]. Informed consent for assisted reproduction. http://www.rrc.com/resources/SART.RRC.IVF.Consent.pdf.
19. Hoffman DI, Zellman GL, Fair CC, Mayer JF, Zeitz JG, Gibbons WE, et al. Cryopreserved embryos in the United States and their availability for research. Fertil Steril. 2003;79(5):1063–69.
20. Human cells, tissues, and cellular and tissue-based products; Donor screening and testing, and related labeling, 72 Fed Reg 33,667 (June 19, 2007) (codified at 21 CFR § 1271.90).
21. Department of Health and Human Services, General Department Management, Fiscal Year 2013 (2012).
22. American Society for Reproductive Medicine. American Society for Reproductive Medicine: defining embryo donation. Fertil Steril. 2009;92(6):1818–19.
23. Snowflakes Embryo Adoption Program [Internet]. Information for Adopting Parents. http://www.nightlight.org/wp-content/uploads/2012/01/Snowflakes-facts.pdf.
24. Lee HK. Legal fight over embryo custody is settled. San Francisco Chronicle. 15 May 2010. http://www.sfgate.com/bayarea/article/Legal-fight-over-embryo-custody-is-settled-3264650.php.
25. Harris J. Couples clash over frozen embryo custody. Courthouse News Service. 12 Apr 2010. http://www.courthousenews.com/2010/04/12/26303.htm.
26. Savage DG. Supreme Court rejects challenge to Obama stem cell policy. Los Angeles Times. 7 Jan 2013. http://www.latimes.com/news/politics/la-na-nn-supreme-court-obama-stem-cells-20130107,0,1542922.story.
27. American Society for Reproductive Medicine. Ethics committee report: donating spare embryos for stem cell research. Fertil Steril. 2009;91(3):667–70.
28. New York Stem Cell Science [Internet]. Statement of the Empire State Stem Cell Board on the Compensation of Oocyte Donors (2009). http://stemcell.ny.gov/node/227.
29. Health Care—Human Embryos—Donations. 2003 Calif Legis Serv Chapter 507.
30. Regenerative Medicine—Informed Consent. 2005 Mass Legis Serv Chapter 27.
31. National Academy of Sciences. Final report of the National Academies' human embryonic stem cell research advisory committee and 2010 amendments to the National Academies' guidelines for human embryonic stem cell research. Washington, DC: The National Academies Press; 2010.
32. American Society for Reproductive Medicine. Disposition of abandoned embryos. Fertil Steril. 2004;82(1):S253.
33. Crockin SL, Altman AB. Statutory and case law governing the practice of third-party reproduction. In: Sauer MV, editors. Principles of oocyte and embryo donation. London: Springer; 2013.
34. (2003) 135 Calif Report 2d 785.
35. (2000) 276 AD2d 67.
36. James SD. Shannon Morell: Embryo mix-up gave miracle baby. ABC News. 4 May 2010. http://abcnews.go.com/Health/embryo-mix-mother-shannon-morell-writes-book-miracle/story?id=10522218.
37. American Society for Reproductive Medicine. Disclosure of medical errors involving gametes and embryos. Fertil Steril. 2011;96(6):1312–14.
38. Hebert v. Ochsner Fertility Clinic (2012) 2012 WL 4898784.
39. James S. California couples sues doctor over "lost" embryos. ABC News. 23 August 2011. http://abcnews.go.com/Health/california-couple-sue-fertility-doctor-lost-embryos/story?id=14355815.
40. Kowalczyk L. Couple sue Brigham over embryos' disposal. The Boston Globe. 16 May 2009. http://www.boston.com/news/local/massachusetts/articles/2009/05/16/couple_sue_brigham_over_embryos_disposal/?page=full%29.
41. Surrogacy lawyer Theresa Erickson pleads guilty. San Francisco Chronicle. 25 Feb 2012. http://www.sfgate.com/crime/article/Surrogacy-lawyer-Theresa-Erickson-pleads-guilty-3360450.php.
42. Surrogates—Contracts—Actions and Proceedings. 2012 Calif Legis Serv Chapter 466.
43. Resolve: The National Infertility Association [Internet]. Insurance Coverage. http://www.resolve.org/family-building-options/insurance_coverage/.
44. Zarembo A. An ethics debate over embryos on the cheap. Los Angeles Times. 19 Nov 2012. http://articles.latimes.com/2012/nov/19/local/la-me-embryo-20121120/2.
45. American Society for Reproductive Medicine [Internet]. Press Release: Fertility experts issue new report on egg freezing; ASRM lifts experimental label from technique. 22 Oct 2012. http://www.asrm.org/Fertility_Experts_Issue_New_Report_on_Egg_Freezing_ASRM_Lifts_Experimental_Label_from_Technique/.

Embryo Donation: Psychological Aspects

11

Lindsay Childress-Beatty

Introduction

Embryo donation shares characteristics of, and is also distinct from, other forms of family building that involve the use of assisted reproductive technology (ART) in the quest for a child. Rather than one parent having a genetic link, as found in donor insemination or egg donation, both parents share a similar lack of genetic connection to the resulting offspring. The fact that the parents raise a child with whom they do not share a genetic connection makes embryo donation more akin to adoption. Yet parents have an important prenatal gestational connection with the child not found in adoption. In some ways, embryo donation may also challenge the boundaries of our Western concept of family by connecting two separate family units of parents and genetically full siblings. In that manner, it may be more controversial than the use of donated gametes. Indeed, among those working in fertility clinics in the UK, there appears to be less ambivalence over donation of excess embryos to research than to another couple, and those using donated embryos to build their family were seen as needing the most counseling, even when compared to those using donated gametes [1]. In spite of the parallels to aspects of other forms of family building, the importance of unique combination of characteristics embryo donation's calls out for separate consideration in research and counseling.

The State of the Research on Embryo Donation

The research on the psychological aspects of embryo donation is characterized by its very absence. Apart from research concerning the decision by donor couples to relinquish excess embryos for various purposes, little research specifically considering the psychological aspects of embryo donation exists. Very few research studies have considered the impact of embryo donation on the child and families created by such means or on the families who have donated. The little research that does exist is plagued by small sample sizes, homogenous demographic characteristics, and the use of self-reports. Numerous articles utilize the same small samples. For some areas of inquiry, qualitative rather than quantitative research is the norm. This dearth of research is not surprising, given the limited number of children conceived by embryo donation to date. However, given the requirements or recommendations in many countries for counseling regarding psychosocial issues, more research is clearly needed.

L. Childress-Beatty, J.D., Ph.D. (✉)
Ethics Office, American Psychological Association,
750 First Street NE, Washington, DC 20002, USA
e-mail: LChildress-Beatty@apa.org

J.M. Goldfarb (ed.), *Third-Party Reproduction: A Comprehensive Guide*,
DOI 10.1007/978-1-4614-7169-1_11,

The Decision to Use Donated Embryos for Family Building

The decision by recipient couples to use donated embryos has received little attention in the research. The decision often occurs after repeated failed ART procedures [2] and lengthy periods of trying to start a family [3]. Couples may choose to pursue embryo donation because it is less costly than using donated gametes [4] or adoption. It may be a faster route to parenthood [5] or appear to provide more control to the couple than adoption. Recipient couples may view the process as one with fewer challenges and unknowns in terms of timing, physical characteristics and racial and ethnic background of the offspring, screening requirements, and prenatal exposure to toxins and alcohol. Recipient couples may fantasize that the resulting child will fit seamlessly into the extended family with no hint of the absent genetic connection. Indeed, some recipient couples may have a bias that the donated embryos will be healthier and have a superior genetic inheritance than adoption because of the higher socioeconomic status of most couples using IVF [6]. Conversely, couples using donated embryos may also fear that those embryos are not as healthy as those used by the donor couple to build their family [6]. The actual process of creating a family via embryo donation may be more logistically and psychologically complex than consciously acknowledged by the couple.

Certainly, the chance to experience pregnancy and childbirth may be a significant benefit over adoption for many couples. In addition to control over the prenatal environment, the pregnancy allows the couple to experience typical social and communal rites of passage into parenthood via pregnancy and childbirth, such as baby showers, prenatal birthing classes, and shared discussion of pregnancy symptoms and childbirth experiences. The experience of pregnancy also contributes to the mother's perception of self as mother [7]. In addition, family dynamics and perceptions of future parenting may play a role in the decision. Some couples may choose embryo donation to have equity between them through a parallel, rather than one-sided, lack of genetic connection to the child [5]. This aspect may be important as they consider the relationship of each of their extended families to the resulting child. Recipient couples may also be comforted by the new research on epigenetics. In addition to the benefit of having control over the prenatal environment, the couple may consider possible impact of the prenatal environment on gene expression as a form of genetic tie to the resulting child.

Impact of Embryo Donation on the Psychological Functioning of the Resulting Child

An important question for practitioners, donor and recipient parents, and society at large is whether children conceived via donor embryo have psychological difficulties later in life. In spite of the societal ambivalence over embryo donation, research to date does not suggest adverse psychological outcomes for embryo-donation children. This is consistent with findings regarding children conceived using assisted reproduction generally [8, 9].

Like most areas of donor embryo conception, research on the psychological functioning of the children conceived is lacking. Two main studies utilized a small sample of British donor embryo families and compared them to two other family constellations—families with a child conceived via IVF with the parents' own gametes and those with a child adopted prior to 12 months of age [3, 10]. One other sample considered children conceived at 18 UK clinics and 1 US fertility clinic [11]. These three studies appear to be the sole research on the psychological functioning of children conceived via donor embryo currently available in English. In these limited samples, the overwhelming majority of parents were British Caucasians, and embryo-donation mothers and fathers were older than the comparison parents.

Based on this very limited research, embryo-donation children do not appear to be at increased risk for negative psychological functioning. This lack of negative psychological functioning seems to hold both for early life and functioning in later childhood. Pre-elementary school embryo-donation children did not significantly

differ from IVF children in terms of hyperactivity, conduct problems, emotional symptoms, and peer problems [3]. Similarly, preschool embryo-donation children did not significantly differ from adopted children on the same characteristics, with the exception that adopted children scored significantly higher on the measure of conduct problems [3]. This trend of emotional health for embryo-donation children held true for middle childhood as well, regardless of whether rated by mothers or teachers. No significant group differences were found for total difficulties, conduct problems, emotional symptoms, or peer problems [10]. Similarly, in a separate sample of 27 embryo-donation families with children in middle childhood, no significant adverse group differences were found as compared with various other means of ART conception for parent reports of conduct problems, or attention deficit hyperactivity disorder, oppositional defiant, depressive, or anxious symptoms, somatic complaints, peer problems, prosocial behavior, or neurodevelopmental disorders such as autism spectrum disorder [11]. The UK embryo-donation children also did not have elevated levels of psychological problems in comparison to British norms [11].

While the research is limited and has significant limitations in terms of sample size, homogenous demographics, and other variables, the findings to date suggest that embryo donation, like other forms of ART, does not have a significant negative effect on the psychosocial functioning of the resulting child. However, no research to date explores whether difficulties arise when the children reach adolescence, with its age-appropriate focus on identity formation, or considers the perceptions in adulthood of embryo-donation children on their conception. This research would be necessary prior to a complete understanding of the psychological impact of embryo donation on the offspring.

Parenting the Donor Embryo Child

The lack of adverse outcomes on the psychological functioning of the resulting child could, in part, result from the positive parenting of couples choosing this method of family building. Research concerning the impact of ART generally on parenting has found few, and generally non-adverse, distinctions [8, 9, 12]. As is the case in all areas of psychological issues in embryo donation, very few research studies consider the implications on parenting of children conceived via embryo donation. However, these studies also find no significant negative distinctions in terms of parenting.

Embryo-donation mothers and fathers scored above average in terms of expressed warmth, mother's sensitive responding, and parent–child interactions during their child's preschool years in the same study of 21 British donor embryo families of children aged 2–5 [3]. There were no significant differences in these variables for either mothers or fathers between the three groups (embryo donation, IVF, and adoption), and all three groups were above average on the measures. At middle childhood, there were no significant differences in mother's warmth measured in terms of enjoyment in play, enjoyment in motherhood, expressed warmth, and sensitive responding between the groups and all groups had high mean score [10].

The sole distinction in child-rearing found was parental over-involvement. Embryo-donation mothers were more emotionally over-involved than adoptive, but not IVF, mothers in both the preschool and middle childhood years [3, 10]. Embryo-donation fathers were also more emotionally over-involved than both adoptive and IVF fathers in preschool years [3]. However, it is unclear whether this over-involvement will lead to difficulties for the children. The levels of over-involvement for both embryo-donation mothers and fathers were moderate. The measurement of over-involvement included factors that are not inherently negative, including level of child focus in family life, level of protectedness or concern regarding the child, and whether the parents had interests or activities separate from the child. In addition, the child-centered family life of embryo-donation families may not result in an overall negative parenting experience for the child. In the middle childhood years, the embryo-donation parents were not significantly different in terms of supervision while the children were playing outdoors and while chaperoned [10].

They were also not significantly different in their disciplinary interactions viewed by ease of bedtime, frequency of disputes, and level of battle [10]. In both studies, embryo-donation mothers were the oldest and the couples had been trying for a child the longest [3, 10]. This level of over-involvement may simply reflect that "having had such difficulty conceiving, the embryo-donation parents simply wanted to spend as much time with their children as possible" [3, p. 285]. Given that these parents are the oldest, the parents may also recognize that this parenting phase of life is short-lived and not indefinite. However, the increased emotional over-involvement and secrecy (discussed below) could have a negative impact as the children reach the adolescent tasks of developing autonomy and self-identity [10], and additional research is needed to address the impact of these parenting factors.

Embryo-donation mothers also had higher levels of defensive responding than both adoptive and IVF mothers, as did embryo-donation fathers in comparison to adoptive, but not IVF, fathers [3]. Defensive responding was related to the parent's willingness to answer questions and report or admit difficulties. However, defensive responding may simply reflect recognition of increased social stigma surrounding conception via embryo donation, lack of social permission to complain or feel frustrated, or a social desirability bias [3]. Therefore, it is not clear that the higher levels of defensiveness impacted the research findings or will have any significant impact on the children.

The use of donated embryos also does not appear to negatively impact the psychological adjustment or marital relationship of the couple. No significant differences between couples who built their family via embryo donation versus IVF or adoption were found in terms of quality of marital relationships in the preschool and middle childhood years [3, 10]. Similarly, the three groups did not differ on psychological adjustment as measured through marital stress, trait anxiety, and depression at either of these time points [3, 10]. Therefore, the limited research to date would suggest that the embryo-donation families are generally functioning well.

Secrecy and Disclosure of Embryo-Donation Status

One area where families created through embryo donation may differ from families created through other family-building options is in terms of secrecy and nondisclosure of embryo-donation status. As a practical matter, couples may believe that they will be able to maintain secrecy concerning the use of donated embryos from family, friends, and the child due to the existence of a pregnancy. Even in countries where information concerning the donor couple is maintained for the resulting child, the couple may choose to not disclose his or her origins to the child [5], and the child may not know to request information [2]. However, given the realities of modern genetic testing and social information sharing, it may not be realistic for recipient couples to assume that secrecy can be maintained throughout the child's life.

There is a growing trend toward greater openness in most forms of gamete donation, with donor programs increasingly offering the option of non-anonymous donation and mental health professionals advocating in the literature for disclose to offspring [13]. Currently, the limited research on the issue suggests that embryo-donation parents are less likely to disclose information concerning conception and genetic origin to their child than parents of adoptive or IVF children [3, 10, 14, 15]. In the sample of British families used in several related research studies, only one-third of the embryo-donation couples had told, or were planning to tell, the child about his or her origins, in contrast to 100 % of the adoption couples and 93 % of the IVF couples. Almost 43 % of the embryo-donation parents were not planning on disclosing to the child [3]. Interestingly, 72 % had disclosed to other family members—most often the maternal grandmother—raising the possibility of inadvertent disclosure [14]. At follow-up when the children were in middle childhood, an even greater number (47 %) planned not to disclose. In addition, the four families that declined to participate in the follow-up research had planned on not disclosing. All of the adoption parents had disclosed

at follow-up, and 89 % of the IVF parents had or were planning to disclose [10]. Similarly, embryo-donation parents were significantly less likely to permit teacher contact for research purposes than adopted or IVF parents of middle childhood children [10]. A relatively low level of disclosure in spite of being given counseling concerning the advantages of disclosure was also found in a Finnish sample. The higher rate of belief in disclosure (69 %) compared to the British sample was tempered by the fact that the disclosure for some respondents was hypothetical given that they had not yet conceived, not all disclosures had occurred in those with offspring, and the higher rate did not extend to the child receiving identifying information concerning the donor couple (29 %) [2].

Given the perception of an ability to conceal the nonfamilial genetic origins of the child, the prevalence of disclosure by embryo-donation parents may more closely parallel that of parents who conceive with the help of an egg or sperm donor. However, while embryo-donation families appear similar in attitudes to samples of similar families using other forms of gamete donation [14], current research concerning embryo donation does not reflect the apparent increasing trend toward disclosure found in those other families [3, 14, 16].

The amount of information the couple has regarding the donor couple appears to impact their willingness to disclose to the offspring [15]. Only anonymous embryo donation was available to the British samples. However, the Finnish sample had the option of obtaining embryos from a donor couple who had registered identifying information [2]. If parents are unable to give more information about the donor, they may not disclose the use at all [14]. However, this may also reflect a self-selection with intended parents who wish to disclose seeking more information regarding the donor couple [15].

The most popular reasons for nondisclosure involved a desire to protect the child and to avoid damaging the family relationship, particularly the parent–child relationship [3, 14]. Nondisclosing mothers feared that the lack of genetic connectedness as well as the lack of available genetic information would upset the child [14]. Denial of the importance of the genetic origins of the conception via a singular focus on social and gestational contributions to parenting was also present. Many of the British embryo-donation couples (43 %) reported that there was no need to disclose due to the viewpoint that lack of genetic connection was irrelevant in light of the gestational and social parenting of the child [3, 14]. In contrast to parents via adoption, embryo-donation mothers and fathers report never or rarely thinking about the donor and not discussing the donor with each other [15].

Reasons given for disclosing to the child included desire to avoid unintended disclosure, especially among mothers who had disclosed to family members [3, 14]. A belief that the child had a right to know was another, albeit less common, reason for disclosure [3, 14]. This reasoning involved the importance of the information for future medical needs as well as the child's right to honesty from the parent [14]. The absence of a reason to withhold the information was also cited by almost one-third of the embryo-donation parents [3, 14].

The decision whether to disclose the use of a donated embryo to family members involved similar reasoning as disclosure to the child. Nondisclosure protected the child from rejection by the family and avoided disapproval of the choice by family [14]. In some cases, it was also seen as protective of the male partner and an intensely private matter [14]. In contrast, disclosure was based on the generally high level of communication with the family members, the wish to avoid inadvertent disclosure, and the view that there was no reason to hide the information [14]. Disclosure to relatives in one instance was also seen as supportive of future disclosure to the child [14].

It is also important to understand that disclosure may be partial, such as disclosure of the use of assisted reproduction but not of the lack of genetic relatedness, rather than complete [16, 17]. Even among mothers who plan to disclose, the nongenetic origins may not have been disclosed by middle childhood due to the perceived difficulty explaining the conception [16].

In contrast, disclosure in adoption tended to include a discussion with the child concerning the separation between his or her genetic background and social parenthood [16]. The difficulty determining how and when to disclose [2] and lack of materials to aid in the disclosure may also affect the rates of disclosure [14, 16]. In addition, even in situations where the parents intend to fully disclose the use of donor embryos, they may decide to make the disclosure over time consistent with the child's developmental level [16]. Additional research is needed to determine which approach—early disclosure of basic information followed by additional disclosures as the child develops, or waiting to disclose until the child has reached a developmental ability to understand all aspects of embryo donation—leads to better outcomes for child and family.

While the British sample is functioning well in spite of the fact that most parents have not disclosed the lack of a genetic link to their child, it is unclear what this lack of disclosure may mean in the future for children conceived via embryo donation. Given the reality of modern genetic and social information sharing, it may be unrealistic to assume that secrecy can be maintained. Inadvertent disclosure could potentially have negative effects on psychological functioning of the child. However, no research to date specifically compares the impact of disclosure, nondisclosure, or inadvertent disclosure on embryo-donation children. It is important that any research be specific to embryo donation given its distinctions from adoption and the possible meanings to the child of the likely existence of a donating couple living with the child's full siblings.

Life After Donation: Impact on Donor Couple and Genetically Related Siblings

Little has been written on the impact of donation to another family on donor couples and their existing families after the donation decision. Minimal research exists regarding experiences of that donation over time. Given the common conceptualization of embryos as potential children and siblings, and the sense of responsibility and concern about future parenting many donating couples feel [18–20], research exploring donor couples' conceptualization and experience of their donation over time is critical. Regardless of future contact, the embryo is often "cognitively incorporated into family structure" [19, p. 107]. It may be important for both donor and recipient couples to integrate the perspectives of all the individuals involved in the donation, including extended families, in a future-oriented focus involving an adult child and genetic siblings [21].

Qualitative research involving one small sample of US donors utilizing a Christian "embryo adoption" agency explored the attitudes regarding their "conditional relinquishment" after such disposition was completed [22, 23]. These couples were mainly, but not exclusively, Christian (Catholic or Protestant) and differed in their level of religiosity. Via e-mail the researchers probed for the relinquishment experience and the nature of past, anticipated, and, in a few cases, actual contact with the receiving family. Couples reported rewards and challenges when reviewing their relinquishment experience. The relinquishment experience was often described as sad, bittersweet, and imparting a sense of finality. Additional emotional costs, including feelings of loss, guilt, or, alternatively, relief mixed with guilt, if the donating couple was informed that conception did not occur. Several of the couples experienced negative emotions related to negative developments with the recipient pregnancy such as demise at thawing, failure to achieve a pregnancy, miscarriage, stillbirth, or other negative outcomes. If future research bears out this finding among embryo donors involved with all types of donation programs, possible negative emotions surrounding treatment failures of the recipient couple should be included in psychological counseling of couples donating embryos. Currently, a discussion of the impact of treatment failure and grief is only explicitly included for recipient couples [24].

Two of the more important and little researched challenges for these donor couples involved disengaging emotionally from and creating a comfortable level of communication and relationship

with the recipient couple. Optimum levels of communication varied between couples, and some couples reported a change in their attitudes toward relationship with the recipient couple over time. Ambivalence regarding contact with the resulting child was common, and donors differed concerning whether they preferred contact between the resulting child and their own children. The desire for communication with the recipient couples was also related to anticipated future relationships among the children [22]. This focus on future contact between siblings was also emphasized by some donors in a Finnish study of non-conditional embryo donation, with some donors wanting to be informed of the outcome of the donation in order to prepare for the existence of a donor sibling [2].

The evolving nature of the "embryo adoption" experience for donors and the need for future research to examine long-term implications were highlighted by the researchers [22, 23]. Additional research concerning the implications of donation for donating couples should involve quantitative research of donors choosing non-conditional "embryo donation" as well as conditional "embryo adoption" programs at various times after donation.

Conclusion

Practitioners can have some assurance that embryo donation does not have a detrimental impact on recipient couples or offspring through middle childhood based on limited research. However, additional research is needed. Factors such as disclosure status and method of disclosure are important variables to consider in determining outcomes for offspring, donors, and recipient parents. Additional research concerning the long-term implications of such donation on donating couples is also lacking and necessary to fully counsel such couples prior to disposition. While existing limited research comparing embryo donation, adoption, and other forms of ART is a beginning, more research specific to embryo-donation children and families is required to fully understand the psychological impact of this unique family-building option.

References

1. Machin L. A hierarchy of needs? Embryo donation, in vitro fertilisation and the provision of infertility counselling. Patient Educ Couns. 2011;85:264–8.
2. Söderström-Anttila V, Foudila T, Ripatti UR, Siegberg R. Embryo donation: outcome and attitudes among embryo donors and recipients. Hum Reprod. 2001; 16(6):1120–8.
3. MacCallum F, Golombok S, Brinsden P. Parenting and child development in families with a child conceived through embryo donation. J Fam Psychol. 2007;21(2):278–87.
4. Ethics Committee of the American Society for Reproductive Medicine. American society for reproductive medicine: defining embryo donation. Fertil Steril. 2009;92(6):1818–9.
5. Applegarth LD. Embryo donation: counseling donors and recipients. In: Covington S, Hammer Burns L, editors. Infertility counseling: a comprehensive handbook for clinicians. 2nd ed. Cambridge: Cambridge University Press; 2006. p. 356–69.
6. Goedeke S, Payne D. Embryo donation in New Zealand: a pilot study. Hum Reprod. 2009;24(8):1939–45.
7. Widdows H, MacCallum F. Disparities in parenting criteria: an exploration of the issues, focusing on adoption and embryo donation. J Med Ethics. 2002; 28(3):139–42.
8. Colpin H. Parenting and psychological development of IVF children; review of the research literature. Dev Rev. 2002;22:644–73.
9. Gibson F, McMahon C. Parenting and child psychosocial development after infertility management. Int Congr Ser. 2004;1266:351–8.
10. MacCallum F, Keeley S. Embryo donation families: a follow-up in middle childhood. J Fam Psychol. 2008; 22(6):799–808.
11. Shelton KH, Boivin J, Hay D, van den Bree MBM, Rice FJ, Harold GT, et al. Examining differences in psychological adjustment problems among children conceived by assisted reproductive technologies. Int J Behav Dev. 2009;33(5):385–92.
12. Sutcliffe AG, Ludwig M. Outcome of assisted reproduction. Lancet. 2007;370:351–9.
13. Greenfeld DA. The impact of disclosure on donor gamete participants: donors, intended parents and offspring. Curr Opin Obstet Gynecol. 2008;20(3): 265–8.
14. MacCallum F, Golombok S. Embryo donation families: mothers' decisions regarding disclosure of donor conception. Hum Reprod. 2007;22(11):2888–95.
15. MacCallum F. Embryo donation parents' attitudes towards donors: comparison with adoption. Hum Reprod. 2009;24(3):517–23.
16. MacCallum F, Keeley S. Disclosure patterns of embryo donation mothers compared with adoption and IVF. Reprod Biomed Online. 2012;24(7):745–8.
17. Readings J, Blake L, Casey P, Jadva V, Golombok S. Secrecy, disclosure and everything in-between: decisions of parents of children conceived by donor

insemination, egg donation and surrogacy. Reprod Biomed Online. 2011;22:485–95.
18. Kirkman M. Egg and embryo donation and the meaning of motherhood. Women Health. 2003;38(2):1–18.
19. de Lacey S. Patients' attitudes to their embryos and their destiny: social conditioning? Best Pract Res Clin Obstet Gynaecol. 2007;21(1):101–12.
20. McMahon CA, Saunders DM. Attitudes of couples with stored frozen embryos toward conditional embryo donation. Fertil Steril. 2009;91(1):140–7.
21. Goedeke S, Payne D. A qualitative study of New Zealand fertility counsellors' roles and practices regarding embryo donation. Hum Reprod. 2010; 25(11):2821–8.
22. Frith L, Blyth E, Paul MS, Berger R. Conditional embryo relinquishment: choosing to relinquish embryos for family-building through a Christian embryo 'adoption' programme. Hum Reprod. 2011;26(12):3327–38.
23. Paul MS, Berger R, Blyth E, Frith L. Relinquishing frozen embryos for conception by infertile couples. Fam Syst Health. 2010;28(3):258–73.
24. Practice Committee of the American Society for Reproductive Medicine and Practice Committee of the Society for Assisted Reproductive Technology. Recommendations for gamete and embryo donation; a committee opinion. Fertil Steril. 2013;99(1): 47–62.

Embryo Donation: Ethical Issues

12

Stephanie O. Corley and Jessica Wilen Berg

Introduction

With the ability to cryopreserve embryos[1] come novel ethical and legal questions [1]. Should such embryos be considered persons or property or something in between? Who controls what happens to the embryos? What is the range of options for disposition? Because the assisted reproductive technology (ART) industry is largely self-regulated, very few binding legal or ethical parameters exist. The American Society for Reproductive Medicine (ASRM) proposed ethical guidelines for embryo donation, but these are voluntary[2] [2]. At present, the greatest constraint on embryo creation and cryopreservation is the ability to pay for ART services [3]. Yet, even when individuals abandon their embryos by failing to pay storage fees, clinics are reluctant to discard them for fear of the liability that could result if the couple returns [1]. As a result, after approximately 30 years of artificially creating and cryopreserving embryos, there are hundreds of thousands of embryos frozen in storage [4–7]. This chapter discusses the ethical issues surrounding the disposition of cryopreserved embryos, as well as long-term embryo storage, embryo "adoption," human embryonic stem cell (hESC) research, and the impact on future born children, including commercialization and characterisitic selection.

Background

Cryopreservation is used because it is viewed as a medical, economical, and ethical benefit to ART patients and society. In order to maximize chances of pregnancy [6], multiple eggs are extracted and fertilized in order to produce embryos suitable for implantation. Unused fresh embryos are frozen to enable women to avoid repeat egg extraction if they undergo

[1] The formal definition of an "embryo" is "the developing human organism from approximately 14 days after fertilization of the egg by the sperm until the period when organs and organ systems begin to develop, at approximately the end of the second month" [1, p7]. Some people use the term "preembryo" to refer to the organism before 14 days (when it is technically a zygote). Others use the term "embryo" to cover the entire period of time after fertilization.

S.O. Corley, J.D. (✉)
Dean Lindsey Cowen Research Fellow,
Case Western Reserve University School of Law,
11075 East Boulevard, Cleveland, OH 44106, USA
e-mail: stephanie.corley@case.edu

J.W. Berg, J.D., M.P.H.
Case Western Reserve University School of Law,
11075 E. Boulevard, Cleveland, OH 44106, USA
e-mail: jessica.berg@case.edu

[2] The Society for Assisted Reproductive Technology (SART) and ASRM adopted the 2012 Recommendations. For brevity, this chapter will only refer to ASRM, even if both ASRM and SART adopted guidelines.

J.M. Goldfarb (ed.), *Third-Party Reproduction: A Comprehensive Guide*,
DOI 10.1007/978-1-4614-7169-1_12,

multiple in vitro fertilization (IVF) cycles [8]. Offering this service may discourage the transfer back of multiple embryos in any one cycle because "spares" are readily available [7, 8]. This is beneficial because multiple-gestation pregnancies [7] can create serious risks for the mother, fetus, and newborn [9]. In addition, IVF is costly, and creating multiple embryos to freeze in an initial cycle can be cost effective [7]. Moreover, some prefer to freeze embryos because they feel it better respects the sanctity of life, as opposed to simply discarding spare embryos [7]. Finally, the practice of freezing embryos creates surplus embryos, which may be donated to another couple for reproduction or to investigators for research [6, 8].

In general, progenitors[3] retain decision-making authority regarding the disposition of embryos created from their gametes. In situations in which third-party egg or sperm donors are used to create an embryo for another couple or individual, that couple (or individual) may have control over disposition. But a variety of problems arise when there are disagreements between the relevant parties or when legal relationships between the parties (e.g., marriage or partnerships) dissolve before embryo disposition [1]. ART clinics try to avoid control battles by entering into contracts at the outset of services [1, 8]. However, courts do not always uphold these agreements, particularly when one party is objecting to the use of an embryo for reproductive purposes [1, 10]. ASRM recommends that disposition options be discussed before cryopreservation and, once again, when the progenitors have completed their personal reproductive attempts [2]. Studies consistently show that some people have a change of heart between the time of freezing embryos and the time the final disposition decision is made [11]. Most programs follow a re-consent practice at the time of disposal or transfer [12].

[3] Progenitors include the sperm and egg donor.

Embryo Disposition Options

In the US, very few laws regulating embryo disposition exist [1, 10]. The first priority is given to the couple for use in their own ART efforts. A fair amount of embryos remain frozen as couples decide whether to have more children [6]. Thereafter, the disposition choices include (1) discarding the embryos, (2) freezing them indefinitely, (3) donating the embryos to others to achieve pregnancy, or (4) donating the embryos to science [1, 6]. Some couples seek to transfer back their embryos during an infertile time period—hoping to avoid a pregnancy, but not wanting simply to discard remaining embryos [6]. Multiple disposition options have not made the choice easier for many donors. According to surveys and studies, disposition decisions are complex and difficult [1, 6, 11, 13]. In 2008, a US multi-institutional survey (Lyerly Survey) was conducted to describe fertility patients' disposition preferences for frozen embryos [6]. Of the 500 respondents not desiring future childbearing, 40 % had not elected a disposition option. Seventy percent of respondents delayed their disposition decision for 5 years or more. For many, IVF is the last step in a long battle with infertility [14]. At the time of cryopreservation, couples are focused on conceiving and may not be fully ready to consider embryo disposition [6, 13]. Many couples are emotionally, physically, and financially depleted [14]. This may account for why some progenitors change their minds as to disposition [11] or struggle with the disposition choice in the first place.

Clinics are permitted to create their own guidelines for discarding embryos, and most clinics are willing to discard embryos at their clients' request [1]. But only a small percentage of progenitors elect to discard their cryopreserved embryos [6, 13]. It should be noted that some clinics will only store embryos for a set period of time. In *Litowitz v. Litowitz*, a court held that an informed consent form, signed by the progenitors, that stated that the embryos would be destroyed after 5 years was valid and could be enforced [1, 15].

Complications arise when individuals "abandon" their embryos by failing to pay storage fees [1]. Clinics may be unable to reach the individuals to discuss disposition options. ASRM suggests that clinics should feel free to dispose of embryos after the passage of time reasonably suggests "abandonment," if no written disposition directive exists [16]. Five years is considered a "reasonable" time, if diligent efforts have been made to contact the responsible individuals [16]. Nevertheless, some fertility clinics are reluctant to destroy embryos, even those that have been abandoned [1, 17]. The result is that cryobanks may increase storage fees to offset those who do not pay, limiting the storage option for others who find the cost prohibitive [13, 18].

The Lyerly Survey found that of those respondents who do not desire future childbearing, nearly one-fifth indicated they prefer to freeze their embryos indefinitely [6]. Indefinite storage presents ethical and practical questions. If clinics have no storage limits, what happens upon the death of a progenitor? In Florida (and likely other states considering the issue), control goes to the surviving intended parent [19], but few, if any, statutes or policies specify control beyond this point. Should clinics automatically destroy embryos if both progenitors die without leaving instructions? Alternatively, is it acceptable to allow next-of-kin to make a decision about disposition? ASRM recommends that ART clinics include in the informed consent specific storage time limits, as well as disposition policies in the event of death, divorce, nonpayment of storage fees, and loss of contact [20]. However, ASRM does not recommend any substantive policies and leaves it to clinics to specify details.

In the UK, by contrast, there is a 10-year storage limit on gametes and embryos [21]. However, the law permits an extended storage period if the donor or recipient is or may be prematurely infertile. HFEA requires a registered medical practitioner's opinion verifying that the patient is prematurely infertile or likely to become so. During the extended storage period, the medical practitioner must renew the opinion statement every 10 years. The total storage period is limited to a maximum of 55 years. If the US was to adopt a similar system, time limits might be based upon the length of time in which the progenitors could use the embryos. After that time period, the disposition agreement could be implemented. Like in the UK, maximum periods could be used to avoid intergenerational disputes and burdens. Whether to destroy the embryos already in storage or to grandfather those currently stored would be an important ethical, legal, and political decision. Upon the UK's adoption of its storage limits, 3,000 human embryos were destroyed [13, 22].

Embryo Donation for Reproduction

Only a small minority of progenitors with surplus embryos actually donate them to others for reproduction [1, 6, 11]. In the Lyerly Survey, only 7 % of respondents were very likely to choose reproductive donation, and 59 % were very unlikely to choose this option [6]. RESOLVE, a nonprofit organization promoting reproductive health and equal access to all family building options, surveyed Americans ages 18–45; 63 % surveyed were in favor of donating to other couples, but only 18 % undergoing ART through RESOLVE would donate to another couple [11]. In the Lyerly Survey, researchers have found that factors contributing to reluctance include concerns for the embryo or child [11, 13]. It is unimaginable for some to give their kin to another family or for their child to be separated from a genetic sibling [11]. For others, the fear of unknowing incest or consanguinity is a deterrent [1]. Another potential limitation on reproductive donation is access to this service. Not all clinics offer embryo donation [1, 11, 23].

Embryo donors are typically anonymous and not involved in selecting the recipients, unless the donors have chosen to direct their embryos for use to a particular recipient (directed/known donation) [23]. For those who prefer anonymous embryo donation, the reasons are numerous. One reason is privacy of the recipient parent(s). Although ASRM encourages disclosure to a child born through the use of ART [24], some parents prefer not to tell their child or prefer to limit the information shared [25]. Currently, there

is a movement towards non-anonymous gamete donation owing to the belief that children have the right to know their origins and genetic background [24, 26, 27]. There are websites in which ART children can search for siblings and donors [28]. The UK and other countries have moved to a non-anonymous ART system [29, 30]. There is some concern, however, that non-anonymous donation requirements will decrease the availability of willing donors [30].

Embryo "adoption" is a loose hybrid between directed embryo donation and infant adoption. The concept of embryo "adoption" evolved in part from recipients who wanted to donate their embryos for reproduction, but who were uncomfortable with anonymity [31]. In 1997, the concept of donor "adoption" was popularized by a California-based Christian infant adoption agency, Nightlight Christian Adoptions [1, 31]. In anonymous embryo donation, donors consent to relinquishing their rights. Embryo "adoption" gives donors the ability to choose prescreened recipients, who have undergone home visits (and sometimes education and counseling) [31]. It may also provide donors with the opportunity to create an agreement regarding future information exchange and contact [31].

A debate exists over whether embryo donation or embryo "adoption" is the best way to conceptualize reproductive donation. Those opposed to the concept of embryo "adoption" highlight the legal, ethical, and medical conflict, and also the confusion that using the adoption framework creates [32]. ASRM explicitly rejects embryo "adoption" because it believes that the practice is deceptive and results in unethical administrative and legal procedures, as well as unnecessary costs for infertile recipient(s), who need donor embryos to become pregnant [32]. As ASRM notes, adoption is a legal term defined by all 50 US states. Although state laws vary, adoption can only occur once a child exists. Under most US jurisprudence, an embryo is not a child. Thus, it cannot be "adopted" under existing law. In 2009, however, Georgia passed an embryo adoption law [33]. Other states may follow suit.

In contrast, the organizations that support the concept of embryo "adoption" do so from a perspective that life begins at conception [10]. As a result, some fear that legitimizing embryo "adoption" will undermine abortion laws [8]. There are legitimate concerns that if an embryo is considered to be a legal person, other disposition options, such as discarding and donating for research, become unlawful. Moreover, not all frozen embryos are capable of becoming a viable fetus. In fact, about "35 % of frozen embryos do not survive the freeze/thaw process," and only about 25 % of those that survive make it to the 5-day stage [1]. However, a new freezing process, vitrification, is increasing the percentage of embryos that survive the cryopreservation process [34]. How should we view embryos, given the uncertain viability? Should they all be given the chance for implantation? Should embryos that do not survive be given death certificates? If a clinic is negligent and loses or damages the embryos, will the clinic or its clinicians be criminally liable for manslaughter?

There is little legal oversight governing embryo donation or adoption [10], but federal funding has given embryo "adoption" programs a financial boost [1, 35]. Since 2002, HHS has awarded funding to organizations that promote embryo "adoption" for an embryo "adoption" public awareness campaign [1, 10, 35]. HHS has also awarded funding to organizations like RESOLVE that promote embryo donation [10, 35]. In 2012, HHS did not award any new grants, although eight agreements awarded in previous years were continued [35].

Some scholars have noted that embryo "adoption" supporters have "created confusion by causing the public to equate embryo "adoption" with religious or political agendas," creating a "misleading and perhaps even unethical" perception [10]. They suggest that embryo "adoption" advocates change their taxonomy and use "embryo relinquishment" [31] or "embryo transfer for donation" [10] in order to ameliorate the confusion and conflict created by improperly using a legal term. Finally, some argue for a dual

or multi-model approach to reproductive donation to give donors greater reproductive choice [31]. Despite the extensive energy focused on this debate, only a small percentage of embryos are donated for reproductive purposes [1, 6, 11].

Donor and Recipient Limits

There are almost no laws in the US limiting who can become an embryo donor or recipient. ASRM and the Society for Assisted Reproductive Technology (SART) have non-legally binding guidelines, although members must adhere to requirements [36]. One important ASRM recommendation is to exclude physicians and employees of ART clinics from being donors or recipients within that practice [2]. In addition, efforts should be made to avoid overtly discriminatory policies that reinforce invidious practices, such as limitations based on race or national origin. The FDA regulates infectious diseases and precludes the use of gametes from donors who have an infectious disease or who are screened for high-risk behaviors [37]. However, there is an exception for donors who were sexually intimate partners (SIP) when the embryos were created and cryopreserved [38]. The FDA only recommends that, when possible, SIP donors of cryopreserved embryos be screened and tested for infectious disease [38]. If the embryo donors are not tested and screened, the embryos must be clearly labeled as such [38]. There are also a handful of state laws that place limits on donors. New York restricts donors from creating embryos if their sexual contact would constitute incest under state law [39]. In Oklahoma, both donors and recipients must be married, and the physician must obtain written consent from all parties [10, 40].

ASRM recommends that embryo donors and recipients undergo medical and psychological counseling [2]. It suggests that embryo donors be screened for heritable psychiatric disorders, excessive stress, marital instability, impaired cognitive functioning, and incompetence, among others, and recipients be screened for significant psychiatric illness, current substance abuse, or an inability to cope with the stress of ART. ASRM includes a list of minimum genetic screening for gamete and embryo donors. Donor age guidelines, which are discussed in more detail below, are also recommended by ASRM. Clinics may create their own prerequisites on embryo donation, including restricting donor age, requiring counseling, and signing documents [10]. Owing to client preferences, some clinics give priority to married couples, which limits access of unmarried individuals and some homosexual couples [41]. Others restrict the age of recipients [10].

ART is being used more and more for age-related infertility [3]. In the US, there are no legal restrictions on embryo donor or recipient age. However, donor age is a factor in the success of ART [42]. ASRM recommends that oocytes be from donors aged 21 through 34 [2, 42]. ASRM's rationale is that typically women 34 and younger "respond favorably to ovulation induction, produce more eggs and high-quality embryos with high implantation, and have subsequent higher pregnancy rates than older women" [42]. ASRM also says that recipients should be informed of pregnancy rates and cytogenetic risks (e.g., Down syndrome) if the donor is older than age 34 [2]. ASRM recommends that sperm donors be under 40 [2] to "minimize the potential hazards of aging" [42].

Regarding recipient age, ASRM recommends that embryo recipients over age 45 undergo thorough medical evaluation [2, 42]. Pregnant women over age 35 face increased risks and lower chances of a successful pregnancy [3]. Bioethicists Art Caplan and Pasquale Patrizio argue that there should be an age cut-off for women trying to conceive using ART [3]. In the UK, recipients of donor oocytes cannot be older than 45 [3]. The HFEA restriction is based upon the best interest of the child. In the US and some other countries, there is no official reproductive age limit. If recipients have enough money, they can likely find a doctor or clinic to perform ART (although some clinics state age restrictions). Whether a government-imposed restriction on maternal age and ART is needed is not yet clear. The number of postmenopausal women using ART has been relatively small, although it is increasing [3, 43].

Research Donation

Research donation includes research related to infertility techniques, training for embryologists, and the hotly contested use of embryos for human embryonic stem cell (hESC) research [1, 44]. Because embryos must be destroyed to derive stem cells, it raises issues about the moral status of embryos [44]. In general, the views of embryo donors align with the general public's perception of hESC. Poll results show that the majority of Americans favor stem cell research [44], and surveys consistently show that between donation for reproduction and donation for research, donation for research is the most popular choice [6, 11].

There are both federal and state laws that apply in the embryo research and stem cell areas [1, 44]. Federal funding is allowed for embryo research, but there is no funding for hESCs derived from embryos created specifically for research purposes [1]. A number of states ban embryo research within their borders. Approximately one-fifth of US states ban embryonic stem cell research and another one-fifth have detailed restrictions on stem cell research [1]. In Kentucky and Louisiana, embryos cannot be intentionally destroyed under any circumstances [1]. However, in Kentucky, this only applies to activities at public facilities [1]. Stem cell research is unlawful in Louisiana [1]. Even pro-hESC research states set some limits. For example, Massachusetts and California ban payment to egg donors for research [44].

For those who support embryo donation for research, much of the focus is on ensuring an adequate informed consent process. Some suggest that ART clinics use an unbiased counselor to guard against undue influence or perceived physician pressure [13, 44]. However, donors may expect their ART physicians to explain all the options surrounding embryo disposition [13]. Creating separate standards for research donation versus other disposition options may lead to a variety of problems. Ideally, ART physicians and staff would be permitted to have an initial conversation with their patients, and if research donation is indicated, an unbiased counselor may step in to discuss specific details and gain a fully informed consent in compliance with the federal or state regulatory requirements. This is likely to help strike an appropriate balance between the progenitors' needs and research consent requirements.

Ethical Concerns About the Impact of Embryo Donation on Children: Commercialization and Designing Children

In addition to the specific issues related to embryo donation discussed in the preceding section, there are general concerns about the practice of creating and donating embryos for-profit and the potential to commodify resulting born children. These concerns tend to focus on the increasing commercialization of the ART process and efforts to design or choose embryos with specific characteristics.

An embryo market barely exists [45]. The Abraham Center of Life of San Antonio, Texas, became the first commercial dealer to make embryos in advance for unspecific recipients [45, 46]. It produced "batches of ready-made embryos that single women and infertile couples [could] order after reviewing detailed information about the race, education, appearance, personality and other characteristics of the egg and sperm donors" [46]. The Center received backlash from ethicists, who decried the Center for making "designer babies" and commodifying children [46]. In 2008, the Center stopped selling embryos [45, 47]. At present, at least one US fertility clinic offers discount IVF to infertile couples "by creating a single batch of embryos from one egg donor and one sperm donor, then divvying it up among several patients" [48]. The clinic, not the progenitors, controls the embryos. Some view this as commodification of children [48].

Nonetheless, money does change hands in embryo donation. ART clinics and embryo "adoption" agencies may be paid money for the use of their services [49]. Donors are typically reimbursed for the cost of legitimate fees, such as screening and testing, as well as transferring and thawing costs [50]. ASRM states that selling embryos is per se unethical [2]. ASRM also permits clinics to charge for fees and gives discretion regarding who pays for recommended

testing. ABA's Model Act permits reasonable compensation to donors if an agreement is negotiated in good faith [51]. Florida explicitly permits reasonable reimbursement for costs in embryo donation [19]. Indiana criminalizes the sale of embryos, although it also permits reimbursement for expenses [52]. For some, there is no justification for embryo payment. Unlike egg donation, embryo donation does not create any risks for the donor, nor is there any time or effort for which to compensate (since the embryos are already created) [10]. Moreover, even transfer of a "reasonable" amount of money may be unduly influential, resulting in donations in situations where the individuals would have chosen differently but for the monetary incentive. Furthermore, there is concern that the transfer of money in embryo donation will undermine respect for these potential persons, or even be akin to baby selling [10, 46]. This concern is not without merit. Some US clinics sponsor contests or lotteries for free IVF services [53, 54]. These "baby lotteries" have been called exploitative and demeaning to human reproduction [54].

Despite the ethical concerns for embryo commercialization, the Jain Study found a large proportion of infertility patient participants approved of payments to donors [55]. Payment could increase access to cryopreserved embryos [45]. Yet, payment for embryos could also reduce access to embryos, because ART clinics could charge exorbitant fees [10]. Others worry that allowing the sale of embryos could exploit those with less money, who must agree to the sale of extra embryos to fund their own ART use. Right now, most people undergoing IVF are predominantly Caucasian, highly educated, and in the upper socioeconomic strata [55]. Interestingly, in the Jain Study, wealthier households were more likely to agree with selling extra cryopreserved embryos. Even proponents of a largely unregulated ART market call for limits [45]. One embryo market supporter, Martha Ertman, said she does not condone "over-the-top marketization," such as selling embryos on eBay [45].

Linked to concerns about commercialization and the effect on future children are concerns about characteristic selection. Sometimes referred to as "embryo creation," this is the practice of creating "custom-made embryos" by hand-selecting donor characteristics such as height, eye color, education, and academic achievement [10]. Some pick characteristics to avoid a child suffering with a debilitating genetic disease, a practice widely regarded as ethically acceptable. Once an embryo is created, preimplantation genetic diagnosis (PGD) can be performed to determine whether a genetic disease is present. PGD may also be used for gender selection or cosmetic characteristics, which is controversial. Religious scholars and ethicists warn against the slippery slope from PGD to avoid disease to full-scale eugenics practices [10]. Restricting genetic testing and screening, however, could be a violation of an individual's procreative liberty, particularly in the US, where reproductive rights remain strong. Careful thought should be given to the appropriate scope of PGD in embryo donation.

Conclusion

Despite the ethical and legal concerns relating to embryo donation, ART allows thousands of individuals and couples to conceive children who may not have otherwise been born. The use of ART is widely accepted in the US. Balancing the benefits of scientific procreative advancement against the ethical and societal risks is a weighty task. Ethical and legal parameters should be carefully considered, because restricting access will limit reproductive choice. Nevertheless, given the range of possible concerns, the practice should not be completely unregulated. Care should be taken to develop ethical guidelines and legal parameters to ensure safe and just ART practices.

References

1. Daar JF. Reproductive technologies and the law. Newark: LexisNexis/Matthew Bender; 2006. 7, 599–682, 776.
2. Practice Committee of the American Society for Reproductive Medicine; Practice Committee of the Society for Assisted Reproductive Technology. Recommendations for gamete and embryo donation: a committee opinion. Fertil Steril. 2013;99(1):47–62. http://www.asrm.org/uploadedFiles/ASRM_Content/

News_and_Publications/Practice_Guidelines/Guidelines_and_Minimum_Standards/2008_Guidelines_for_gamete(1).pdf.
3. Caplan AL, Patrizio P. Are you ever too old to have a baby? The ethical challenges of older women using infertility services. Semin Reprod Med. 2010;28(4):281–6.
4. Bakalar N. In vitro fertilization, 1974. The New York Times (N.Y. edition). 2011 Mar 22;Sect. D:7.
5. Hoffman DI, Zellman GL, Fair CC, Mayer JF, Zeitz JG, Gibbons WE, et al. Cryopreserved embryos in the United States and their availability for research. Fertil Steril. 2003;79(5):1063–9.
6. Lyerly AD, Steinhauser K, Voils C, Namey E, Alexander C, Bankowski B, et al. Fertility patients' views about frozen embryo disposition: results of a multi-institutional U.S. survey. Fertil Steril. 2010;93(2):499–509.
7. Clark PA. Embryo donation/adoption: medical, legal and ethical perspectives. Internet J Law Healthc Ethics 2009 [cited 2012 Nov 1]; 5(2):[about 12 pages]. doi:10.5580/22df. Available from: http://www.ispub.com/journal/the-internet-journal-of-law-healthcare-and-ethics/volume-5-number-2/embryo-donation-adoption-medical-legal-and-ethical-perspectives.html
8. Kindregan CP, McBrien M. Embryo donation: unresolved legal issues in the transfer of surplus cryopreserved embryos. Villanova Law Rev. 2004;49:169–206.
9. Centers for Disease Control and Prevention [Internet]. Atlanta: Centers for Disease Control and Prevention; [date unknown]. Multiples and assisted reproductive technology—considering elective single embryo transfers; [updated 2012 Jan 27; cited 2012 Nov 1]; [about 2 screens]. Available from: http://www.cdc.gov/art/preparingforart/eset.htm
10. Kindregan CP, McBrien M. Assisted reproductive technology: a lawyer's guide to emerging law and science. 2nd ed. Chicago: American Bar Association; 2011. p. 121–50.
11. Lazendorf S, Ratts V, Keller S, Odem R. Disposition of cryopreserved embryos by infertility patients desiring to discontinue storage. Fertil Steril. 2010;93(2):486–9.
12. Crockin SL, Jones HW. Legal conceptions: the evolving law and policy of assisted reproductive technologies. Baltimore: Johns Hopkins University Press; 2010. 30, 46, 50–52.
13. Nachtigall RD, Mac Dougall K, Lee M, Harrington J, Becker G. What do patients want? Expectations and perceptions of IVF clinic information and support regarding frozen embryo disposition. Fertil Steril. 2010;94(6):2069–72.
14. American Society for Reproductive Medicine. Birmingham: American Society for Reproductive Medicine; c1996-2012. Preparing for IVF: emotional considerations; [cited 2012 Nov 1]; [about 2 screens]. Available from: http://www.asrm.org/detail.aspx?id=1902
15. Litowitz v. Litowitz, 48 P.3d 261, 271 (Wash. 2002).
16. Ethics Committee of the American Society for Reproductive Medicine. Disposition of abandoned embryos. Fertil Steril. 2004;82 Suppl 1:S253.
17. Gurmankin AD, Sisti D, Caplan AL. Embryo disposal practices in IVF clinics in the United States. Politics Life Sci. 2004;22(2):4–8.
18. Brzyski RG, Binkley PA, Pierce JD, Eddy CA. Impact of implementation of an embryo storage fee on embryo disposal activity. Fertil Steril. 2000;74(4):813–5.
19. Fla. Stat. Ann. §§ 742.13(2), 742.14, 742.17(3) (West 2010); Fla. Stat. Ann. § 742.14, *unconstitutional as applied by* T.M.H. v. D.M.T. 79 So. 3d 787 (Fla. Dist. Ct. App 2011).
20. Practice Committee of the American Society for Reproductive Medicine; Practice Committee of the Society for Assisted Reproductive Technology. Elements to be considered in obtaining informed consent for ART. Fertil Steril. 2006;86 Suppl 4:S272–3.
21. Hum Fertilisation & Embryology Auth [Internet]. London: Hum Fertilisation & Embryology Auth; [date unknown]. New arrangements for the storage of gametes & embryos; [updated 2009 Sep 11; cited 2012 Nov 1]; [about 3 screens]. Available from: http://www.hfea.gov.uk/5354.html
22. Edwards RG, Beard HK. Destruction of cryopreserved embryos: UK law dictated the destruction of 3000 cryopreserved embryos. Hum Reprod. 1997;12(1):3–5.
23. Frith L, Blyth E, Paul MS, Berger R. Conditional embryo relinquishment: choosing to relinquish embryos for family-building through a Christian embryo 'adoption' programme. Hum Reprod. 2011;26(12):3327–38.
24. Ethics Committee of the American Society for Reproductive Medicine. Informing offspring of their conception by gamete donation. Fertil Steril. 2004;81(3):527–31.
25. Cahn N. The new kinship. Georget Law J. 2012;100(2):367–429.
26. Ravitsky V. "Knowing where you come from": the rights of donor-conceived individuals and the meaning of genetic relatedness. Minn J Law Sci Technol. 2010;11(2):655–84.
27. Dennison M. Revealing your sources: the case for non-anonymous gamete donation. J Law Health. 2008;21:1–27.
28. Donor Sibling Registry [Internet]. Nederland (CO): Donor Sibling Registry; c2000-12 [cited 2012 Nov 1]. Available from: https://www.donorsiblingregistry.com/
29. Blyth E, Frith L. Donor-conceived people's access to genetic and biographical history: an analysis of provisions in different jurisdictions permitting disclosure of donor identity. Int J Law Policy Fam. 2009;23:174–91.
30. Bernstein G. Regulating reproductive technologies: timing, uncertainty, and donor anonymity. Boston Univ Law Rev. 2010;90(3):1189–219.
31. Blyth E, Frith L, Paul MS, Berger R. Embryo relinquishment for family building: how should it be

conceptualized? Int J Law Policy Fam. 2011; 25(2):260–85.
32. Ethics Committee of the American Society for Reproductive Medicine. American society for reproductive medicine: defining embryo donation. Fertil Steril. 2009;92(6):1818–9.
33. Ga. Code Ann. §§ 19-8-40 to 43 (West 2010).
34. Loutradi KE, Kolibianakis EM, Venetis CA, Papanikolaou EG, Pados G, Bontis I, et al. Cryopreservation of human embryos by vitrification or slow freezing: a systematic review and meta-analysis. Fertil Steril. 2008;90(1):186–93.
35. U.S. Department of Health and Human Services Office of Population Affairs [Internet]. Washington D.C.: U.S. Department of Health & Human Services; [date unknown]. Embryo adoption; [cited 2012 Nov 1]; [about 3 screens]. Available from: http://www.hhs.gov/opa/about-opa-and-initiatives/embryo-adoption/#funding
36. Daar J. Federalizing embryo transfers: taming the wild west of reproductive medicine? Columbia J Gend Law. 2012;23(2):257–325.
37. U.S. Food and Drug Administration [Internet]. Silver Spring (MD): U.S. Food & Drug Administration; [date unknown]. Guidance for industry: eligibility determination for donors of human cells, tissues, and cellular and tissue-based products (HCT/Ps); 2007 Aug [last updated 2012 Apr 19; cited 2012 Nov 1]; [about 5 screens]. Available from: http://www.fda.gov/downloads/BiologicsBloodVaccines/GuidanceComplianceRegulatoryInformation/Guidances/Tissue/ucm091345.pdf
38. Donor Eligibility, 21 C.F.R. Sect. 1271.90 (2012).
39. N.Y. Comp. Codes R. & Regs. tit. 10, § 52-8.7(i) (2012).
40. Okla. Stat. tit. 10, § 556-A.1 (2012).
41. Nightlight [Internet]. [Place unknown]: Nightlight, Inc.; [date unknown]. Snowflakes Embryo Adoption Program. Information for Adopting Parents; [reviewed 2011 Apr 27; cited 2012 Nov 1]; [about 13 pages]. Available from: http://www.nightlight.org/wp-content/uploads/2012/01/Snowflakes-facts.pdf
42. American Society for Reproductive Medicine [Internet]. Birmingham: American Society for Reproductive Medicine; c2012 [cited 2012 Nov 1]. Third-party reproduction (sperm, egg, and embryo donation and surrogacy): a guide for patients revised 2012; [about 20 pages]. Available from: http://www.asrm.org/uploadedFiles/ASRM_Content/Resources/Patient_Resources/Fact_Sheets_and_Info_Booklets/thirdparty.pdf
43. Fisseha S. A match made in heaven: Posthumous fatherhood and postmenopausal motherhood. Virtual Mentor: Am Med Assoc J Ethics [Internet]. 2007 Sep [cited 2012 Nov 1];9(9):630–634. Available from: http://virtualmentor.ama-assn.org/2007/09/pfor1-709.html
44. Robertson JA. Embryo stem cell research: ten years of controversy. J Law Med Ethics. 2010;38(2):191–203.
45. Ertman M. The upside of baby markets. In: Goodwin MB, editor. Baby markets: money and the new politics of creating families. New York: Cambridge University Press; 2010. p. 23–40.
46. Stein R. 'Embryo bank' stirs ethics fears. The Washington Post [Internet]. 2007 Jan 6 [cited 2012 Nov 1]:[about 2 pages]. Available from: http://www.washingtonpost.com/wp-dyn/content/article/2007/01/05/AR2007010501953.html
47. Eworldwire [Internet]. San Antonio: Eworldwire; c1996-2012 Abraham Center for Life no longer in embryo business; 2007 May 30 [cited 2012 Nov 1]; [about 3 screens]. Available from: http://www.eworldwire.com/pressrelease/17092
48. Zarembo A. Los Angeles Times [internet]. Los Angeles: Los Angeles Times; c2013. An ethics debate over embryos on the cheap. 2012 Nov 19 [cited 2013 May 22]; [about 2 pages]. Available at http://articles.latimes.com/2012/Nov/19/local/la-me-embryo-20121120
49. Nightlight [Internet]. [Place unknown]: Nightlight; [date unknown]. Embryo adoption FAQs; [cited 2012 Nov 1]; [about 2 screens]. Available from: http://www.nightlight.org/faqs/
50. RESOLVE: The National Infertility Association [Internet]. McLean: RESOLVE; [date unknown]. Embryo donation: myths and facts; [cited 2012 Nov 1]; [about 4 screens]. Available from: http://www.resolve.org/family-building-options/donor-options/embryo-donation-myth-and-facts.html
51. Am Bar Ass'n Model Act Governing Assisted Reprod Tech. §§ 102(33), 501, 602–606, 802; art. 7(2008).
52. Ind. Code Ann. § 35-46-5-3(b)-(c)(1) (West 2012).
53. Rochman, B. Time [Internet]. [Place unknown]: Time; [date unknown]. Baby contest: Couples compete for free IVF – is this exploitation or generosity? 2012 June 19 [cited 2012 Nov 1]; [about 3 pages]. Available from: http://healthland.time.com /2012 /06 /19/fertile-ground-couples-compete-for-free-ivf-exploitation-or-generosity/
54. Fiore K. ABC News [Internet]. [Place unknown]: ABC News; [date unknown]. IVF lottery raises eyebrows in UK. 2011 Jul 8 [cited 2012 Nov 1]; [about 3 pages]. Available from: http://abcnews.go.com/Health/ivf-lottery-raises-eyebrows-uk/story?id=14021901
55. Jain T, Missmer SA. Support for selling embryos among fertility patients. Fertil Steril. 2008; 90(3):564–8.

Part IV

Sperm Donation

Donor Insemination

13

Brooke V. Rossi

Introduction

Intrauterine insemination (IUI) is a procedure that utilizes a catheter to place sperm into the uterus. The washing of the sperm and the placement of the sperm in the upper genital tract introduce a greater number of viable and motile sperm closer to the site of fertilization. Donor insemination (DI), also referred to as therapeutic donor insemination, or TDI, uses sperm from a man with whom the woman is not in an intimate relationship. Donor sperm can be from someone the woman does not know (anonymous) or a man known to her (directed).

History

Artificial insemination was first attempted in different species of female animals through the 1600s and 1700s [1]. Lazzaro Spallanzani is credited with the first successful insemination, initially in animals. In the late 1700s, the first successful insemination of a woman was reported. In this case, the wife of a man with male infertility related to hypospadias proceeded to have a normal pregnancy after vaginal insemination with his sperm. In 1866, John Marion Sims reported 55 inseminations on six couples, with only one pregnancy, which resulted in a spontaneous abortion.

Although insemination was controversial, Dr. William Pancoast took the procedure one step further and inseminated a woman with sperm that was not her husband's. In 1884, this Quaker couple approached Dr. Pancoast for assistance with conception. The husband was found to have azoospermia. As Dr. Pancoast discussed the couple's case with his medical residents, it was decided that the "best looking" of the residents would donate sperm to be used for insemination. Under the guise of performing an exam, the wife was anesthetized and inseminated. She gave birth 9 months later. The clandestine procedure was disclosed to the husband at the time of the pregnancy, but it was not until 25 years later that she learned of the donor insemination. In 1909, after the death of Dr. Pancoast, a report of this insemination appeared in a medical journal. In this letter, Dr. Addison Davis Hard, one of Pancoast's residents, claimed that this, the first human donor insemination, had been performed at the Jefferson Medical College in Philadelphia in 1884.

Donor insemination continued to be shrouded in ethical, legal, religious, and medical questions. In 1954, the Supreme Court of Cook County stated that regardless of the husband's consent, donor insemination was considered "adultery," and children born from this process were considered

B.V. Rossi, M.D. (✉)
Department of Obstetrics and Gynecology,
Case Western Reserve School of Medicine,
University Hospitals Case Medical Center, 1000
Auburn Dr., Suite 310, Beachwood, OH 44122, USA
e-mail: Brooke.Rossi@UHhospitals.org

J.M. Goldfarb (ed.), *Third-Party Reproduction: A Comprehensive Guide*,
DOI 10.1007/978-1-4614-7169-1_13,

"illegitimate." In 1964, Georgia was the first state to pass a law recognizing children born from donor insemination, if written consent was given by the husband and wife. The Uniform Parentage Act was approved in 1973, stating that if a wife is artificially inseminated with donor semen under a physician's supervision and with her husband's consent, the law treats the husband as if he were the biological father of the donor insemination child. In the subsequent decades, the discipline of donor insemination focused on safety, including infectious disease and genetic screening. Furthermore, there was increasing use of donor insemination in single women and non-infertile women in same-sex relationships.

Polge et al. are credited with the first successful cryopreservation of sperm in 1949, using the cryoprotectant glycerol [2]. In 1953, the first human pregnancy with frozen sperm occurred, but due to the moral and legal controversy surrounding artificial insemination, it was not widely publicized until the 11th International Congress of Genetics in 1963 [3]. These advances allowed the development of commercial sperm cryobanks through the 1970s.

In the early days of DI, fresh semen was simply placed near the cervix to mimic intercourse. The technologies of cryopreservation and sperm washing allowed for intrauterine insemination. Intrauterine insemination has a greater likelihood of pregnancy than intracervical or intravaginal insemination [4]. However, some women may prefer insemination at home to decrease the cost and the invasiveness of intrauterine insemination.

In 1979, University of Wisconsin researchers Curie-Cohen et al. published one of the classic articles on donor insemination [5]. Approximately 400 physicians reported that in addition to treating infertility, 26 % used DI to prevent transmission of a genetic disease and 10 % used DI for single women. Matched phenotypically to the recipient's husband, most of the donors were college students and were inadequately screened for genetic diseases. Donors' identities were protected, and there could be multiple donors for one cycle. The poor follow-up on these donors and resultant pregnancies led to the recognition of critical issues such as genetic screening, consanguineous matings or other effects of multiple donor use, and the need for careful record keeping and more research.

This study did increase the demand of donor insemination. Up to this time, it was thought that fresh sperm was more effective than frozen sperm. However, the discovery of HIV in the 1980s forced the medical community to create a safe practice for donor insemination. Thus, testing men for sexually transmitted infections at the time of donation, cryopreserving and holding the sperm for 6 months, and then retesting to confirm the lack of infection became the standard of care.

As will be subsequently discussed, one of the main indications for donor insemination is male factor infertility. However, a major medical advancement in the treatment of male infertility occurred in1992, as Palermo et al. reported the first births after intracytoplasmic sperm injection (ICSI) [6]. ICSI is a procedure in which one sperm is directly injected into the cytoplasm of an egg. Usually, ICSI is performed in conjunction with controlled ovarian hyperstimulation to obtain numerous eggs. Sperm can be used from an ejaculate and from an epididymal or testicular extraction [7, 8]. Essentially, ICSI allowed many more men with moderate to severe male factor infertility to achieve pregnancy, thus decreasing the need for donor insemination. In 1996, the French CECOS Federation, which monitors 22 French sperm cryopreservation centers, reported a 16 % decrease request for donor sperm, some of which was attributed, in part, to the use of ICSI [9]. Furthermore, after noting a significant decrease in the number of DIs through the 1990s, Schover et al. studied reasons for fewer patients choosing DI [10]. In this population, over 90 % of the men and women who chose ICSI did so because of a desire for a biologically related child, and 60 % of men and women who chose donor insemination did so because they could not afford the cost of ICSI.

Indications for Donor Insemination

Indications for donor insemination include the following:

- Severe male factor infertility, including azoospermia (no sperm), severe oligospermia (very few sperm), or poor motility (movement of sperm).

- Women without a male partner.
- Couples in which one or both of the partners have a heritable disease.
- Couples in whom the husband has a communicable disease.
- Female partner is Rh negative and severely Rh isoimmunized, and the male partner is Rh positive.

Male Factor Infertility

When men have azoospermia, often the treatment of choice is testicular biopsy with ICSI. To perform ICSI, a woman undergoes controlled ovarian stimulation with medication and has an oocyte, or egg, retrieval, similar to what would occur for in vitro fertilization (IVF). The difference between conventional IVF and ICSI is how fertilization occurs. In conventional IVF, each oocyte is incubated with 50–100,000 motile sperm, and the sperm fertilize the oocyte spontaneously. To perform ICSI, a single motile sperm is placed directly into the egg to facilitate fertilization. Thus, very few sperm are needed. However, due to the cost of the ovarian stimulation and the ICSI procedure, some couples may choose to use donor sperm. In addition, ICSI obviously cannot be done if no sperm are found in the testicular biopsy.

Women Without a Male Partner

Women with woman partners or single women may utilize donor sperm to achieve pregnancy. Most often these women do not have infertility and can have inseminations done without the use of any medications.

Couples with Heritable Disease

Couples in which both the man and the woman both carry an autosomal recessive disease or the man carries an autosomal dominant or a sex-linked disease may consider donor insemination to prevent the transmission of disease to their children. Other options include performing IVF with preimplantation genetic diagnosis (PGD) to test embryos for disease and to transfer only normal blastocysts into the uterus and/or chorionic villus sampling to diagnose the condition.

Sero-Discordance for Communicable Disease

Men who have hepatitis or HIV can transmit these diseases to their female partner if she is not a carrier of the disease. Sperm washing combined with intrauterine insemination does seem to greatly decrease the chance of transmission of these diseases to the female, but some couples may choose to use donor sperm.

Contraindications

Intrauterine insemination is contraindicated in women with the absence of a cervix or a very underdeveloped cervix, endometritis, bilateral fallopian tube obstruction, or ovulatory dysfunction that cannot be corrected [11].

Donor Screening

The American Society for Reproductive Medicine recommends the following screening for sperm donors [12]:

- Sperm donors should be 18–40 years old. Increasing male age may be associated with an increase in the prevalence of chromosomally abnormal sperm [13].
- A history of fertility is desired, but not required.
- Employees or clinicians of the office practice cannot be a donor to a patient at that practice.

Genetic Disease Screening

Donors who are carriers for heritable disease need not necessarily be excluded if recipients are not carriers. Among healthy young adults, the chance of having a chromosomal rearrangement that could be transmitted in an unbalanced form to offspring is small. For this reason, routine karyotyping of all donors is optional. Table 13.1

Table 13.1 Minimal genetic screening for sperm donors[a]

Should not have any major Mendelian disorder
Mendelian disorders fall into the following categories:
1. Autosomal dominant or X-linked disorders in which age of onset extends beyond the age of the donor, such as Huntington disease 2. Autosomal recessive inheritance (homozygous)
Should not have (or have had) any major malformation of complex cause (multifactorial/polygenic), such as spina bifida or heart malformation
A major malformation is defined as one that carries serious functional or cosmetic disability
Should not have any significant familial disease with a major genetic component, particularly in their first-degree relatives
Should not carry a known karyotypic abnormality that may result in chromosomally unbalanced gametes
A member of a high-risk group should be tested to determine carrier status for those disorders they are at higher risk of carrying
All gamete donors should be evaluated by the current tests recommended at the time of the donation
Donors should be generally healthy and young Males 40 years and older are at increased risk for new mutations

[a]Adapted from [12]

Table 13.2 Recommended carrier screening based on ethnicity

Eastern European (Ashkenazi) Jewish [14]	Tay-Sachs disease
	Canavan disease
	Cystic fibrosis
	Familial dysautonomia
All races and ethnicities [15]	Cystic fibrosis
African descent [16]	Sickle cell disease
African, Southeast Asian, Mediterranean [16]	Thalassemias

demonstrates the American Society for Reproductive Medicine's recommended genetic screening for sperm donors. In addition, screening guidelines recently developed by the American College of Obstetricians and Gynecologists, which apply to the general population, should be considered in gamete donors as well (Table 13.2).

Infectious Disease Screening

All sperm donors are required, by the Food and Drug Administration (FDA), to undergo communicable disease testing. Table 13.3 demonstrates FDA physical exam and laboratory screening requirements.

Table 13.3 Food and Drug Administration (FDA) screening of donors for communicable disease

Communicable disease	FDA screening required with history and physical exam	FDA screening required with laboratory evaluation
HIV types 1 and 2	X	X
Human T-lymphotropic virus types I and II	X	X
Hepatitis B	X	X
Hepatitis C	X	X
Human transmissible spongiform encephalopathy (TSE), including Creutzfeldt-Jakob	X	
Treponema pallidum	X	X
Communicable diseases associated with xenotransplantation	X	
Chlamydia trachomatis	X	X
Neisseria gonorrhoeae	X	X
West Nile virus	X	
Severe acute respiratory syndrome	X	
Small pox	X	
Sepsis	X	
Cytomegalovirus	X	X

All testing of communicable diseases must be completed for both anonymous and directed donors within 7 days of the donation. The anonymous donor samples are quarantined for 180 days after the date of donation, at which time the donors are then retested for communicable disease. If the testing is negative, the samples are released for use.

Directed Donation

Non-anonymous donation (directed) is requested by some patients. It is recommended that directed donors undergo the same screening and testing as anonymous donors. However, if the known donor tests positive for a risk factor or disease, the FDA does not prohibit use, but the specimen must be labeled and the physician and recipient

Table 13.4 Minimal requirements for sperm donors[a]

Volume	>2 mL
Sperm motility	>50 % moving actively in a purposeful direction
Sperm concentration	Sperm concentration $>50 \times 10^6$ motile sperm/mL
Sperm morphology	Normal range
Cryosurvival	>50 % of initial motility

[a]Reprinted from Fertil Steril, 82/Suppl 1, American Society for Reproductive Medicine, Guidelines for sperm donation, S9-12, Copyright 2004, with permission from Elsevier

must be aware. Furthermore, the FDA does not require quarantine for directed donation. However, the American Society for Reproductive Medicine (ASRM) recommends that directed donors have the same protocols as anonymous donors, that recipients be made aware of any increased risks or presence of disease in the donor, and follow the same quarantine regulations [12].

Semen Characteristics

There are no standards for semen characteristics to qualify to be a sperm donation, but Table 13.4 demonstrates minimal criteria for use [17].

Evaluation of Female Recipient

Routine medical history and physical, including pelvic, examination should be completed. The recipient should undergo preconception counseling and screening. Due to the potential medical and legal issues that may arise if the recipient seroconverts during or after treatment, the ASRM suggests that the recipients of donor sperm undergo communicable disease screening laboratory evaluation prior to insemination [12]. It is also recommended to evaluate fallopian tube patency with hysterosalpingogram (HSG) prior to insemination. However, if she is low risk for tubal disease and is concerned about the cost or pain associated with an HSG, she may choose to decline this test after appropriate counseling.

Performing the Insemination

Laboratory Preparation of the Specimen

Due to the FDA recommendations regarding the quarantine of sperm, samples are likely to be frozen, even in cases of directed sperm donation. Ejaculate processing and sperm washing are necessary to remove the prostatic secretions and seminal fluid, which contain prostaglandins, from the sperm. Without processing, these secretions may cause uterine cramping, vagal reactions, and possibly even anaphylactic reactions. In addition, the washing removes cellular debris and bacteria and concentrates the number of total motile sperm. The sperm processing routinely occurs prior to the freezing of the specimen, at the sperm bank for anonymous donors or the local andrology lab for directed donors.

The two types of sperm processing are the swim-up technique and the density gradient centrifugation. In the swim-up technique, culture media is layered over the semen. Motile sperm swim up into the culture and the layer is removed for use. During density gradient centrifugation, the semen is placed on a density column and centrifuged. The motile, morphologically normal sperm fall into a layer, which can be removed and used for insemination. Boomsma et al. conducted a meta-analysis to assess for differences in outcomes among these different sperm preparation techniques [18]. This meta-analysis did not show evidence of a difference in the effectiveness of a swim-up versus gradient technique on pregnancy rates per couple (OR 1.57, 95 % CI 0.74–3.32) or miscarriage rate (OR 0.13, 95 % CI 0.01–1.33).

Characteristics of the Specimen

What concentration and qualities of the insemination sample are necessary to be effective? Van Voorhis et al. examined 3,479 IUI cycles and found that a total motile sperm count of >10 million sperm in the ejaculate was predictive of pregnancy [19]. If the number of total motile

sperm in the washed sample is considered, Miller et al. determined that the post-wash total motile sperm count was independently associated with pregnancy after IUI [20]. The pregnancy rates were significantly higher, with inseminations of >10 million motile sperm, and couples with >10 million motile sperm were significantly more likely to achieve a pregnancy (pregnancy rate less than 10 million = 1 %, 10–20 million = 7.4 %, >20 million = 12.4 %). However, a retrospective study of 9,663 IUI cycles found that an insemination with <2 million motile sperm was associated with a significantly lower (5 %) likelihood of pregnancy ($P < 0.001$), while a study of 1,115 cycles found a significantly lower pregnancy rate with <1 million motile sperm, but no difference between >1 million and >5 million motile sperm [21, 22]. Although these data do not define a specific number of sperm needed for DI success, it is reasonable to use the standards in Table 13.4.

Procedure

Our andrologists rinse the insemination catheter with media (the same media used to thaw the specimen), and approximately 0.5 mL of the specimen is aspirated with the insemination catheter into a 1-mL syringe. There are several different IUI catheters. Small prospective, randomized studies have found no difference in pregnancy rates between flexible and rigid catheters [23, 24]. Van der Poel et al. performed a meta-analysis to investigate for differences among catheters, specifically soft versus firm IUI catheters [25]. There was no difference in live birth or clinical pregnancy rates among types of catheters.

Proper identification and verification of patient and sample must be performed at the initiation of the IUI. The patient is then placed in dorsal lithotomy position. A bivalve speculum is placed in the vagina and the cervix is identified. A full bladder may facilitate catheter placement in women with an anteverted uterus. A randomized study demonstrated that women with passive straightening of the uterus by oral hydration had a greater incidence of easy IUI compared to those who emptied their bladder immediately prior to IUI (0.86 and 0.57, respectively, and RR for easy IUI was 4.76; 95 % CI 3.00–7.54) [26]. Conversely, a patient with a retroverted uterus may benefit from an empty bladder.

Once the cervical os is visualized, the catheter is placed though the cervix, just through the internal os. If difficulties are encountered navigating the endocervical canal, some strategies to ease passage are to adjust the speculum or to curve the catheter. A tenaculum may be placed on the cervix or a stylet can be used, but these procedures may be uncomfortable for the patient and should be avoided, if possible. A transabdominal ultrasound may also be helpful in directing the catheter into the uterine cavity. Once in the cavity, care should be taken to avoid touching the fundus, as this can be uncomfortable for the patient. The sperm should be injected, and the catheter slowly removed.

Several randomized studies suggest that pregnancy rates may be increased if the woman remains lying down on the examination table for 10–15 min [27]. A prospective, randomized trial of women treated with clomiphene and IUI found that subjects who remained supine for 10 min after insemination had higher per cycle pregnancy rates (4.4 % vs. 13.3 %) and three-cycle cumulative pregnancy rates (10 % vs. 29 %) [28]. Patients can be told that they do not have any restrictions and can return to normal activities after the insemination.

Complications

Serious complications from IUI are infrequent. Few women may report bleeding, cramping, and rarely infection.

Timing and Number of Inseminations

To facilitate conception, sperm should be in the upper genital tract at the time of ovulation. Thus, the IUI is timed to have the sperm meet the oocyte. The time of ovulation can be known by checking ovulation prediction kits or ultrasound and/or blood monitoring. Luteinizing hormone

(LH) levels peak over 24 h and are detected in the blood 36–48 h and in the urine 24 h prior to ovulation. Many patients will choose home urine LH testing (ovulation prediction kits) over blood testing, as this is easier, is less expensive, and avoids repeated blood draws. For women choosing ovulation prediction kits, urine testing should occur every morning, beginning several days prior to expected ovulation. Insemination should be scheduled 24 h after a positive urine LH test. However, women can have a false-positive or false-negative urine LH test, leading to an inappropriately timed insemination and a lower chance of pregnancy.

Alternatively, ultrasound monitoring can monitor ovarian follicular development, during a stimulated or non-stimulated cycle. Ultrasound monitoring may be used when patients have difficulty interpreting ovulation prediction kits or if they have unilateral tubal blockage and it is necessary to confirm follicular growth on the side of the patent tube. When the ovarian follicle size indicates egg maturity, the patient receives an injection of human chorionic gonadotropin (hCG) administration. Insemination should be scheduled 36 h after hCG administration.

A prospective, randomized crossover study compared two methods of timing IUI, urinary LH monitoring and ultrasound/hCG timing of ovulation, in infertility patients receiving clomiphene citrate [29]. The pregnancy rate with LH-timed IUI was 4.29 % (3/70) and that with hCG-induced ovulation was 4.23 % (3/71), which was not a statistically significant difference. A meta-analysis of seven studies with 2,623 subjects found that patients who received hCG before IUI demonstrated lower clinical pregnancy rates than did women who had IUI after spontaneous ovulation (OR 0.74, 95 % CI 0.57–0.961) [30]. There were nonsignificant differences in pregnancy rates among different etiologies of infertility. Similarly, a large meta-analysis of 10 trials of infertility patients showed no significant difference in live birth rate between different timing methods for IUI: hCG versus LH surge (OR 1.0, 95 % CI 0.06–18) [31]. In view of the data indicating no advantage of one form of timing IUI over another, the choice should be based on a patient's individual medical scenario and/or their convenience and cost concerns.

Pregnancy rates are highest when the donor has fewer than 3 days of abstinence before donation [32]. In a study of the effect of ejaculatory abstinence on insemination, three clinically significant abstinence groups were identified: up to 3 days (group 1), 4–10 days (group 2), and >10 days (group 3). There was a statistically significant difference in pregnancy rates among the three groups ($P<0.05$): 14 % versus 10 % versus 3 %. This may not be applicable to anonymous donors, but it may be a helpful instruction for directed donation sperm collection.

The timing of the IUI and the frequency of IUI have been studied. One of the more controversial topics is the possible difference in effectiveness of one versus two inseminations per cycle. Tonguc et al. randomized women receiving ovarian stimulation with gonadotropins into three different IUI (non-donor) timing groups: a single IUI performed 24 h after hCG administration, two IUIs performed 12 and 36 h after hCG, and a single IUI performed 36 h after hCG administration [33]. There was no difference in the pregnancy rates among these three groups, suggesting minimal benefit compared to the increased cost to the patient for the additional IUI. However, there are no randomized trials using DI. An observational study of 99 women compared one- versus two-donor IUI per cycle [34]. Subjects who had one IUI had a monthly fecundability (chance of pregnancy) of 0.06, and those with two consecutive IUIs had a fecundability of 0.21. Similarly, another study demonstrated a higher pregnancy rate per cycle (5 % vs. 17.9 %, $P<0.0002$) with one- versus two-donor IUI [35]. Although this was an observational study done more than 20 years ago, one may want to consider two inseminations in selected situations.

Medical Stimulation Protocols

Depending on the clinical situation, women may proceed with unstimulated (natural) cycle IUI or a stimulated cycle with clomiphene

citrate plus IUI or gonadotropins plus IUI. Clomiphene citrate or gonadotropins can be used for supraovulation to treat infertility. For women who have regular periods and no history of infertility, natural cycle IUI is reasonable and avoids the risk of multiple gestations that exists with ovarian stimulation. The use of clomiphene citrate and, even more so, gonadotropins increases the incidence of multiple gestations. Thus, stimulated cycles should only be used if the woman has infertility, or they may be considered if the woman has not achieved pregnancy in 3–6 cycles.

Outcomes

Cycle Outcomes

Assuming that a woman requesting DI has no history of infertility, her pregnancy rate with DI is influenced by her age. Shenfield et al. evaluated the effects of age on pregnancy rates using cryopreserved donor sperm [36]. The cumulative conception rates after 3, 6, and 12 cycles of treatment were 21 %, 40 %, and 62 % for patients <30 years of age compared with 17 %, 26 %, and 44 % for those aged ≥30 years ($P=0.008$).

Several studies have evaluated success of donor IUI in single women or in women in same-sex relationships. In order to determine the influence of patient's age, ovarian stimulation, and number of treatment cycles on the cycle fecundity and cumulative pregnancy rate of women undergoing donor insemination, Ferrara et al. retrospectively reviewed 1,056 DI cycles in 261 women [37]. There was a statistically significant difference ($P=0.0002$) between the mean age of the patients who became pregnant (35.6 ± 4.5 years) and those who did not (37.8 ± 4.4 years). The cumulative pregnancy rate after eight cycles for women ≤34 years was 86 % compared with 51 % and 32 % in women 35–40 and >40 years old. The pregnancy rate was 13 % in spontaneous cycles, 7.2 % with clomiphene citrate, and 11.2 % in human menopausal gonadotropin cycles (not significant). The cumulative probability of pregnancy showed no differences among types of ovarian stimulation. The effect of age was illustrated in another study that evaluated the pregnancy rates of 675 cycles of same-sex couples or single women using donor sperm [38]. The cumulative pregnancy rate was significantly lower in single women (43/122, 35 %) than in same-sex couples (women) (20/35, 57 %; $P=0.02$), but the age of the same-sex couples (women) was significantly younger (34.5 years) than the single women (38.5 years).

Clearly, some women who undergo donor insemination may have compromised fertility. For this reason, a basic fertility evaluation should be done before embarking on donor insemination. If the woman does not conceive in 3–6 cycles, a more extensive evaluation and/or more aggressive intervention should be considered.

Offspring Outcomes

There are several large studies that describe pregnancy outcomes of donor IUI cycles. Hoy et al. compared 1,552 donor insemination pregnancies to 7,717 spontaneously conceived pregnancies [39]. There were no differences in the incidence of preterm birth, low birth rate, perinatal death, or birth defects. Of note, ovulation induction, only used in women with irregular cycles, not for superovulation, was used in 23.8 % of the DI cycles and was associated with a sixfold significant increase in the incidence of multiple births compared with donor insemination pregnancies conceived without ovulation induction (RR = 6.0, 95 % CI 3.4–10.7). One of the largest studies of IUI using frozen donor sperm was conducted by the French CECOS Federation and included 21,597 pregnancy cycles [40]. This study reported an 18 % spontaneous abortion rate and a 0.9 % ectopic pregnancy rate. Of the 8,943 singletons, 4.7 % were less than 2,500 g at birth, 4.8 % were premature, and 1 % had a fetal demise. These rates were similar when compared to the 1995 French national registry. While the rate of malformations was correlated with maternal age only, the frequency of Down's syndrome was correlated with maternal age and the age of the semen donor. Lansac et al. also demonstrated an 8 %

multiple gestation rate and a sevenfold increase in the rate of twins, supporting the restriction of superovulation [40].

Assisted Reproductive Technologies

It is worth mentioning that donor sperm can be used for in vitro fertilization (IVF) as well, if the woman has infertility factors necessitating IVF. The indications are the same as for donor insemination.

Conclusion

DI is a safe procedure that has been used throughout the last century. Some of the procedures and some of the types of patients have evolved over time. However, both men and women have benefitted from DI, as it has been used to build many healthy families.

References

1. Guttmacher AF. The role of artificial insemination in the treatment of sterility. Obstet Gynecol Surv. 1960; 15:767–85.
2. Polge C, Smith AU, Parkes AS. Revival of spermatozoa after vitrification and dehydration at low temperatures. Nature. 1949;164(4172):666.
3. Anger JT, Gilbert BR, Goldstein M. Cryopreservation of sperm: indications, methods and results. J Urol. 2003;170(4 Pt 1):1079–84.
4. Besselink DE, Farquhar C, Kremer JA, Marjoribanks J, O'Brien P. Cervical insemination versus intrauterine insemination of donor sperm for subfertility. Cochrane Database Syst Rev. 2008; (2):CD000317.
5. Curie-Cohen M, Luttrell L, Shapiro S. Current practice of artificial insemination by donor in the United States. N Engl J Med. 1979;300(11):585–90.
6. Palermo G, Joris H, Devroey P, Van Steirteghem AC. Pregnancies after intracytoplasmic injection of single spermatozoon into an oocyte. Lancet. 1992;340(8810): 17–8.
7. Schlegel PN, Palermo GD, Alikani M, Adler A, Reing AM, Cohen J, et al. Micropuncture retrieval of epididymal sperm with in vitro fertilization: importance of in vitro micromanipulation techniques. Urology. 1995;46(2):238–41.
8. Schlegel PN, Palermo GD, Goldstein M, Menendez S, Zaninovic N, Veeck LL, et al. Testicular sperm extraction with intracytoplasmic sperm injection for nonobstructive azoospermia. Urology. 1997;49(3):435–40.
9. 1995 evaluation of medically-assisted procreation with a donor. French Federation of CECOS. Contracept Fertil Sex. 1996;24(9):684–687.
10. Schover LR, Thomas AJ, Miller KF, Falcone T, Attaran M, Goldberg J. Preferences for intracytoplasmic sperm injection versus donor insemination in severe male factor infertility: a preliminary report. Hum Reprod. 1996;11(11):2461–4.
11. ESHRE Capri Workshop Group. Intrauterine insemination. Hum Reprod Update. 2009;15(3):265–77.
12. Practice Committee of American Society for Reproductive Medicine, Practice Committee of Society for Assisted Reproductive Technology. 2008 Guidelines for gamete and embryo donation: a Practice Committee report. Fertil Steril. 2008;90(5 Suppl):S30–44.
13. Belloc S, Cohen-Bacrie P, Benkhalifa M, Cohen-Bacrie M, De Mouzon J, Hazout A, et al. Effect of maternal and paternal age on pregnancy and miscarriage rates after intrauterine insemination. Reprod Biomed Online. 2008;17(3):392–7.
14. ACOG Committee on Genetics. ACOG Committee Opinion No. 442: preconception and prenatal carrier screening for genetic diseases in individuals of Eastern European Jewish descent. Obstet Gynecol. 2009;114(4):950–3.
15. American College of Obstetricians and Gynecologists Committee on Genetics. ACOG Committee Opinion No. 486: update on carrier screening for cystic fibrosis. Obstet Gynecol. 2011;117(4):1028–31.
16. ACOG Committee on Obstetrics. ACOG Practice Bulletin No. 78: hemoglobinopathies in pregnancy. Obstet Gynecol. 2007;109(1):229–37.
17. American Society for Reproductive Medicine. Guidelines for sperm donation. Fertil Steril. 2004;82 Suppl 1:S9–12.
18. Boomsma CM, Heineman MJ, Cohlen BJ, Farquhar C. Semen preparation techniques for intrauterine insemination. Cochrane Database Syst Rev. 2007;(4): CD004507.
19. Van Voorhis BJ, Barnett M, Sparks AE, Syrop CH, Rosenthal G, Dawson J. Effect of the total motile sperm count on the efficacy and cost-effectiveness of intrauterine insemination and in vitro fertilization. Fertil Steril. 2001;75(4):661–8.
20. Miller DC, Hollenbeck BK, Smith GD, Randolph JF, Christman GM, Smith YR, et al. Processed total motile sperm count correlates with pregnancy outcome after intrauterine insemination. Urology. 2002; 60(3):497–501.
21. Stone BA, Vargyas JM, Ringler GE, Stein AL, Marrs RP. Determinants of the outcome of intrauterine insemination: analysis of outcomes of 9963 consecutive cycles. Am J Obstet Gynecol. 1999;180(6 Pt 1): 1522–34.
22. Campana A, Sakkas D, Stalberg A, Bianchi PG, Comte I, Pache T, et al. Intrauterine insemination:

evaluation of the results according to the woman's age, sperm quality, total sperm count per insemination and life table analysis. Hum Reprod. 1996;11(4): 732–6.
23. Miller PB, Acres ML, Proctor JG, Higdon III HL, Boone WR. Flexible versus rigid intrauterine insemination catheters: a prospective, randomized, controlled study. Fertil Steril. 2005;83(5):1544–6.
24. Fancsovits P, Toth L, Murber A, Szendei G, Papp Z, Urbancsek J. Catheter type does not affect the outcome of intrauterine insemination treatment: a prospective randomized study. Fertil Steril. 2005; 83(3):699–704.
25. van der Poel N, Farquhar C, Abou-Setta AM, Benschop L, Heineman MJ. Soft versus firm catheters for intrauterine insemination. Cochrane Database Syst Rev. 2010;(11):CD006225.
26. Ayas S, Gurbuz A, Ayaz R, Asoglu MR, Selcuk S, Alkan A, et al. Efficacy of passive uterine straightening during intrauterine insemination on pregnancy rates and ease of technique. J Obstet Gynaecol Res. 2012;38(1):291–6.
27. Custers IM, Flierman PA, Maas P, Cox T, Van Dessel TJ, Gerards MH, et al. Immobilisation versus immediate mobilisation after intrauterine insemination: randomised controlled trial. BMJ. 2009;339:b4080.
28. Saleh A, Tan SL, Biljan MM, Tulandi T. A randomized study of the effect of 10 minutes of bed rest after intrauterine insemination. Fertil Steril. 2000;74(3):509–11.
29. Zreik TG, Garcia-Velasco JA, Habboosh MS, Olive DL, Arici A. Prospective, randomized, crossover study to evaluate the benefit of human chorionic gonadotropin-timed versus urinary luteinizing hormone-timed intrauterine inseminations in clomiphene citrate-stimulated treatment cycles. Fertil Steril. 1999;71(6): 1070–4.
30. Kosmas IP, Tatsioni A, Fatemi HM, Kolibianakis EM, Tournaye H, Devroey P. Human chorionic gonadotropin administration vs. luteinizing monitoring for intrauterine insemination timing, after administration of clomiphene citrate: a meta-analysis. Fertil Steril. 2007;87(3):607–12.
31. Cantineau AE, Janssen MJ, Cohlen BJ. Synchronised approach for intrauterine insemination in subfertile couples. Cochrane Database Syst Rev. 2010;(4): CD006942.
32. Jurema MW, Vieira AD, Bankowski B, Petrella C, Zhao Y, Wallach E, et al. Effect of ejaculatory abstinence period on the pregnancy rate after intrauterine insemination. Fertil Steril. 2005;84(3):678–81.
33. Tonguc E, Var T, Onalan G, Altinbas S, Tokmak A, Karakas N, et al. Comparison of the effectiveness of single versus double intrauterine insemination with three different timing regimens. Fertil Steril. 2010;94(4):1267–70.
34. Centola GM, Mattox JH, Raubertas RF. Pregnancy rates after double versus single insemination with frozen donor semen. Fertil Steril. 1990;54(6): 1089–92.
35. Matilsky M, Geslevich Y, Ben-Ami M, Ben-Shlomo I, Weiner-Megnagi T, Shalev E. Two-day IUI treatment cycles are more successful than one-day IUI cycles when using frozen-thawed donor sperm. J Androl. 1998;19(5):603–7.
36. Shenfield F, Doyle P, Valentine A, Steele SJ, Tan SL. Effects of age, gravidity and male infertility status on cumulative conception rates following artificial insemination with cryopreserved donor semen: analysis of 2998 cycles of treatment in one centre over 10 years. Hum Reprod. 1993;8(1):60–4.
37. Ferrara I, Balet R, Grudzinskas JG. Intrauterine insemination with frozen donor sperm. Pregnancy outcome in relation to age and ovarian stimulation regime. Hum Reprod. 2002;17(9):2320–4.
38. Ferrara I, Balet R, Grudzinskas JG. Intrauterine donor insemination in single women and lesbian couples: a comparative study of pregnancy rates. Hum Reprod. 2000;15(3):621–5.
39. Hoy J, Venn A, Halliday J, Kovacs G, Waalwyk K. Perinatal and obstetric outcomes of donor insemination using cryopreserved semen in Victoria, Australia. Hum Reprod. 1999;14(7):1760–4.
40. Lansac J, Thepot F, Mayaux MJ, Czyglick F, Wack T, Selva J, et al. Pregnancy outcome after artificial insemination or IVF with frozen semen donor: a collaborative study of the French CECOS Federation on 21,597 pregnancies. Eur J Obstet Gynecol Reprod Biol. 1997;74(2):223–8.

Sperm Donation: Legal Aspects

14

Stephanie O. Corley and Maxwell Mehlman

Introduction

Use of donor sperm is the "simplest, oldest, most common form" of third-party reproduction [1]. Insemination using donor sperm existed long before sperm banks were created in the 1970s with the advent of cryopreservation [2, 3]. Those first involved with sperm donation cut ethical corners by inseminating women using unscreened and untested donor sperm without the women's informed consent [4]. This practice is legally and ethically unacceptable [5, 6]. However, there is still no comprehensive regulation of sperm donation in the US [6]. Sperm donation is governed by a patchwork of federal and state laws [6]. The American Society for Reproductive Medicine (ASRM) and its affiliate Society for Assisted Reproductive Technology (SART) have proposed ethical guidelines for sperm donation, but they are voluntary [5, 6]. The lack of comprehensive sperm donor regulation leaves unresolved legal and ethical issues. For example, what happens when an infertility clinic inseminates a woman with sperm meant for another woman? Should there be limits on compensation for donor sperm? Should genetic testing and screening of sperm donors be mandatory? This chapter discusses these questions and provides an overview of the legal aspects of sperm donation.

Legal Framework

Depending on which aspect of sperm donation is being regulated, sperm donation may seem highly regulated or largely unregulated. For example, the FDA's regulations governing sperm donor eligibility have significant impacts on donors and recipients. They require extensive medical testing and screening of donors, as well as make ineligible men who engage in behavior deemed to create a high risk of transmitting communicable diseases [7]. States have created a patchwork of laws and judicial decisions relating to sperm donation and parentage, child support, contractual arrangements, privacy, informed consent, and laboratory qualifications. Yet many states uphold traditional notions of "family" and do not address the growing use of sperm donation by single individuals and same-sex couples [8]. Other aspects of sperm donation remain largely unregulated, such as donor compensation, limits on the number of offspring, and donor anonymity.

S.O. Corley (✉)
Dean Lindsey Cowen Research Fellow,
Case Western Reserve University School of Law,
11075 East Boulevard, Cleveland, OH 44106, USA
e-mail: stephanie.corley@case.edu

M. Mehlman
The Law Medicine Center, Case Western Reserve University School of Law, Cleveland, OH, USA
e-mail: mjm10@case.edu

J.M. Goldfarb (ed.), *Third-Party Reproduction: A Comprehensive Guide*,
DOI 10.1007/978-1-4614-7169-1_14,

Federal Law

The US Department of Health and Human Services (HHS), Centers for Disease Control and Prevention (CDC), Centers for Medicare and Medicaid Services (CMS), and the Food and Drug Administration (FDA) have regulatory responsibilities for the infertility industry [9]. Federal statutes affecting assisted reproductive technologies (ART) include the Fertility Clinic Success Rate and Certification Act of 1992 (FCSRCA) [10], the Clinical Laboratory Improvement Act of 1988 (CLIA) [11], and the Federal Food, Drug, and Cosmetic Act (FFDCA) [9, 12]. Because ART and some medical procedures related to sperm donation are the practice of medicine, other federal statutes also indirectly regulate fertility clinics. For example, the Federal Trade Commission (FTC) regulates ART advertising and intervened in a case of false advertising by a fertility clinic [13]. Discussing all the federal statutes that indirectly apply to the practice of medicine is beyond the scope of this chapter.

Laboratory Certification and Quality

CLIA was enacted to improve the quality of clinical laboratory services "by establishing standards for accuracy, reliability, and timeliness of patient test results" [9]. CMS is responsible for implementing CLIA [9], and most clinical laboratories must be CLIA certified [14]. CLIA permits accreditation through programs run by the American Association of Blood Banks (AABB), the American Osteopathic Association (AOA), the American Society for Histocompatibility and Immunogenetics (ASHI), COLA, the College of American Pathologists (CAP), and The Joint Commission (TJC) [15]. Laboratories may also be accredited through their state Department of Health [16].

CLIA only applies to labs conducting tests used in the diagnosis of infertility. Procedures carried out in embryology laboratories (e.g., oocyte fertilization) are considered patient therapy (practice of medicine) rather than testing (laboratory diagnosis) [9, 16]. Testing performed by andrology laboratories, including semen analysis such as sperm count, motility, and morphology, is diagnostic and governed by CLIA [9, 16].

Qualifying laboratories must register and be surveyed to become CLIA certified [9]. Infertility clinics may face civil fines for violating CLIA requirements, as well as suspension, limitation, or revocation of their CLIA certificates [11]. Civil fines and imprisonment may be imposed on persons for intentional violation of CLIA requirements [11].

Laboratory Personnel Standards

CLIA establishes standards for laboratory personnel that are based upon the level of complexity of testing conducted in the lab. The most complex level is "high-complexity testing" [16]. Andrology laboratory testing (e.g., semen analysis) is considered high-complexity testing, so andrology lab directors must meet CLIA qualifications. [16]. To be a CLIA-certified laboratory, laboratory directors must be board certified (discussed below), hold an advanced degree (e.g., MD, DO, or PhD), and meet other training requirements [16]. CLIA also establishes education and training standards for other andrology lab personnel [17, 18]. Civil fines and imprisonment may be imposed on persons for intentional violation of CLIA requirements [11].

Although CLIA laboratory personnel standards do not apply to embryology laboratories, laboratory personnel often perform both embryology and andrology procedures, so employers typically require all lab personnel to meet CLIA's high-complexity testing standards [16, 19]. In addition, ASRM has published guidelines for embryology and andrology laboratories and lab personnel, recommending that both embryology and andrology laboratory directors be board certified and hold an advanced degree [18]. ASRM guidelines are discussed in greater detail below.

Donor Eligibility

The FDA regulates sperm donation through its regulation of human cells, tissues, and cellular

and tissue-based products (HCT/Ps) [7]. Establishments performing one or more manufacturing steps for HCT/Ps must register with the FDA's Center for Biologics Evaluation and Research (CBER) [7]. The definition of "manufacturing" is expansive and includes "any or all steps in the recovery, processing, storage, labeling, packaging or distribution of any human cell or tissue, and the screening or testing of the cell or tissue donor" [7, § 1271.3(e)]. With limited exceptions, clinics performing sperm donation meet the FDA's definition of manufacturing because "recovery" is defined as "obtaining from a human donor cells or tissues that are intended for use in human implantation, transplantation, infusion, or transfer" [7, § 1271.3(ii)]. In most instances, clinics will perform the other manufacturing steps as well [7]. The FDA's HCT/Ps regulations also specify required documentation, written manufacturing procedures, and storage requirements [7]. In addition, fertility clinics qualifying under the FDA's HCT/Ps rules are subject to inspection by the FDA [7].

The FDA also establishes Current Good Tissue Practices (CGTP) requirements to prevent the introduction, transmission, or spread of communicable diseases in the manufacturing of HCT/Ps [7]. A detailed discussion of FDA registration, inspection, and CGTP provisions is beyond the scope of this chapter.

Medical Testing and Screening of the Donor

The FDA requires that sperm donors be tested and screened for evidence of communicable-disease agents or diseases (e.g., HIV) [7]. Testing refers to laboratory testing (e.g., serologic tests) [5] and is required upon donation or within 7 days before or after the recovery of cells or tissue [20]. Samples must be frozen and quarantined for at least 6 months and not released until the donor is retested for communicable diseases and the results are negative [20]. Screening of sperm donors also includes an assessment of specific historical factors to determine whether the donor is at an increased risk for a relevant disease [5]. A positive screening result may cause ineligibility [20].

Not all donors must be tested and screened. The FDA places donors into three categories: (1) anonymous, (2) directed, and (3) sexually intimate partner (SIP). Anonymous donors must undergo all FDA testing, screening, retesting, and quarantine requirements [7]. However, anonymous donors may undergo abbreviated screening if a complete donor screening was performed within the previous 6 months [21]. Unlike anonymous donors, a directed donor is known to the recipient before the donation and directs his sperm to be used by a particular recipient [7]. A directed donor is exempt from the 6-month retesting requirement [7, 21]. A recipient can elect to use a directed donor's sperm even if the FDA testing or screening would make the donor ineligible for anonymous donation [7]. If the directed donor is deemed ineligible based upon screening and/or testing results, the HCT/Ps must be clearly labeled: "WARNING: Advise patient of communicable disease risks," and, in the case of reactive test results, "WARNING: Reactive test results for (name of disease agent or disease)" [7, § 1271.65(b)(2)–(3)]. Thus, with informed consent of the communicable disease risk or disease agent, a recipient may use sperm from an HIV-positive directed donor (or another otherwise ineligible donor) [7]. This policy is commonsensical because a woman could elect to traditionally conceive (through coitus) with a man whom she knows is HIV positive. Testing and screening are not required for a SIP [7, 21]; intimate partners already are at risk for transmission of infectious disease.

Based upon the FDA's definitions, a non-anonymous donor could be either a directed donor or a SIP. However, in lay taxonomy, a non-anonymous donor tends to refer to a donor who permits offspring to know his identity and who also may permit future contact [22, 23]. For purposes of this chapter, "non-anonymous" is defined by the lay taxonomy.

Ineligible Donor

In an attempt to limit transmission of STDs, HIV, and other communicable diseases transmissible via sperm donation, the FDA recommends that

certain potential donors be ineligible based upon high-risk factors such as sexual intercourse with another man, nonmedical use of injectable drugs, and unsterile body piercings or tattoo procedures [7, 20]. These restrictions are time limited, with ineligibility for nonmedical use of injectable drugs covering use within the preceding 5 years, ineligibility due to unsterile body piercings or tattoo procedures (or if the use of sterile procedures is unknown) covering the preceding 12 months, and the restriction on men who have sex with men (MSM) covering the preceding 5 years [20]. This last rule is particularly harsh because, in order to donate sperm, homosexual men must be abstinent for 5 years.

Prohibiting sexually active homosexual men from donating sperm has been called discriminatory [24]. The FDA does not place the same emphasis on high-risk heterosexual men, and no sperm donor deferral policy exists for men who have had unprotected sex with high-risk female partners [24]. Moreover, there is no distinction for homosexual men who have protected sex or for men in a monogamous relationship [24]. Additionally, some argue that, owing to advances in technology, there is no medical basis for the FDA's restriction, especially considering the FDA's stringent waiting and retesting regulations [25]. The FDA may reconsider its MSM policy in the near future because lawmakers have urged HHS to conduct a pilot study to assess the FDA's ban on blood donation from MSM [26]. If HHS changes its criteria for MSM blood donors, this could lead to a change in its deferral policy for MSM sperm donors.

Challenges to FDA Regulation

Some individuals prefer to donate and receive sperm outside of the clinical setting. This practice may result in FDA investigation and penalties. In 2010, after FDA investigation, CBER ordered Trent Arsenault to cease "manufacturing" his sperm [27]. Arsenault is a California man who was donating his sperm for free direct to women via online advertising [28]. The FDA found that Arsenault recovered and distributed 328 donations intended for artificial insemination of 46 different recipients [27]. Arsenault is not the only person donating his sperm free of charge outside of sperm banks; in fact, there is a registry of free sperm donors [29]. The FDA's main concern is that Arsenault and others are not tested for communicable diseases in compliance with the law [27].

In 2012, under the pseudonym Jane Doe, a lesbian filed suit against HHS and the FDA challenging the constitutionality of requiring directed sperm donors to undergo testing and screening when similar requirements are not imposed on SIPs [30]. Doe cites the FDA's enforcement action against Arsenault as cause for concern over whether her directed sperm donor can lawfully avoid the FDA-required testing and screening [30]. Arsenault's and Doe's attorneys work for a government accountability organization, Cause of Action, which argues that regulating private uncompensated sperm donation is beyond the government's constitutional authority [31, 32].

Whether the FDA has the incentive or resources to pursue donors who are less prolific than Arsenault is unclear. The FDA's policy states that it will prosecute individuals when there is documented evidence of fraud, gross violations, hazard to health, and/or continuing significant violations [33]. Penalties for violating the HCT/Ps regulations include imprisonment for up to 1 year and fines up to $100,000, if death has not resulted from a violation, and up to $250,000, if death has resulted [33].

State Law

States have few laws or regulations governing sperm donation [8]. When state law does not address aspects of sperm donation, courts apply existing law on a case-by-case basis [8]. This subsection provides an overview of state laws that directly or indirectly affect sperm donation and is meant to inform the reader of the range of laws that may affect sperm donation in any given state. Specific statutes, model acts, and court opinions are used

as examples to provide clarification. Lists of state statutes are included when possible, but these lists may not be comprehensive.

Family Law

In states that address the parentage of sperm donors, the sperm donor typically is not considered the legal father of a child born by using artificial insemination [34]. Over half of US states have statutes addressing paternity of a child born to a married couple through use of ART [8, 35]. For the husband to be treated as the natural father, many of these states require the husband's or both spouse's written consent [8, 35]. Some also require the involvement of a licensed physician [8, 35].

The Uniform Parentage Act (UPA) [36], which states may adopt, includes a section on assisted reproduction and attempts to settle some parentage and child support (discussed below) issues [8]. But not all states have incorporated this section [8]. In 2008, the American Bar Association drafted the "American Bar Association Model Act Governing Assistive Reproductive Technology (February 2008)" (ABA Model Act) [37]. The ABA Model Act duplicates most of the UPA provisions [38]. One key distinction between the UPA and the ABA Model Act is that the Model Act's language is gender neutral [39]. For example, it refers to "legal spouse," which means that the provisions apply to same-sex couples in states that recognize domestic partnership, civil unions, or same-sex marriage [38].

The UPA creates a presumption that the husband of a wife who gives birth by means of sperm donation is the parent of the child [36]. The husband (or legal spouse) cannot challenge parentage of the child under either act if he provided sperm for, or before or after the birth of the child consented to, the sperm donation, cohabitated with the mother since the probable time of assisted conception, and if he holds the resulting child out as his own [36, 37]. Upon marriage dissolution, if a husband (or legal spouse) withdraws consent prior to the transfer of sperm, eggs, or embryos, he is not treated as the legal parent under either act [36, 37]. Consent or withdrawal of consent must be in a written or electronic record [36, 37]. Additionally, both acts state that a "donor is not a parent of a child conceived by means of assisted reproduction" [36,§ 702; 37,§ 602] unless he provides sperm for, "or consents to, assisted reproduction by a woman … with the intent to be a parent of [the resulting] child …." [36, § 703; 37,§ 603].

The rare sperm donation misuse case shows the difficulty in creating a comprehensive parentage statute that is equitable for all involved. In *Robert B. v. Susan B.* [40], spouses Robert and Denise B. used a donor's egg and Robert's sperm to get pregnant. Inadvertently, a single woman, Susan B., was also given embryos from the same group created by the married couple. Robert B. never intended to contribute his sperm to anyone other than his wife, Denise. Nevertheless, once Robert B. discovered the mistake, he sued for custody of the resulting child. The gestational mother, Susan B., argued that Robert B. should not be granted custody and should be treated merely as a sperm donor under the law [40]. However, Robert B. did not qualify as a donor because California law required Robert B. to intend to donate his sperm to a woman other than his wife [40]. Thus, the court decided that both Robert B. and Susan B. were the child's legal parents, and Robert B. was given visitation rights [40]. This resolution was relatively equitable because both Robert B. and Susan B. were given legal parental rights. Nevertheless, the misuse of Robert B.'s sperm caused him to become an unwitting anonymous sperm donor to Susan B. and created a parentage relationship with a woman other than his wife. Yet no statute can anticipate every unique parentage circumstance that may arise from sperm donation. Some statutes, such as the ABA Model Act, do a better job at framing the law to include nontraditional parentage relationships, including single parents and same-sex couples.

Contract Law

When parties attempt to establish paternity in advance of artificial insemination, complying

with existing family law state statutes is essential for enforcement of the contract [8]. For example, in *Jhordan C. v. Mary K.* [41], a California Appellate Court held that the sperm donor was the natural father because the parties "failed to take advantage of th[e] statutory basis for preclusion of paternity" [41, p. 389]. In order for a sperm donor to not be considered the resulting child's natural father, the donor sperm had to be provided to a licensed physician. But Jhordan C. provided his sperm directly to Mary K., and Mary K. self-inseminated. Because the parties circumvented medical assistance (and because they maintained Jhordan C.'s relationship with the child), Jhordan C. was granted legal parental rights to the parties' resulting child against Mary K.'s objections.

Parties will need to determine whether an oral agreement is sufficient. Some statutes, such as those in North Carolina and New York, require paternity agreements relating to artificial insemination to be in writing [35]. Many states, along with the UPA and ABA Model Act, look for the parties' intent to establish paternity [8, 36, 37], and one way to prove intent is through a written agreement. Even if a state does not require a written agreement, it is advisable. In addition, parties should be aware that, even if there is a written or oral agreement, a party may be prevented or "estopped" from denying his or her consent. To make a case under the theory of equitable estoppel, consent is based upon a party's conduct [8]. For example, in *Thomas S. v. Robin Y.* [42], a mother was estopped from denying the directed sperm donor's parentage because of the donor's permitted involvement with the child over a substantial period of time.

Although some states have statutes exempting sperm donors from child-support obligations and both the UPA and ABA Model Act exclude sperm donors from child support, a sperm donor nevertheless may become responsible for child support [8, 36, 37]. If state law does not address this issue, a directed sperm donor may not be able to avoid child support, even if the parties entered into a contract that said that he was not required to do so [8]. Public policy in many states does not permit biological parents to bargain away a child's right to financial support [8].

Privacy

Unlike countries such as Sweden and the UK, US law does not require sperm donors to disclose their identity to offspring [39, 43, 44]. Donors are free to choose whether they wish to remain anonymous or to disclose their identity or have future contact with offspring. Whether a donor's status is anonymous or non-anonymous is governed by the sperm bank's policy and the contract between the bank and donor [39]. Yet, a sperm bank cannot guarantee anonymity legally or practically [8].

Even when donors contract to donate anonymously, the donor's right to medical privacy may be limited. The UPA and some states permit access to a sperm donor's file by court order [44]. In *Johnson v. Superior Court* [45], a California Appellate Court held that a sperm bank's attempt to preclude disclosure of the donor's identity and other information pertaining to the donor under all circumstances is contrary to public policy. Part of the basis for the court's decision was the contract between the sperm bank and donor, which contemplated limits on the donor's privacy. Although the court permitted disclosure of the donor's identity, it also held that the trial court should craft an order to partially protect John Doe's and his family's identity, suggesting that "[a]ttendance at the deposition could be limited to the parties' counsel and the deposition transcript might refer simply to 'John Doe' as the deponent" [45, p. 1072].

Informed Consent

In 1884, physician and professor of surgery William Pancoast used a medical student's sperm to inseminate a female patient without her consent at the Jefferson Medical College in Philadelphia [4, 22]. Today, however, lack of consent is unlawful and unethical and would give rise to a cause of action for battery or negligence.

Informed consent in general requires medical professionals to inform patients of the proposed treatment, risks and benefits of using donor sperm, and any alternatives [37, 46]. The American Medical Association (AMA) recommends that donors be informed of the reasons for screening and confidentiality, as well as the extent of access to nonidentifying and identifying information about the donor [46]. Another important consideration is the impact compensation may have on donors. Consent should ensure that the choice to be a sperm donor is voluntary and free from coercion [5].

Sperm Bank and Physician Liability

Sperm bank and physician liability cases frequently relate to the loss or misappropriation of sperm [47]. In misappropriation cases, as discussed in *Robert B. v. Susan B.*, there is heightened complexity because a child has been conceived and the mistake creates parentage disputes [40]. If a cryopreserved sperm vial is lost or accidentally destroyed, the harm may be very small. Unlike eggs, sperm is replenishable.

In a sperm misappropriation case, *Harnicher v. University of Utah Medical Center* [48], the sperm bank used the wrong anonymous donor sperm, resulting in a suit claiming malpractice and negligent infliction of emotional distress. David and Stephanie Harnicher never intended to know whether their children, triplets, were conceived with donor sperm or with David's sperm. The couple intentionally used an insemination procedure that mixed both David and the preferred donor's sperm so that they could believe that their children were all David's biological children. It was later revealed when one of the children fell ill that two of a set of triplets were conceived using neither David's nor the preferred donor's sperm. The Utah Supreme Court held that the "destruction of a fiction cannot be grounds for either malpractice or negligent infliction of emotional distress" [48, p. 72]. The dissent criticized the majority for failing to recognize the emotional harm caused by the loss of believing that your children are biologically related, noting: "The trial court and the majority appear convinced that the loss of an unassailable assurance that one's children carry one's genes is of negligible value. Such a conviction is belied by the extraordinary lengths to which thousands of people in this era will go to pursue biological parenthood" [48, Durham J, dissenting, p. 75].

Failure to report a genetic disease or to test or screen for genetic diseases is another potential source of liability for fertility clinics and physicians. In *Johnson v. Superior Court* [49], the California Appellate Court denied a child's wrongful life claim against the California Cryobank and two physicians for failing to report that the sperm donor had a genetic history of autosomal dominant polycystic kidney disease (ADPKD). The Johnsons' daughter, Brittany, was born with ADPKD. The court held that the donor's gene, and not the clinic and physicians, was the cause of the disease [49].

In *Donovan v. Idant Labs* [50], a Pennsylvania federal district court ruled that sperm is a product and strict products liability applies under New York law. The mother of a daughter with Fragile X, along with the daughter, brought a claim against Idant Labs for strict liability alleging that Idant improperly screened and sold its "product"—sperm. Although the court dismissed the mother's claim because it was barred by the statute of limitations, the court permitted the daughter's claim to proceed under a strict products liability theory [50]. However, the Third Circuit dismissed the daughter's claim because it held that it was essentially a claim for wrongful life, which is not recognized in New York. Wrongful life claims are rejected by many states because it is difficult to say that no life would be better than being born and the damages are difficult or impossible to calculate [6, 47].

In addition to liability for medical negligence, physicians may lose their medical license or be held criminally liable. Dr. Cecil Jacobson, who used his own sperm instead of anonymous sperm to inseminate over 70 patients, was convicted of fraud and perjury and served 5 years in federal prison [6]. Dr. Jacobson's medical license also was revoked [51].

State Clinical Laboratory Personnel Licensing

Eleven states require clinical laboratory personnel to hold a state license [52]. Those states are California, Florida, Hawaii, Louisiana, Montana, Nevada, New York, North Dakota, Rhode Island, Tennessee, and West Virginia [52]. Puerto Rico also requires licensure [52]. South Carolina and Missouri recently proposed clinical laboratory personnel licensure bills [53, 54]. Licensure requirements vary from state to state. They typically include minimum education and professional competency requirements [52]. Georgia does not require laboratory personnel licensing, but has laboratory personnel standards [52, 55]. For example, in Georgia, a clinical laboratory director must hold a Georgia license to practice medicine and surgery, or a Georgia license to practice dentistry, or a doctoral degree in biology, microbiology, chemistry, or a related field [55]. He or she must also be certified or eligible for certification by the American Board of Bioanalysts, among others, or have laboratory training and experience acceptable to the Georgia Department of Human Services [55].

Certification and Sperm Bank Qualification

California, Delaware, Georgia, Illinois, and New York have licensing or registration requirements for tissue banks and/or sperm banks [56]. State licensure statutes may require protocols related to semen handling and sperm donor screening in addition to steps required by the FDA. For example, Georgia's licensure of clinical laboratory statute mandates quality control for sperm banks, including requiring the processing of semen specimens within 1 hour of collection [55]. The statute also requires sperm banks to use an appropriate method of cryopreservation that "ensures maximum viability and freedom from contamination" [55, § 290-9-8-.17].

Medical Evaluation Requirements

New Hampshire requires sperm donors to undergo medical evaluation and to be deemed "medically acceptable" before an insemination procedure is performed [57]. Georgia requires sperm banks to conduct a sperm donor history, which covers personal, physical, sexual, and genetic histories [55]. Georgia also requires semen to be examined to "ensure viability and motility, freedom from infection and/or foreign cells, and freezing survival capabilities" [55, § 290-9-8-.17].

Mandatory Insurance Coverage

A minority of US states mandate insurance coverage for some or all infertility services. States that either require insurance companies to cover or offer coverage for infertility diagnosis and treatment include Arkansas, California, Connecticut, Hawaii, Illinois, Louisiana, Maryland, Massachusetts, Montana, New Jersey, New York, Ohio, Rhode Island, Texas, and West Virginia [58]. Infertility is not uniformly defined. For example, in Connecticut, infertility is "the condition of a presumably healthy individual who is unable to conceive or produce conception or to sustain a successful pregnancy during a one-year period" [59]. In Massachusetts, by contrast, "infertility" is "the condition of an individual who is unable to conceive or produce conception during a period of 1 year if the female is under the age of 35 or younger or during a period of 6 months if the female is over the age of 35" [60]. If a person does not carry a pregnancy to live birth, the time spent attempting to conceive prior to achieving that pregnancy is included in the calculation of the 1-year or 6-month period [58]. Some states have additional limits on who qualifies for infertility insurance coverage, which can impact sperm donation. For example, IVF coverage is permitted in Maryland only if the oocyte is fertilized with the spouse's sperm [61].

States limit the reach of their infertility insurance mandates in a variety of other ways. Maryland exempts businesses with 50 or fewer employees [58]. Many states provide exemptions for religious employers [58]. Hawaii, Illinois, Maryland, and Massachusetts only require coverage if the health insurance plan provides "pregnancy-related benefits" [58]. It also is important to note that ERISA preempts state law, so employers that self-insure are exempt from state health insurance coverage mandates [8].

States that mandate insurance coverage for infertility may not include coverage for the costs of using donor sperm. For example, in states that only permit IVF if the oocyte is inseminated with a spouse's sperm, procedures involving anonymous or directed donor sperm would not be covered—even if the couple is infertile due to male-factor infertility. In addition, in states that do not specifically restrict insurance coverage to heterosexual couples, it is not always clear whether "infertility" includes same-sex couples. For example, California's definition of infertility requires "a demonstrated condition recognized by a licensed physician and surgeon as a cause of infertility" or the inability to conceive or carry out a pregnancy to live birth "after a year or more of regular sexual relations without contraception" [62, 63]. The California law does not explicitly limit insurance coverage mandates to heterosexual couples, but the statutory language is ambiguous [63].

Professional Self-Regulation

The infertility industry self-regulates through professional membership organizations and board certification [9]. For the most part, self-regulation is voluntary and there is no legal penalty for failing to meet guidelines or standards. Self-regulation is criticized for being too lax, since professional guidelines are written by physicians and embryologists [6]. Another criticism is that these organizations have no enforcement mechanism other than denying or revoking membership or accreditation [6]. However, professional standards can be used as evidence of the standard of care for physicians or clinics performing reproductive medicine [64].

Professional Membership Societies

Professional self-regulation in the infertility industry is led by the American Society for Reproductive Medicine (ASRM) and its affiliate, the Society for Assisted Reproductive Technology (SART). ASRM was established in 1944 and is considered a leading professional organization for physicians practicing reproductive medicine [17]. ASRM's members are multidisciplinary, including obstetricians and gynecologists, reproductive endocrinologists, embryologists, urologists, nurses, and mental health professionals [65]. ASRM's Ethics, Patient Education, and Practice Committees publish ethical and practice guidelines, minimum standards, and patient education booklets and pamphlets [65]. ASRM publishes its guidelines in *Fertility and Sterility*, a well-respected peer-reviewed medical journal in obstetrics and gynecology [65].

Often ASRM and SART work together to develop ethical and practice guidelines and minimum standards for infertility clinics. For example, ASRM and SART published "Recommendations for Gamete and Embryo Donation: A Committee Opinion" [5]. These recommendations propose testing and screening guidelines for gamete and embryo donors. The recommendations incorporate FDA, CDC, and American Association of Tissue Banks (AATB) information and regulations, and are more stringent than the FDA's minimum requirements. For example, the FDA does not require testing or screening of recipients of donated gametes, which ASRM recommends.

The American Congress of Obstetricians and Gynecologists (ACOG) also includes reproductive endocrinologists [66]. ACOG is similar to ASRM and SART in that it keeps its members informed of current medical standards of care [66]. It publishes opinions, practice bulletins, and technology assessments [66]. ASRM and ACOG have also collaborated on practice guidelines [67].

Members of professional societies and associations are expected to adhere to the organizations' objectives and membership requirements. Nonadherence or ethical violations can lead to warning, censure, suspension, or revocation of membership [9]. As mentioned, however, the guidelines and standards are voluntary. Nevertheless, professional self-regulation may have some bite [64]. Some states have codified the professional membership organizations' or societies' standards of care. For example, Connecticut codifies ASRM and Society for Reproductive Endocrinology and Infertility standards of practice as state law [8, 59].

Board Certification

Infertility physicians are generally board certified by the American Board of Obstetrics and Gynecology (ABOG) or the American Board of Urology (ABU) [9]. Infertility specialists can also achieve subspecialty certification with additional training and passing appropriate examinations [9]. To maintain certification, board-certified physicians must fulfill continuing medical education and periodic reexamination requirements [9]. Board certification also may be required for hospital privileges [9]. Another impact of board certification is that board-certified physicians may be held to the standard of care of the specialty and/or subspecialty.

Embryologists and andrologists may be board certified as well. The American Board of Bioanalysis (ABB) is a CLIA-recognized certifying board for both embryologists and andrologists [68]. As discussed above, andrology labs fall under CLIA, and CLIA establishes multiple paths for qualifying as a high-complexity laboratory director, including but not limited to earning an MD or DO with board certification in anatomic or clinical pathology or both [18]. A PhD scientist may be board certified by the American Board of Medical Microbiology, American Board of Clinical Chemistry, the ABB, the American Board of Medical Laboratory Immunology, or another board deemed comparable by HHS [18]. Similar to physicians, a board-certified embryologist and andrologist may also be held to a heightened standard of care. Laboratory directors are not only responsible for themselves, but are also responsible for ensuring that their labs and lab personnel are properly staffed, educated, and trained [18].

Unregulated Aspects of Sperm Donation

While other countries have comprehensive statutes governing infertility services [6], the US regulatory system is far from comprehensive and has left many medical and ethical issues affecting sperm donation unregulated. Thus, many aspects of sperm donation are governed by professional self-regulation or driven by market forces [3]. Following is a brief overview of the ethical and relevant legal debates regarding compensation, genetic screening and testing, characteristic selection, intrafamilial donor limits, donor age, anonymity, and donor shortages.

Compensation

Although termed a sperm "donor," most eligible donors are paid for their sperm or for their time or inconvenience for donating, earning $50–$100 per sample [69]. There has been a considerable amount of debate regarding the commercialization of reproductive technologies including sperm donation [13]. ASRM recommends limiting compensation so that it is not the primary motivation for donating [5]. The practical benefits of paying for donor sperm are keeping donor pools large, creating a variety of donors, and paying donors for their time as they undergo rigorous testing and screening.

Genetic Testing and Screening

According to a survey conducted in 2010 of 18 US sperm banks across 12 states, genetic testing policies and practices at sperm banks vary considerably [70]. ASRM sets forth minimal

genetic-screening guidelines for sperm donors and recommends that donors be free from any major Mendelian disorder (e.g., Huntington's disease); any major malformation (e.g., spina bifida); significant familial disease with a genetic component in a parent, sibling, or offspring; or a known karyotypic abnormality that may result in chromosomal unbalance [5]. ASRM also recommends that all donors be tested for cystic fibrosis carrier status [5]. However, ASRM does not recommend chromosomal analysis for all donors [5]. ASRM notes that comprehensive genetic testing is impractical but that ethnically based genetic testing is standard in most sperm banks [2]. Ethnically based genetic testing is based upon the donor's ethnic background and family history [5]. If a donor is a member of a high-risk population group, ASRM recommends genetic counseling and testing for carrier status for any disease that the donor has a high risk of carrying (e.g., Tay-Sachs disease in Ashkenazi Jews) [5].

Some scholars recommend legally mandated genetic screening for all sperm donors in order to prevent transmission of donor-based genetic disorders [71]. A benefit from mandating genetic testing and screening for all donors is that, in the US a sperm donor is likely to conceive more children than a man who conceives children naturally [72]. This can create large numbers of children with donor-based genetic disorders. However, mandatory genetic screening and testing would increase costs [71]. ASRM recommends that the donor consent to notifying the program of any changes to the donor's health or risk-factor status [5], yet even if donors comply with post-donation reporting obligations, offspring may already be conceived before the sperm bank becomes aware of the donor-based genetic disorder. If genetic testing and screening is legally mandated, the scope of genetic disorders that make a sperm donor ineligible should be carefully considered. If donors become ineligible for a greater number of genetic disorders such as those that occur later in life, there may be a reduction in the eligible sperm donor pool. This would be problematic because by some accounts, currently only 3 %–10 % of potential sperm donors are eligible [69, 73].

Characteristic Selection

Recipients select sperm donors based upon donor characteristics, including physical characteristics (e.g., eye and hair color), ethnicity, and blood type [69, 73, 74]. Commonly, recipients also look for education, socioeconomic status, and other factors that may result more from nurture than nature [74]. One sperm bank that no longer operates became well known for initially recruiting Nobel Laureate donors [4, 73, 74]. This may seem excessive, but other forms of private selective breeding are legally tolerated in the US, such as debutante balls, arranged marriages, and matchmaking services [74].

Characteristic selection occurs both by sperm banks and recipients. Even if a donor is technically eligible, he must be selected by a recipient in order for the sperm bank and donor to make money [69]. Thus, sperm banks take great care to find donors with "sellable" traits, which include education, personality (e.g., "adorable, caring, and sweet"), age, weight, and height and may also include having diverse racial, ethnic, or religious backgrounds, or that the donor is willing to donate non-anonymously [69]. Moreover, sperm banks spend a great deal of time testing and screening potential donors [69]. Only a small percentage of potential donors are eligible based upon objective criteria [69]. Sperm banks therefore look for eligible donors willing to commit themselves to providing sperm for an entire year [69].

Intrafamilial Donor Limits

Another potential limitation on sperm donors is intrafamilial donation [75]. The ASRM Ethics Committee considers it unethical to use intrafamilial donation when the arrangement would otherwise be considered "true consanguineous or incestuous unions." For example, in the case of father-to-daughter sperm donation, the father's contribution to the daughter gives a strong impression of incest [75]. Intergenerational gamete donation, a parent donating to a child or vice-versa, is discouraged by ASRM in most situations. The risk of confusion about parenting relations

and lineage is great [75]. A son who donates to his father would be both genetic father and social half brother [75]. The rearing father of the resulting child would also be the genetic grandfather [75]. In addition, ASRM is concerned about undue influence on the donor. In parent–child relationships, it would be almost impossible to determine whether the donor is making an autonomous decision because emotional and/or financial dependence is inherent in the parent–child relationship [75].

In some instances, intragenerational sperm donation is more acceptable than intergenerational [75]. For example, a brother-to-brother arrangement eliminates incest concerns [75]. This arrangement also reduces genetic and social relationship confusion. The donor is the genetic father and the social paternal uncle, and the rearing father is the genetic uncle, but other relationships are unchanged [75]. However, in all intrafamilial sperm donation arrangements, the ASRM Ethics Committee recommends that heightened screening and counseling be undertaken to "ensure that the interest of all parties are protected" [75, p. 802]. The committee recommends that standards governing anonymous sperm donation be followed in regard to screening of sperm for infectious and genetic diseases and that freezing and quarantine guidelines be followed [75]. The committee notes that in many cases, the delay for quarantining discourages a couple from pursuing intrafamilial donation. Additionally, ASRM recommends against minors being allowed to participate in arrangements [75]. Finally, ASRM recommends that participants (including participants' partners) seek independent legal advice, ensuring that legal parenting relationships are established and that the arrangement is not prohibited under state law [75].

Limiting Donor Age

The ARSM recommends that sperm donors be of legal age [2], which is necessary for informed consent (in most instances) and entering into contractual arrangements. It also recommends that donors be "ideally less than 40 to minimize the potential hazards of aging" [2, p. 10], since as donors age, there is a greater chance that their sperm will contain genetic mutations and studies show that age affects sperm quantity and motility and that it impacts fertility [76, 77].

Anonymous Versus Non-anonymous Sperm Donation

Although ASRM recommends that the use of donor sperm be disclosed to the resulting child [78], some parents prefer not to tell their children or to limit the information shared [46]. In addition, maintaining donor privacy is a concern [22, 23, 39]. Currently, there is a movement towards non-anonymous gamete donation due to the belief that children have the right to know their origins and genetic background. [22, 23, 79]. Children conceived with the use of anonymous sperm are likened to adoptive children, and studies have shown that insecurities arise in adoptees because of the lack of information about the child's biological parent(s) [22, 23]. In addition, health concerns and fear of accidental consanguinity are legitimate arguments for non-anonymous sperm donation [22]. There are websites that children born from donor sperm can search to find siblings and donors [80]. Finally, the UK and other countries that have moved to non-anonymous ART systems have faced donor shortages [39, 43, 81].

Donor Shortages

Countries that have imposed legal restrictions on sperm donors, such as Sweden and the UK, have experienced shortages of donor sperm [39, 43]. These restrictions include anonymity and limiting donor compensation [39, 43]. If similar limits were made legally binding in the US, a sperm donor shortage could result in the US as well. This might cause some women to obtain sperm from men who circumvent sperm banks, thereby avoiding testing and screening, so that use of their sperm increases the risk of communicable-disease transmission. Recipients might travel to

other countries for ART services, which can create legal uncertainty over parent–child relationships, and may be exploitative to native populations [82]. Finally, donor shortages may result in increased costs for those who use donor sperm.

Conclusion

ART legal scholars Charles Kindregan and Maureen McBrien note that "ART practices are so politically sensitive that the political branches of government are unlikely in the very near future to take a firm hand in addressing them and attempting to legislate specific norms" [8, p. 219]. Yet thousands of children are born through the use of donor insemination every year. Inevitably, parentage disputes arise, and consumers need protection from unethical practitioners who do not comply with voluntary practice guidelines and standards. A federal statute would promote uniform regulation and potentially enhance enforcement. Yet comprehensive regulation could create donor shortages. In the absence of adequate legal regulation, professional organizations must shoulder the burden of promoting quality and protecting patients [9]. If professional self-regulation is insufficient, additional legal regulation may become necessary.

References

1. Zeifman DM, MA JE. Experimental examination of women's selection criteria for sperm donors versus life partners. Personal Relationships. 2012. doi: 10.1111/j.1475-6811.2012.01409.x.
2. American Society for Reproductive Medicine [Internet]. Birmingham: American Society for Reproductive Medicine; c2012 [cited 2012 Nov 20]. Third-party reproduction (sperm, egg, and embryo donation and surrogacy): a guide for patients revised 2012; [about 20 pages]. Available from: http://www.asrm.org/uploadedFiles/ASRM_Content/Resources/Patient_Resources/Fact_Sheets_and_Info_Booklets/thirdparty.pdf
3. Pietrzak A. The price of sperm: an economic analysis of the current regulations surrounding the gamete donation industry. J Law Fam Stud. 2012;14(1):121–35.
4. Plotz D. The genius factory: the curious history of the Nobel prize sperm bank. New York: Random House; 2005. p. 159–61.
5. Practice Committee of the American Society for Reproductive Medicine; Practice Committee of the Society for Assisted Reproductive Technology. Recommendations for gamete and embryo donation: a committee opinion. Fertil Steril. 2013;99(1):47–62. http://www.asrm.org/uploadedFiles/ASRM_Content/News_and_Publications/Practice_Guidelines/Guidelines_and_Minimum_Standards/2008_Guidelines_for_gamete(1).pdf.
6. Daar J. Federalizing embryo transfers: taming the wild west of reproductive medicine? Columbia J Gend Law. 2012;23(2):257–325.
7. 21 C.F.R. Part 1271 (2012).
8. Kindregan CP, McBrien M. Assisted reproductive technology: a lawyer's guide to emerging law and science. 2nd ed. Chicago: American Bar Association; 2011. 1–33, 39–90, 136, 218–231.
9. ASRM.org [Internet]. Birmingham: American Society for Reproductive Medicine; c2010. Executive summary: oversight of assisted reproductive technology; [cited 2012 Nov 20];[about 2 screens]. Available from: http://www.asrm.org/uploadedFiles/Content/About_Us/Media_and_Public_Affairs/OversiteOfART%20(2).pdf
10. 42 U.S.C. Sect. 263a-1 to 263a-7 (2006).
11. 42 U.S.C. Sect. 263a (2006); 42 C.F.R. Sects. 493.1800(a)(3)(i), 1834 (2011).
12. 21 U.S.C. Sect. 301 (2006).
13. Daar JF. Reproductive technologies and the law. Newark: LexisNexis/Matthew Bender; 2006. 249–60, 688–90.
14. Department of Health and Human Services; Centers for Medicare and Medicaid Services [Internet]. Baltimore: Department of Health and Human Services; Centers for Medicare and Medicaid Services; c2012; Medicare Learning Network: Clinical Laboratory Improvement Amendments (CLIA); [cited 2012 Nov 20]; [about 3 screens]. Available from: http://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/Downloads/CLIABrochure.pdf
15. Department of Health and Human Services; Centers for Medicare and Medicaid Services [Internet]. Baltimore: Department of Health and Human Services; Centers for Medicare and Medicaid Services; c2006; Clinical Laboratory Improvement Amendments (CLIA): how to obtain a CLIA certificate; [cited 2012 Nov 20]; [about 5 screens]. Available from: http://www.cms.gov/Regulations-and-Guidance/Legislation/CLIA/downloads/How Obtain CLIACertificate.pdf
16. Keel BA, Schalue TK. Reproductive laboratory regulations, certifications, and reporting systems. In: Carrell DT, Peterson CM, editors. Reproductive endocrinology and infertility: integrating modern clinical and laboratory practice. New York: Springer; 2010. p. 55–70.
17. Adamson D. Regulation of assisted reproductive technologies in the United States. Fam Law Q. 2005; 39(3):727–44.

18. Practice Committee of the American Society for Reproductive Medicine; Practice Committee of the Society for Assisted Reproductive Technology. Revised guidelines for human embryology and andrology laboratories. Fertil Steril. 2008;90 Suppl 3:S45–59.
19. Wegner CC. Fertility Lab Insider Blog [Internet]: Wegner CC. 2012 Apr 26 [cited 2012 Nov 20]. Available from: http://fertilitylabinsider.com/2012/04/q-from-u-us-standards-for-embryologists-and-fertility-labs/
20. U.S. Food and Drug Administration [Internet]. Rockville: U.S. Food & Drug Administration; [2007 Aug]. Guidance for industry: eligibility determination for donors of human cells, tissues, and cellular and tissue-based products; [updated 2012 Apr 19; cited 2012 Nov 20]; [about 6 screens]. Available from: http://www.fda.gov/biologicsbloodvaccines/guidancecomplianceregulatoryinformation/guidances/tissue/ucm073964.htm
21. U.S. Food and Drug Administration [Internet]. Rockville: U.S. Food & Drug Administration; [date unknown]. Donor eligibility final rule and guidance questions and answers; [updated 2009 Apr 20; cited 2012 Nov 20]; [about 4 screens]. Available from: http://www.fda.gov/BiologicsBloodVaccines/TissueTissueProducts/QuestionsaboutTissues/ucm102842.htm
22. Dennison M. Revealing your sources: the case for non-anonymous gamete donation. J Law Health. 2008;21:1–27.
23. Gong D, Liu Y, Zheng Z, Tian Y, Zheng L. An overview on ethical issues about sperm donation. Asian J Androl. 2009;11(6):645–52.
24. Littrell B. Bias against gays and lesbians. The New York Times (The Opinion Pages) [Internet]. 2011 Sep 14 [cited 2012 Nov 20]. Available from: http://www.nytimes.com/roomfordebate/2011/09/13/making-laws-about-making-babies/fertility-industry-victimizes-gays-and-lesbians
25. Boso LA. The unjust exclusion of gay sperm donors: litigation strategies to end discrimination in the gene pool. West VA Law Rev. 2008;110(2):843–82.
26. Wetzstein C. Dem lawmakers urge study, call for end of gay-blood ban. The Washington Times [Internet]. 2012 Jun 11 [cited 2012 Nov 20]. Available from: http://www.washingtontimes.com/blog/inside-politics/2012/jun/11/dem-law makers -urge -study -call-end-gay-blood-ban/
27. U.S. Food and Drug Administration [Internet]. Rockville: U.S. Food and Drug Administration Center for Biologics Evaluation and Research; [2010 Nov 1]. Order to cease manufacturing HCT/Ps – Trent Arsenault; [updated 2010 Nov 5; cited 2012 Nov 20]; [about 5 screens]. Available from: http://www.fda.gov/BiologicsBloodVaccines/SafetyAvailability/TissueSafety/ucm232852.htm
28. Allday E. Sperm donor in Fremont feeling heat from feds. SFGate [Internet]. 2011 Dec 19 [cited 2012 Nov 20]. Available from: http://www.sfgate.com/health/article/Sperm-donor-in-Fremont-feeling-heat-from-feds-2411681.php
29. Knowndonorregistry.com [Internet]. [place unknown]: Known Donor Registry; c2012 [cited 2012 Nov 20]. Available from: http://knowndonorregistry.com/
30. Complaint, Doe v Hamburg, No. C-12-03412 (Cal. N. Dist. Ct. 2012). Available from: http://causeofaction.org/2012/07/02/coa-brief-in-jane-doe-v-fda/
31. CauseofAction.org [Internet]: Cause of Action; c2012 [updated 2011 Nov 7; cited 2012 Nov 20]. CoA stands up against government regulation of private choices; [about 3 screens]. Available from: http://causeofaction.org/2011/11/07/coa-stands -up-against -government -regulation-of-private-choices/
32. CauseofAction.org [Internet]: Cause of Action; c2012 [updated 2012 Jul 2; cited 2012 Nov 20]. Cause of Action sues FDA for overreach into private lives; [about 3 screens]. Available from: http://causeofaction.org/2012/07/02/cause -of -action -sues-fda -for-overreach -into-private-lives/
33. U.S. Food and Drug Administration [Internet]. Rockville: U.S. Food and Drug Administration Center for Biologics Evaluation and Research; [date unknown]. Inspection of human cells, tissues, and cellular and tissue-based products (HCT/Ps); [updated 2012 Apr 16; cited 2012 Nov 20]; [about 5 screens]. Available from: http://www.fda.gov/biologicsbloodvaccines/guidancecomplianceregulatoryinformation/complianceactivities/enforcement/complianceprograms/ucm095207.htm
34. *See, e.g.,* Ala. Code § 26-17-702; Cal. Fam. Code § 7613(b); Colo. Rev. Stat. Ann. § 19-4-106(2); Conn. Gen. Stat. Ann. § 45a-775; Del. Code. Ann. tit 13, § 8–702; D.C. Code § 16-909(e)(2); Idaho Code Ann. § 39-5405(1); 750 Ill. Comp. Stat. Ann. 40/3(b); Kan. Stat. Ann. § 23-2208(f); Minn. Stat. Ann. § 257.56(2); Mont. Code Ann. § 40-6-106(2); Nev. Rev. Stat. Ann. § 126.061(2); N.J. Stat. Ann. § 9:17-44(b); N.M. Stat. Ann. § 40-11A-702; N.D. Cent. Code Ann. § 14-20-60; Ohio Rev. Code Ann. § 3111.95(B); Or. Rev. Stat. Ann. § 109.239(1); Tex. Fam. Code Ann. § 160.702; Utah Code Ann. § 78B-15-702; Va. Code Ann. § 20-158(A)(3); Wash. Rev. Code Ann. § 26.26.705; Wis. Stat. Ann. § 891.40(2); Wyo. Stat. Ann. § 14-2-902.
35. *See, e.g.,* Ala. Code § 26-17-702, 703; Alaska Stat. Ann. § 25.20.045; Ark. Code Ann. § 9-10-201(a); Cal. Fam. Code § 7613(a); Colo. Rev. Stat. Ann. § 19-4-106(1); Conn. Gen. Stat. Ann. § 45a-774; Fla. Stat. Ann. § 742.11(1); Idaho Code Ann. § 39-5405(3); 750 Ill. Comp. Stat. Ann. 40/3(a); Kan. Stat. Ann. § 23–2302; La. Civ. Code Ann. art. 188; Md. Code Ann., Est. And Trusts § 1-206(b); Mass. Gen. Laws Ann. ch. 46, § 4B; Minn. Stat. Ann. § 257.56(1); Mont. Code Ann. § 40-6-106(1); Nev. Rev. Stat. Ann. § 126.061(1); N.J. Stat. Ann. § 9:17-44(a); N.Y. Dom. Rel. Law § 73; N.C. Gen. Stat. Ann. § 49A-1; Ohio Rev. Code Ann. § 3111.95(A); Okla. Stat. tit. 10, § 552; Tenn. Code Ann. § 68-3-306; Tex. Fam. Code Ann. § 160.703; Utah Code Ann. § 78B-15-703; Va. Code Ann. § 20-158(2); Wis. Stat. Ann. § 891.40(1).

36. Unif. Parentage Act §§ 102(18), 204, 702–706 (amended 2002).
37. Am Bar Ass'n Model Act Governing Assisted Reprod Tech. §§ 102(33), 201, 602–606, 802 (2008).
38. Kindregan CP, Synder SH. Clarifying the law of ART: the new American Bar association model act governing assisted reproductive technology. Fam Law Q. 2008;42:203–29.
39. Cahn N. The new kinship. Georgetown Law J. 2012;100(2):367–429.
40. Robert B. v. Susan B., 109 Cal. App. 4th 1109, 1111–13, 1117 (Cal. Ct. App. 2003).
41. Jhordan C. v. Mary K., 179 Cal. App. 3d 386, 389–94, 397–98 (Cal. Ct. App. 1986)
42. Thomas S. v. Robin Y., 618 N.Y.S.2d 356, 362 (N.Y. App. Div. 1994).
43. Bernstein G. Regulating reproductive technologies: timing, uncertainty, and donor anonymity. Boston Univ Law Rev. 2010;90(3):1189–219.
44. Pi VL. Regulating sperm donation: why requiring exposed donation is not the answer. Duke J Gend Law Policy. 2009;16:379–401.
45. Johnson v. Superior Court, 80 Cal. App. 4th 1050, 1065–67, 1072 (Cal. Ct. App. 2000).
46. American Medical Association [Internet]. Chicago: American Medical Association; c1995-2012 [updated 2004 Dec; cited 2012 Nov 20]. Opinion 2.05 – Artificial insemination by anonymous donor; [about 4 screens]. Available from: http://www.ama-assn.org/ama/pub/physician-resources/medical-ethics/code-medical-ethics/opinion205.page
47. Crockin SL, Jones HW. Legal conceptions: the evolving law and policy of assisted reproductive technologies. Baltimore: Johns Hopkins University Press; 2010. p. 176–87.
48. Harnicher v. Univ of Utah Med Ctr, 962 P.2d 67, 68, 72, 75 (Utah 1998).
49. Johnson v. Superior Court, 101 Cal. App. 4th 869, 873, 886–89 (Cal. Ct. App. 2002).
50. Donovan v. Idant Labs, 625 F. Supp. 2d 256, 262–68, 273–76 (E.D. Pa. 2009).
51. Conviction upheld in fertility case. The New York Times [Internet]. 1993 Sep 8 [cited 2012 Nov 20]. Available from: http://www.nytimes.com/1993/09/08/us/conviction-upheld-in-fertility-case.html
52. ASCLS.org [Internet]. Tysons Corner: American Society for Clinical Laboratory Science; c2012 [cited 2012 Nov 20]. Personnel Licensure; [about 2 screens]. Available from: http://www.ascls.org/?page=Grad_PL
53. H.R. 4611, 119th Gen. Assemb., Reg. Sess. (S.C. 2012).
54. S. 544, 96th Gen. Assemb., 2d Reg. Sess. (Mo. 2012).
55. Ga. Comp. R. & Regs. 290-9-8.06, 290-9-8-.17.
56. Cal. Health & Safety Code § 1635.1 (West 2012); Del. Code Ann. tit. 16, § 2801 (West 2012); Ga. Comp. R. & Regs. 290-9-8.04; 20 Ill. Comp. Stat. Ann. 2310/2310-330 (West 2008); N.Y. Pub. Health Law §§ 4360(1), 4360(10), 4364 (McKinney 2012).
57. N.H. Rev. Stat. Ann. § 168-B:10 (LexisNexis 2010).
58. National Conference of State Legislatures [Internet]. [Denver or District of Columbia]: National Conference of State Legislatures (NCSL); c2012 [updated 2012 Mar; cited 2012 Nov 20]. State laws related to insurance coverage for infertility treatment; [about 3 screens]. Available from: http://www.ncsl.org/issues-research/health/insurance-coverage-for-infertility-laws.aspx
59. Conn. Gen. Stat. Ann. § 38a-536(a) (West 2012)
60. Mass. Gen. Laws Ann. ch. 176A, § 8k (West Supp. 2010).
61. Md. Code Ann., Ins. § 15–810 (LexisNexis 2008).
62. Cal. Health & Safety Code § 1374.55(b) (West 2012)
63. Rank N. Barriers for access to assisted reproductive technologies by lesbian women: the search for parity within the healthcare system. Houst J Health Law Policy. 2010;10(1):115–46.
64. Robertson JA. The octuplet case why more regulation is not likely. Hastings Cent Rep. 2009;39:26–8.
65. ASRM.org [Internet]. Birmingham: American Society for Reproductive Medicine; c1996-2012 [cited 2012 Nov 20]. Vision of ASRM; [about 2 screens]. Available from: http://www.asrm.org/about/
66. ACOG.org [Internet]. Washington DC: The American Congress of Obstetricians and Gynecologists; c2012 [cited 2012 Nov 20]. The American college of obstetricians and gynecologists: the nation's leading authority on women's health for more than 50 years; [about 2 screens]. Available from: http://www.acog.org/~/media/About%20ACOG/ACOGFactSheet.pdf
67. The Committee on Gynecology Practice of the American College of Obstetricians and Gynecologists; The Practice Committee of the American Society for Reproductive Medicine. Age-related fertility decline: a committee opinion. Fertil Steril. 2008;90 Suppl 3:S154–5.
68. AAB.org [Internet]. St. Louis: American Board of Bioanalysis; [date unknown] [cited 2012 Nov 20]. Available from: http://www.aab.org/aab/American_Board_of_Bioanalysis.asp
69. Almeling R. Gender and the value of bodily goods: commodification in egg and sperm donation. Law Contemp Probl. 2009;72(3):37–58.
70. Sims CA, Callum P, Ray M, Iger J, Falk RE. Genetic testing of sperm donors: a survey of current practices. Fertil Steril. 2010;94(1):126–9.
71. Daar JF, Bryzski RG. Genetic screening of sperm and oocyte donors: ethical and policy implications. JAMA. 2009;302(15):1702–4.
72. Mroz J. In choosing a sperm donor, a roll of genetic dice. The New York Times [Internet]. 2012 May 14 [cited 2012 Nov 20]. Available from: http://www.nytimes.com/2012/05/15/health/in-sperm-banks-a-matrix-of-untested-genetic-diseases.html?pagewanted=all
73. Katz G, Schweitzer SO. Implications of genetic testing for health policy. Yale J Health Policy Law Ethics. 2010;10:90–134.

74. Mehlman M. Modern eugenics and the law. In: Lombardo PA, editor. A century of eugenics in America: from the Indiana experiment to the human genome era. Bloomington: Indiana University Press; 2011. p. 219–40.
75. The Ethics Committee of the American Society for Reproductive Medicine. Using family members as gamete donors and surrogates. Fertil Steril. 2012;98(4):797–803.
76. Naik G. Autism risk rises with fathers' age: study finds older dads are more likely to pass on harmful genetic mutations. Wall Str J. 2012 Aug 23;Sect. A3.
77. Rabin R. It seems the fertility clock ticks for men, too. The New York Times [Internet]. 2007 Feb 27 [cited 2012 Nov 20]. Available from: http://query.nytimes.com/gst/fullpage.html?res=9D06E4DC1E3EF934A15751C0A9619C8B63&pagewanted=2
78. Committee of the American Society for Reproductive Medicine. Informing offspring of their conception by gamete donation. Fertil Steril. 2004;81(3):527–31.
79. Ravitsky V. "Knowing where you come from": the rights of donor-conceived individuals and the meaning of genetic relatedness. Minn J Law Sci Technol. 2010;11(2):655–84.
80. Donor Sibling Registry [Internet]. Nederland (CO): Donor Sibling Registry; c2000-12 [cited 2012 Nov 1]. Available from: https://www.donorsiblingregistry.com/
81. Blyth E, Frith L. Donor-conceived people's access to genetic and biographical history: an analysis of provisions in different jurisdictions permitting disclosure of donor identity. Int J Law Pol Fam. 2009;23:174–91.
82. Ikemoto LC. Reproductive tourism: equality concerns in the global market for fertility services. Law Inequal. 2009;27(2):277–309.

Sperm Donation: Psychological Aspects

15

William D. Petok

Introduction

Donor insemination (DI) is the oldest form of third-party reproduction. It has a long and storied history, often clouded in mystery, misperception, and missing or secret information. Since collection of sperm is considered a "low-tech" procedure that is noninvasive to the donor, the complex psychosocial issues have often been overlooked [1]. Evaluation and counseling of both donor and recipient are often disregarded, unlike in oocyte donation where professional guidelines have existed for several decades. Today, despite advances in treating male infertility, including the widespread use of intracytoplasmic sperm injection (ICSI), DI still takes place with significant regularity. The psychological components of DI have an impact on three distinct sets of parties: donors, recipients, and the resultant children. The scientific advances and changes in contemporary values have also made it possible for DI to assist not only heterosexual couples in their family-building quests but also lesbian couples and single women. As the technology of DI has evolved, so has our understanding of the psychology of it.

W.D. Petok (✉)
Independent Practice Baltimore, Maryland, 5608 Greenspring Avenue, Baltimore, MD 21209, USA
e-mail: bpetok@comcast.net

History

Historical accounts indicate that the first artificial insemination (AI) was conducted by the Dutch scientist Leeuwenhoek, who is credited with identifying spermatozoa via the microscope in 1677. In 1799, the English anatomist Hunter is reported to have created the first pregnancy resulting from AI. Apparently, neither of the recipient parents knew about the procedure. The woman was anesthetized so she would not be aware of the process [2]. The first US artificial insemination was performed by Sims in the 1860s. DI that produced a live child was first conducted in 1884 but was not reported until 1909 [3]. Fifty-five years after the account was published, there was still speculation that the author of the article was himself the donor [4].

Since there are no central registries for births that result from DI in most countries, only estimates are available on the actual numbers of children resulting from the process. Estimates of US births from donor insemination in 1995 are 40,000 or more. Since that time, the use of sperm donation has decreased because of the availability of ICSI. ICSI can now be used as a treatment for low sperm counts that before ICSI could not be expected to result in a pregnancy. Calculations for Great Britain suggest that between 1992 and 2000, over 15,000 children were born. German estimates are that 50,000 were born between 1970 and 2000, with about 500 currently born each year [1].

J.M. Goldfarb (ed.), *Third-Party Reproduction: A Comprehensive Guide*,
DOI 10.1007/978-1-4614-7169-1_15,

While male factor and female factor infertility occur in almost equivalent rates in the population, medical research and treatment have focused more on female infertility than they have on male infertility. Membership in the American Society for Reproductive Medicine (ASRM) highlights this discrepancy. In 2007, reproductive endocrinologists and obstetrician/gynecologists comprised slightly over 90 % of the medical professional membership of ASRM. Urologists and andrologists made up the difference [5]. Professional literature further corroborates this but indicates a trend toward more research on male factor infertility over time. In between 1967 and 1971, publication was skewed to female factor by almost 2:1. By 1991, the ratio had become almost 1.1:1 [6]. With a larger medical community focused on female infertility, issues related to male factor have received less attention that is subsequently reported in popular press and enters public consciousness.

Male factor infertility has always had the stigma of compromised virility and, by association, compromised sexual ability attached to it. Since DI typically involves masturbation to produce a specimen, it is further laden with taboo sexual connotations. Finally, DI requires the participation of a second man for impregnation, thereby insinuating sexual relations outside a marital union [1]. The net result of these factors was a long-held view that DI was suspicious and even morally untenable.

The legal, moral, and ethical issues surrounding DI have taken place in courts and religious circles. A 1954 article on DI in the British Medical Journal prompted the Archbishop of Canterbury's Commission to label DI a criminal offense. The Pope declared DI a sin. And in 1963, the Supreme Court of Cook County in the USA ruled that DI was "…contrary to public policy and good morals…adultery on the mother's part." Furthermore, the court determined that children so conceived were born out of wedlock and therefore illegitimate [7]. With these highly negative pronouncements, it is highly understandable why secrecy about DI was prevalent.

But the tide of opinion began to turn in the mid-1960s. A year after the Cook County case, Georgia passed the first statute legitimizing children conceived with DI on the condition that both the husband and wife consented in writing. In 1968, a California case (People v. Sorenson) determined that a DI child was legitimate. Finally, in 1973 and 1974, the Uniform Parentage Act was approved by the Commissioners on Uniform State Laws and the American Bar Association. This act stated that if DI is done with physician supervision and husband consent, the child is considered as if he/she were the natural child of the donor [7]. These legal changes, along with cryopreservation advances, led to the development of sperm banks.

Physicians have long recommended secrecy about DI, with protection of the child and the couple as the primary objective. The presumed protection of the father is related to the inaccurate conflation of fertility and sexual ability. Protection of the child deals with the supposition that knowledge that her/his father was impaired would be psychologically damaging. At the same time, a growing awareness of the needs and rights of children conceived with DI to have access to biological information about their origin has led to laws allowing identification or contact with a donor. Since 1985, Sweden, Austria, Switzerland, Great Britain, and a number of Australian states have all passed legislation dealing with access to information for children. New Zealand has utilized identifiable donors for more than 15 years. The European Union requires member countries to document information about gamete donors for a minimum of 30 years. The ASRM recommended disclosure of donated gametes to offspring in 2004. However, other countries, notably Argentina, South Africa, and Israel, continue with anonymity. Italy does not allow treatment with donated gametes [1, 8].

Changes in sperm banking due to infection prevention have led to a 6-month delay between collection and possible use. Sperm is only released from cryopreservation for use after donors have been reassessed for infectious disease. Prior to these changes, most donors were privately arranged and screened. Consequently, data collection about the psychological and motivational factors of sperm donation received little

attention [9], in part due to the small numbers that might go through a particular practice. Today, because of the volume of donors that sperm banks see, more sophisticated screening on motivational and psychosocial variables should be more easily accomplished. However, unlike with oocyte donors, where practice standards and, in some instances, regulation include psychological assessment, sperm donors are rarely evaluated for psychological issues, motivation, or feelings about their donation.

Sperm Donors

Sperm donors with acceptable semen analysis parameters are an obvious requirement for successful DI. Issues of motivation and anonymity are at the core of the psychological concerns of sperm donors and those who recruit and utilize them.

Motivation

Prior to the growth of sperm banks, donors were recruited by physicians for specific situations and were often medical students, residents, and other graduate-level males. They were sometimes tested for sexually transmitted infections and then assigned according to phenotype to a recipient in the particular practice [9]. Their motivations for donating were twofold: the small fee they collected for each specimen and some desire to be helpful to someone less fortunate. With the advent of larger organizations and a more sophisticated system for recruiting, it appears that these same two motivations continue. However, some research with donors indicates that true donation without compensation would reduce the motivation of many men to participate [10–12]. A study of potential donors assessed their willingness to donate for research or to help produce a child with or without financial compensation yielded results, suggesting that altruism was not the primary motivator when a child would be the outcome. Men were most likely to donate sperm when the sperm was used for research only. Money did not provide an incentive to participate in research. Fewer men were willing to donate when monetary compensation was provided for sperm used in family building. The smallest number of men said they would donate for creation of a child when no financial offer was made [13]. The authors speculate that altruism in the form of donating for research is more powerful than donating to help create a child, particularly in the absence of compensation.

There do appear to be national differences in motivation to be a sperm donor as well as age-related differences. Donors in Australia and New Zealand more often highlight altruism as their primary motivation. Donors from the USA cite financial reward as their chief motivator. Other survey data indicate that in the UK, younger donors had payment as their primary motive, while older donors said altruism was their reason for participating [14]. Some have noted that as governments move toward identity-release requirements, recruitment of donors will be dependent on more clearly understanding the motivation to donate. To this end, more research that identifies the psychosocial parameters that influence donation will be necessary [15].

Anonymity

Donor anonymity has been deemed a barrier to a prospective child having access to half of his/her genetic history. At the same time, the threat of personal and financial claims against donors is seen as a primary reason for maintaining anonymity [14]. However, with the nature of contractual arrangements made by more sophisticated sperm banks, this seems unlikely. In fact, The Sperm Bank of California established an identity-release program in 1983, so that adults could have access to information about their donor.

A significant debate has taken place on the matter of openness in donation versus anonymity. Sweden was the first country to pass non-anonymous legislation in 1985, making it possible for the children who are the result of DI to know who their donor is. Sweden also does not allow compensation other than for travel and work expenses. This is consistent with Swedish policy

on all organ donations. According to Swedish law, the donor has no rights or responsibilities to a child born as a result of his donation. He also has no right to the identity of the couple or the child. Parents are under no obligation to disclose to the child that donor sperm was used for conception. At 18 years of age, the child has the right to contact the donor and access to the records regarding the donation. At the same time, the child can then give the parents the right to contact the donor [16]. Research exists to support the notion that loss of anonymity has reduced the number of donors available in Sweden. At least one study shows that reduced availability of donor sperm or a reluctance to use an identifiable donor has increased travel abroad in order to obtain anonymous sperm donors [17].

It appears that men in relationships and men aged 26–45 prefer to remain anonymous. Single men and men under 26 are more comfortable with identity release. Men who are in single-sex relationships are more likely to accept release of their identity than men in heterosexual relationships [18].

While anonymity tends to be the rule at US sperm banks, a Donor Sibling Registry (DSR) was established in 2000 that allows a mechanism for contact between siblings of the same donor. Since each sperm bank in the USA assigns a unique identifying number to each donor, a method for contact between donor offspring and donors exists. This existing mechanism allows the DSR to be functional in the absence of a mandated registry. In general, parents of donor-created children speak positively about their experience with the registry [19]. This topic is discussed further in the following sections of this chapter.

Recipients

DI users generally fall into three categories: heterosexual couples in which the male has some anomaly that prevents the production or delivery of sperm to the ova or in which hereditary disease might be transmitted to a child; lesbian couples who wish to create a family; and single women who similarly desire a family and have no suitable partner.

Psychological Issues

The great majority of research about recipients has been limited to men's emotional reactions to their infertility. Secrecy has limited sample sizes. Factors that lead to couples choosing DI may be dissatisfaction with adoption and the small number of children available in this way, a desire to experience a pregnancy, or a desire to create a child with a genetic link to one parent [1]. Mason's qualitative project discussing male infertility with a small sample of men in the UK reported on their thoughts and feelings about various aspects of the subject. The section on DI noted that many men had to first come to terms with their inability to procreate before they could consider the option. Many recommended a slow approach to the topic because it raised issues of loss, defectiveness, shame, and humiliation [20]. They reported on the stigma they felt because of the perceived equivalence between male factor infertility and sexual inadequacy. It does appear that men prefer to receive emotional support for their infertility and choice to use DI from physicians who are providing their infertility services as opposed to mental health clinicians. This presents an interesting challenge for infertility physicians and their staffs, as graduate training for infertility physicians in this area tends to be limited compared to mental health clinicians [21].

Men have reported that they fear they could never love a baby created with DI because they have no genetic link to the child. Indeed, some see adoption as a "fairer" choice because neither parent will have a genetic stake. The option to employ DI may be delayed or avoided because a man could believe that discussing his feelings about the use of donor gametes is not manly. In some cases, ethnic, religious, or cultural barriers prevent him from considering DI as a viable option [22].

Within a couple, it is not unusual for one partner to have greater difficulty accepting and coping with the diagnosis. Some disagreement about moving to DI is also common. During the decision stage, it is possible for previously unresolved conflicts within the couple to surface. It is also common for couples to go through a grieving process that is the result of lost hopes and dreams about creating a child related to both on a

biological level. Shame and isolation can occur when the stigma of infertility is significant [1].

The marital and psychological adjustment of couples using DI has been evaluated, and the outcomes are all in the normal range [1]. Despite these findings, recent research indicates that both men and women believe that the use of donor sperm would lead to more marital difficulties than the use of donor eggs [23]. The authors note that since the use of donor sperm can cause social anxiety and the fear of disturbed marital relationships, mental health consultation should be considered a routine part of treatment for DI users as it is with donor ova. Care should be taken to present this as educational and not an evaluation of qualification to parent.

Disclosure Issues

Historically, as noted above, disclosure in DI was frowned on by both medical and lay communities. This was true for both the resultant child and friends and family of the donor recipients. Persistence of this attitude can be attributed to the slow speed with which opinion evolves in both arenas and the relatively late change in laws permitting DI. In addition, there is little popular press that addresses male factor infertility, in contrast to that which exists related to female factor. The result is a lack of public awareness about the issue, which could positively influence opinion about DI.

Until recently, writers have suggested that disclosure did not take place because recipients wanted to avoid the stigma of male infertility. Pregnancy achieved via DI is easily concealed in heterosexual couples, and many had opted for secrecy [1]. Other factors appear to have influenced parents' decisions to not disclose: a desire to protect children from the presumed distress of discovering that the men raising them were not involved in their creation, lack of access to information about the donor, protection of the father from rejection by the child, limited educational material on disclosure, and limited support and guidance on how to disclose to a child.

Interestingly, advances in genetic testing and the growing sophistication of the Internet and search engines provide a possibility that DI offspring will be able to ascertain their genetic connection (or lack thereof) to the families that raise them without direct information from those families in the not too distant future. Therefore, to not transmit accurate information creates the possibility that greater family problems could result from nondisclosure. Specifically, a child who discovers a lie about genetic origins may wind up distrusting parents on other matters as well. The net outcome could be ongoing discord and disruption during important psychosocial developmental stages.

Parental attitudes do appear to be changing. Studies in New Zealand, Sweden, Germany, and Great Britain all indicate that larger numbers of parents are disclosing to their children at young ages. Many reported that they intended to disclose in the future. These parents said that children had a right to the information. They also wanted to do away with the burden of secrecy and prevent disclosure by someone else or accidental discovery by the child [1].

Results of research on the effects of secrecy on family relationships have been a topic of the mental health literature, particularly as it relates to trust and communication. But similar research with regard to disclosure of DI has been limited. Adoption, an area that in some aspects resembles DI, has been researched with regard to disclosure. Negative effects on relationship satisfaction have been found. Conversely, disclosure has been associated with better communication between parents and children and parental satisfaction [24]. Research with families containing DI-conceived grown children demonstrated an inverse relationship between avoidance of the topic (DI) and family functioning. The authors note that the inability to have a control group of subjects in which no disclosure of DI took place limits the strength of conclusions that can be drawn from their work. Nevertheless, they suggest that parents can prevent suspicion and distrust with greater openness about DI.

Parents who actively determine to disclose offer a variety of reasons for doing so. The damaging nature of family secrets is often cited, as is the importance of a child knowing about origins. Many disclosing parents want to make DI seem a natural part of their relationship with the child. They frequently note that disclosure is sometimes a difficult process for them. Most do not regret having disclosed. Disclosing at an earlier age may

be somewhat easier than later in the child's life. Some speculate that the earlier one discloses the less the child understands, making it easier for the parent because there can be fewer difficult questions [25]. Of course, disclosure at an early age allows a parent to retell the story and refine it over time, reducing the parents' attendant anxiety.

Semantics do play a role in how information is transmitted regarding conception. Daniels and Thorn [26] highlight this when they write about "information sharing" as opposed to "telling" or concepts of "secrecy and openness," which carry emotional connotations. They note that "telling" an offspring about his or her creation has the potential to separate the child from the family. Information sharing is about family building and tends to be inclusive in nature, creating a sense of belonging to a larger unit. The emphasis in the story is about "us" versus "you." While they highlight the advantage for the child, implicit in their view is creation of a feeling of inclusion in parents as well, allowing them to view the child resulting from DI as part of their larger unit.

Same-sex couples and single women present a different picture with disclosure. Lesbian parents must consider not only the facts of the child's conception but also their lesbianism. Children do understand the concept of homosexuality by school age and can grasp and appreciate the additional difference that DI confers on them. Support groups are recommended to assist lesbian couples in how to disclose [27]. The published literature indicates that virtually 100 % of lesbian couples intend to disclose their use of DI to their children. Other work suggests disclosure rates for single women in the 91–100 % range [28]. Single women choosing to create a family via DI tend to do so in their late 30s and early 40s. Greater maturity and financial stability may be assumed with this group. Hence, decisions to disclose may involve a more sophisticated view of the psychological needs of children.

For single mothers who used DI, the disclosure will involve a story about how she chose to create a family and why she took a path that did not involve a partner. As single women choosing to create families without male partners have become more accepted socially, comparable acceptability within medical circles has grown. Solo mothers in small sample studies who conceive with DI are more likely to report their intention to be open about their child's donor origins than married women using DI [29]. In addition, more of these women intended to tell family and friends about their use of a donor. The reasons cited for openness with single mothers using DI were a desire to be honest with their child and a similar desire to avoid secrets in the family.

In general, mental health professionals working in the field of infertility are supportive of disclosure. Most will provide information on ways to disclose and inform recipients that a decision to disclose is a personal matter. Physicians routinely offer a polar opposite and recommend nondisclosure [30].

DI-Conceived Children

The overarching question about children conceived with DI is how they turn out. Measures of general health and psychological functioning are important to parents. In general, the medical literature on outcomes suggests that weight, prematurity, stillbirth, and sex ratios are similar to the overall population. This section will focus on the psychological outcomes.

Psychological Adjustment

A recent comprehensive review of outcome studies with children conceived with DI indicates that their development is comparable to children with genetic links to both of the parents who raise them [31]. Additionally, DI children in heterosexual families received higher quality of parenting, had fathers more active in childrearing, and experienced greater parental warmth.

The same review reported on studies with mother-headed DI families. The reviewers note that researchers have found no significant differences on mother's emotional involvement with their children or levels of stress associated with their children for single-mother and lesbian families when compared with naturally conceived heterosexual couple children. Furthermore, children in single-mother DI families had higher

levels of interaction with their mothers than children in naturally conceived families. In addition, these children perceived their mothers as more available to them.

Some age differences do exist with this same group of children. A longitudinal study found that at age 6, children in either single-mother or lesbian families were less competent on physical and cognitive variables than children in families with a father present. By age 12, no psychological well-being differences were found between the same groups. By age 19, the children from father-absent groups evidenced lower levels of anxiety, depression, hostility, and problematic alcohol use than children from naturally conceived families [32].

Psychosocial adjustment of children in lesbian families appears to be comparable to that of children raised in heterosexual families. There are some notable differences. Ten-year-old girls raised in lesbian families have lower problem behavior scores than the norms. At age 19, children raised in planned lesbian families displayed higher levels of self-esteem than those raised in traditional mother–father families [32]. One longitudinal study of children raised in fatherless families concluded that overall no serious negative consequences accrue with regard to quality of parenting and social and emotional development [33].

Disclosure Influences

Certainly the decision to not disclose can have no ramifications if offspring never discover they are donor conceived. However, as mentioned earlier, family therapy literature suggests that family secrets can have a detrimental impact. DI-conceived individuals who discover later in life the fact of their origin can experience a disruption of identity. In essence, they are not the persons they assumed they were.

Often parents contemplating disclosure expect it to be a one-time event undertaken with a more mature child. Clinical experience suggests that these conversations are ongoing and take on a different context and content for children at different ages. Toddlers may be satisfied with a narrative that mom and dad needed a helper to create their family. As a child ages, she/he may want more information about physical characteristics of the donor. In later adolescence, information about the donor's career, talents, and accomplishments may be more important. The result of re-sharing the information about how the family came to be creates a more normal and integrated story for the child and parents to incorporate into their history.

One finding from the social psychological research about disclosure is that parents want access to trained counselors who can help them with disclosure. They also report a desire for access to other parents who have successfully navigated similar waters [34].

Children whose heterosexual parents disclosed their conception via DI evidence fewer difficulties than children whose parents were non-disclosers [35]. Mothers in disclosing families reported less frequent and less intense arguments with their children. They also thought their children had lower levels of conduct problems. Self-reports indicated that disclosing parents felt they were more competent at parenting than did the non-disclosers. These data replicated an earlier study with comparable results [36]. The latter work found a lack of difference in father–child relationships between the differing decisions to disclose.

One small study of young children's reactions to disclosure found that the vast majority of children were neutral or had no reaction to the information. These young-aged children were similar to children in other studies. They typically respond in a factual and nonemotional way. The authors note that parents should be prepared for disclosure as an ongoing process [37].

In a study of 18 teenagers and adults conceived by DI who were informed of their donor conception later in life, feelings of mistrust, difference from the rest of the family, abandonment by professionals who had recommended secrecy, and feelings of loss and frustration about unobtainable donor information predominated [38]. This research has the limitation of a small sample that was obtained through support networks that favor disclosure and does point to a need for more research.

Special Issues

Mixing Sperm

Men with low sperm counts may ask to have their sperm mixed with the donor's sperm so that it might be theoretically possible that a child resulting from the insemination is his. The state of current paternity testing renders this an almost futile thought, because the genetic father can be easily determined. From a psychological perspective, the request suggests a man who has not come to terms with his own infertility and wishes to deny its existence. Some providers might want to indulge his fantasy and collaborate with the request. A thoughtful discussion about the disclosure, the existing research on secrets in families, and a referral to a counselor to help with the man's acceptance of his medical condition are in order.

Interfamily Donation

The use of a father's sperm for an azoospermic son is raised with some small regularity. Similarly, a brother may wish to donate to his male sibling to maintain a genetic line. While there may be advantages to these collaborations, they may also present unique problems, not the least of which is confusion in parentage for a resultant child. There is no literature available on the impact on children. Nevertheless, the issue is significant enough that ASRM Ethics Committee has published a comprehensive paper on the subject. If presented with a request to participate in the use of a family member as a donor, the clinician is strongly advised to review this document and share its findings with the patient [39].

Counseling for Donors and Recipients

Unlike with ovum donation, where counseling for donors and recipients is a routine matter, sperm donors and recipients are far less often offered this option, despite ASRM guidelines that recommend it. The guidelines specify that clinicians should "strongly recommend psychological counseling by a qualified mental health professional to all sperm donor recipients and their partners" and "psychological evaluation and counseling by a qualified mental health professional is strongly recommended for all sperm donors" [40].

Conclusion

DI is the oldest form of third-party reproduction, yet it is less openly discussed than any of the other procedures available to individuals with fertility problems. Shrouded in secrecy and conflated with sexual innuendo on several levels, the procedure that is helpful to so many is slowly beginning to be more openly addressed because of changing opinions about donors and legislation mandating openness in some countries.

Donors tend to have two primary motives for participating in DI programs: altruism and compensation. Differences in these motives appear to separate on the age dimension, with older donors indicating altruism as a primary motivation.

Disclosure, both about the use of a donor and the identity of the donor, is a major issue for couples and individuals to deal with when DI is employed. Research suggests that openness produces better psychological results for children conceived with donor sperm and for the families in which they are raised.

The limited amount of research on the psychological variables involved in DI has grown over the years but is limited by difficulty in obtaining significant sample sizes and problems with obtaining control groups.

References

1. Thorn P. Recipient counseling for donor insemination. In: Covington SN, Burns LH, editors. Infertility counseling: a comprehensive handbook for clinicians. New York: Cambridge University Press; 2006. p. 305–18.
2. Rose J. A critical analysis of sperm donation practices: the personal and social effects of disrupting the unity of biological and social relatedness for the offspring. Brisbane, Australia: Queensland University of Technology; 2009.

3. Hard AD. Artificial impregnation. Med World. 1909;27:163–4.
4. Morawski JG. Imaginings of parenthood: artificial insemination, experts, gender relations, and paternity. In: de Rivera J, Sarbin TR, editors. Believed in imaginings: the narrative construction of reality. Washington, DC: American Psychological Association; 1997. p. 229–46.
5. Petok WD. (2007) Male-factor infertility: psychological, sociological and cultural perspectives. American Society for Reproductive Medicine Postgraduate Course.
6. Carmeli YS, Birenbaum-Carmeli D. The predicament of masculinity: towards understanding the male's experience of infertility treatments. Sex Roles J Res. 1994;30:663–77.
7. Fader S. Sperm banking: a reproductive resource. Los Angeles: Cryobank, Inc.; 1993.
8. Sawyer N. Sperm donor limits that control for the 'relative' risk associated with the use of open-identity donors. Hum Reprod. 2010;25:1089–96.
9. Applegarth LD, Kingsberg SA. The donor as patient: assessment and support. In: Covington SN, Burns LH, editors. Infertility counseling: a comprehensive handbook for clinicians. New York: Cambridge University Press; 2006. p. 339–55.
10. Cook R, Golombok S. A survey of semen donation: phase II—the view of the donors. Hum Reprod. 1995;10:951–9.
11. Daniels KR, Curson R, Lewis GM. Semen donor recruitment: a study of donors in two clinics. Hum Reprod. 1996;11:746–51.
12. Lui SC, Weaver SM, Robinson J, Debono M, Nieland M, Killick SR, et al. A survey of semen donor attitudes. Hum Reprod. 1995;10:234–8.
13. Emond M, Scheib JE. Why not donate sperm? A study of potential donors. Evol Hum Behav. 1998; 19:313–9.
14. Kirkman M. Saviours and satyrs: ambivalence in narrative meanings of sperm provision. Cult Health Sex. 2004;6:319–35.
15. Yee S. "Gift without price tag": altruism in anonymous semen donation. Hum Reprod. 2009;24:3–13.
16. Sydsjo G, Lampic C, Brandstrom S, Gudmondsson J, Karlstrom P-O, Solensten NG, et al. Who becomes a sperm donor: personality characteristics in a national sample of identifiable donors. BJOG. 2012;119:33–9.
17. Ekerhovd E, Faurskov A, Werner C. Swedish sperm donors are driven by altruism, but shortage of sperm donors leads to reproductive traveling. Upsala J Med Sci. 2008;113:305–14.
18. Riggs DW, Russell L. Characteristics of men willing to act as sperm donors in the context of identity-release legislation. Hum Reprod. 2011;26:266–72.
19. Freemant JV, Kramer W, Golombok S. Gamete donation: parents' experiences of searching for their child's donor siblings and donor. Hum Reprod. 2009; 24:505–16.
20. Mason MC. Male infertility—men talking. London: Routledge; 1993.
21. Fisher JRW, Hammarberg K. Psychological and social aspects of infertility in men: an overview of the evidence and implications for psychologically informed clinical care and future research. Asian J Androl. 2012;14:121–9.
22. Schover LR, Thomas AJ. Overcoming male infertility. New York: Wiley; 2000.
23. Eisenberg ML, Smith JF, Millstein SG, Walsh TJ, Breyer BN, Katz PP. Perceived negative consequences of donor gametes from male and female members of infertile couples. Fertil Steril. 2010;94:921–6.
24. Paul MS, Berger R. Topic avoidance and family functioning in families conceived with donor insemination. Hum Reprod. 2007;22:2566–71.
25. Hunter M, Salter-Ling N, Glover L. Donor insemination: telling children about their origins. Child Psychol Psychiat Rev. 2000;5:157–63.
26. Daniels KR, Thorn P. Sharing information with donor insemination offspring. Hum Reprod. 2001;16:1792–6.
27. Jacob MC. Lesbian couples and single women. In: Burns LH, Covington SN, editors. Infertility counseling: a comprehensive handbook for clinicians. Pearl River, NY: Parthenon; 1999. p. 267–81.
28. Gartrell N, Hamilton J, Banks A, Mosbacher D, Reed N, Sparks CH, et al. The national lesbian family study: 1. Interviews with prospective mothers. Am J Orthopsychiatry. 1996;66:272–81.
29. Murray C, Golombok S. Going it alone: solo mothers and their infants conceived by donor insemination. Am J Orthopsychiatry. 2005;75:242–53.
30. Shehab D, Duff J, Pasch LA, MacDougall K, Scheib JE, Nachtigall RD. How parents whose children have been conceived with donor gametes make their disclosure decision: contexts, influences, and couple dynamics. Fertil Steril. 2008;89:179–87.
31. Bos H, van Balen H. Children of the new reproductive technologies: social and genetic parenthood. Patient Educ Couns. 2010;81:429–35.
32. Golombok S, Badger S. Children raised in mother-headed families from infancy: a follow-up of children of lesbian and single heterosexual mothers, at early adulthood. Hum Reprod. 2010;25:150–7.
33. MacCallum F, Golombok S. Children raised in fatherless families from infancy: a follow-up of children of lesbian and single heterosexual mothers at early adolescence. J Child Psychol Psychiatry. 2004;45: 1407–19.
34. Kirkman M. Parents' contributions to the narrative identity of offspring of donor-assisted conception. Soc Sci Med. 2003;57:2229–42.
35. Lycett E, Daniels K, Curson R, Golombok S. Offspring created as a result of donor insemination: a study of family relationships, child adjustment, and disclosure. Fertil Steril. 2004;82:172–9.
36. Golombok S, MacCallum F, Goodman E, Rutter M. Families with children conceived by donor insemination: a follow-up at age 12. Child Dev. 2002;73: 952–68.
37. Blake L, Casey P, Readings J, Jadva V, Golombok S. "Daddy ran out of tadpoles": how parents tell their

children that they are donor conceived, and what their 7 year olds understand. Hum Reprod. 2010;25:2527–34.
38. Turner A, Coyle A. What does it mean to be a donor offspring? The identity experiences of adults conceived by donor insemination and the implications for counseling and therapy. Hum Reprod. 2000;15:2041–51.
39. The Ethics Committee of the American Society for Reproductive Medicine. Using family members as gamete donors or surrogates. Fertil Steril. 2012;98:797–803.
40. The Practice Committee of the American Society for Reproductive Medicine. Recommendations for gamete and embryo donation: a committee opinion. Fertil Steril. 2013;99:47–62.

Sperm Donation: Ethical Aspects

16

Julie R. Severson

Introduction

Because the practice of sperm donation for third-party reproduction has been in place for decades, it seems that as a sophisticated, industrialized society, we would have solved the ethical dilemmas by now. Yet the proliferation of scholarship on the matter will alone testify that, alas, we have not. Classic ethical issues have lingered: for example, whether offspring of donor gametes have a moral (and, for that matter, legal) right to know their biogenetic origins. And new ethical issues—how to minimize the likelihood that gamete donors will transmit genetic disease to offspring, for one—have emerged in the wake of increased medical knowledge and reliance on assisted reproductive technologies (ART). In an attempt to take stock of both the classic and new ethical issues, this chapter lays out the most current and salient debates emerging from, and giving shape to, sperm donation practices in the USA. It concludes, in agreement with other scholars, that the industry—as well as the parties who use third-party reproduction—would benefit from more governmental oversight and updated regulations.

J.R. Severson (✉)
University of Washington School of Law 2, 419 E. Lake Washington Blvd, Seattle, WA 98112, USA
e-mail: severson@u.washington.edu

Sperm Banking in the United States, Donors, and Intended Parents

Scientists' and practitioners' experimental use of donated sperm to bring about successful pregnancies extends back decades—even centuries—but it was not until the 1950s, when true breakthroughs in cryopreservation began to challenge widely held values regarding human reproduction [1, 2]. The US's first sperm bank opened in 1971, and in 1978 sperm donation, like other reproductive issues, became more spoken about, when doctors delivered the world's first "test tube baby," Louise Brown [2, 3]. Since that time, a host of independent tissue banks have opened their doors, catering to the infertile, and have helped generate an industry projected to earn $4.3 billion in 2013 [4].

Today, approximately 550 companies are involved in sperm donation in the USA, and all are regulated rather minimally. The Food and Drug Administration (FDA) oversees donor screening, quality processes, and record keeping in an effort to ensure that infectious diseases remain out of the donor semen pool, but its policies leave many issues unaddressed [5]. Individual states also regulate the industry by licensing sperm banks, overseeing laws regarding parentage, and, to an extent, maintaining quality control, but only half of all states have engaged in this sort of regulation [6]. To fill the void, professional associations have issued best-practice guidelines. The American Association of Tissue Banks, the

J.M. Goldfarb (ed.), *Third-Party Reproduction: A Comprehensive Guide*,
DOI 10.1007/978-1-4614-7169-1_16,

American Fertility Society, the Society for Assisted Reproductive Technology (SART), and—perhaps the most central and influential when it comes to the ethical issues—the American Society for Reproductive Medicine (ASRM) have all published a number of recommendations. Yet their guidelines remain just that: nonbinding recommendations that sperm banks and clinics may or may not follow.

Within this context, the fertility industry has primarily let the marketplace dictate donor criteria. To donate sperm, a man must generally meet specific requirements. "Ideal" donors are heterosexual men who (usually) fall between the ages of 19 and 39, are college educated and disease-free, and reflect the more admired traits in society—whether or not these traits, such as good handwriting, have any grounding in genotype and can be passed on to offspring [7]. Donors who meet these varying clinical standards commit to donating on a regular, often weekly, basis over an extended period of time (usually 6 months to 2 years) and also commit to remaining abstinent 2–3 days prior to donating—a practice that ensures high-quality semen dense with spermatozoa.

Studies indicate that often a mixture of altruism and financial compensation motivates donors to accept these terms and donate regularly [8]. While purchasing human organs is illegal in the USA, donors are typically not paid for their sperm per se, but they are compensated roundly for their efforts [9]. Average sperm donors can make up to $12,000 a year for their donations [7]. And reports recently suggested that compensation for those holding doctorate degrees can amount to as much as $30,000 a year [10]. This compensation, combined with the fact that clinics primarily advertise donation as a means to financial gain, has led researchers to propose that compensation outweighs altruism as a motivational source [7].

Individuals who use donated sperm do so most commonly because they struggle with fertility due to the male partner having poor or no sperm. Often there is no known reason for the compromised sperm parameters. Known causes include hormonal, anatomic, and genetic abnormalities. In addition, chemotherapy and radiation therapy for cancer can compromise sperm production, as can, occasionally, environmental hazards, drug and alcohol use, and possibly even excessive stress [11]. In contrast to this more traditional, medically infertile group, single women and LGBTQI couples in which neither partner can contribute sperm face infertility, it can be said, due to social reasons and require male gametes to reproduce. Whether they are medically or socially infertile, however, hopeful parents-to-be find themselves perusing the same binders full of male gametes, looking for their perfect Mr. Y Chromosome.

As with other areas of scientific development that have challenged the moral status quo by expanding the realm of medical possibility, the cultural meaning of donated sperm has evolved over time. At first, many believed sperm donation used to facilitate others' reproduction was "contrary to public policy and good morals" and that it constituted adultery [12]. In the past few decades, however, the morality of sperm donation has become more of a settled issue—at least within the mainstream culture. Some Christian groups in the USA continue to insist that third-party reproduction commodifies human life and produces "scarred" offspring [13]. Yet, their concerns reveal a preoccupation with how the technology facilitates lesbian and single-parent families, a phenomenon they argue destabilizes "traditional" family values. As their objection focuses less on either sperm donation or third-party reproduction generally, but specifically on which individuals use donated sperm, it is difficult to conceptualize their objection as one so broad that it challenges the very morality of sperm donation for third-party reproduction [13]. Within the USA, sperm donation and third-party reproduction have generally settled into dominant cultural values and are here to stay.

The Issues

The practice of sperm donation in the context of third-party reproduction has inspired robust debate on several ethical issues. From the amount of compensation that donors receive for their efforts to the hierarchy of traits embodied

in this compensation; from limiting the number of donor offspring to whether and what offspring should learn of their biogenetic lineage; and, the latest to generate buzz, how to lessen the transmission of genetic disease from donor to offspring—each of these topics has garnered its share of attention. And, in the ethical concerns they raise, each calls upon the medical, legal, and bioethics communities to address whether the sperm donation industry requires further regulation and increased oversight. The remainder of this chapter charts the terrain created by the existing literature on this matter.

Donating Sperm: A Job or a Gift?

A fundamental ethical issue within the context of sperm donation pertains to the very nature of, and compensation received for, the act of donating gametes. While selling and purchasing human organs is illegal in the USA, and donors typically receive compensation for their efforts and altruism—that is, for the donation, not the sperm itself—industry practices have blurred this distinction somewhat [9]. Scholars who write on the matter argue that under the modern fertility industry, "sperm donation" has become a quaint euphemism and that the act of donating has assumed several dimensions of work. For starters, they point to sperm banks' recruitment of potential donors and how advertisements emphasize the regular and generous compensation donors can receive. Average sperm donors receiving $50–$75 per donation can generate over the course of a year up to $12,000, and elite donors can reportedly earn $500 per donation, up to $30,000 a year [7, 10, 14]. What's more, they say, the Internal Revenue Service treats this money as taxable income and requires that donors use a 1099 form as independent contractors [7]. Political scientist Cynthia Daniels argues that clinics unabashedly solicit donors, first with the economic benefits and only second with the feel-good altruistic bonus of helping individuals have children. "Be your own boss," one clinic's add touts, by earning "up to $1,000 a month." Only farther down does the ad mention helping "people fulfill their dreams of starting a family" [7].

Sociologist Rene Almeling argues this point further and suggests that sperm banks emphasize the economic reasons for donating to such a degree that many donors are often surprised by the news that their semen donation resulted in a pregnancy. According to Almeling, one donor even confessed that he "hadn't really thought about the fact there were gonna be pregnancies" [14]. If such revelations are "common," as one clinic manager suggests, they undermine the theory that altruism primarily motivates donations; certainly, donors whose altruism motivates them to give the gift of life to infertile families would likely have contemplated their donation could result in a pregnancy. Setting aside for the moment the quality of donor informed consent in these cases, scholars such as Daniels and Almeling have used the centrality of profit—for donors and clinics, alike—to point to the inherent ethical dilemma created in letting the free market self-regulate the "donation" of gametes. As a result, they call for increased governmental regulation to curb the market's influence on an otherwise unregulated industry [7, 14]. But whether sperm constitute commodity or gift, and whether payment constitutes compensation for altruism, or earned income for producing a product, marks only an entry point into the ethics of a discussion regarding sperm donation. Another ethical issue that emerges from the for-profit nature of the sperm donation industry is that its supply–demand cycle tends to make collection practices exclusive, some say neo-eugenic [15].

Exclusion and Discrimination: Problematic Sperm Bank Practices

Exclusionary and discriminatory screening practices lay at the core of the sperm donation industry, and both market influences and current government regulations are to blame. While not as expensive to purchase as donor ova, donor sperm are nonetheless costly—particularly if intended parents undergo several insemination efforts, they want access to more personal donor information than that contained in the standard catalog description, and/or they want rarer sperm

(e.g., "Doctorate Donor" sperm sold at a premium) [7]. Moreover, in most cases, intended parents pay these expenses out-of-pocket, as insurance plans do not often cover the cost of the sperm and the insemination procedure. Parties who use donor sperm, it follows, want a high-quality product and are mostly situated within the upper-middle class.

In part due to these associated costs, sperm banks recruit and sell gametes not only from donors who reflect the background of the patients who can afford these costs but also from donors who reflect idealized traits in society. Donors are more often white (as are the majority of patients who are able to pay for ART), and they are generally athletic, attractive, taller and leaner than average and display markers of intelligence (e.g., a college education, even if access to such education can reflect cultural values and social connections over biological attributes) [7]. Racial and ethnic minorities, the physically and mentally disabled, and—among others—men with only a high school education are sometimes vastly underrepresented among the donor pool. As Daniels writes, "while such practices may allow consumers to choose donors who mirror their own family traits, they are reminiscent of eugenic practices with historically subcategorized human value according to dominant class and racial hierarchies" [7].

Sperm donation collection practices are also exclusionary in that the vast majority of clinics prohibit gay and bisexual men from donating. This practice stems from a 2005 FDA guidance document recommending that cryobanks refuse to accept donations from "[m]en who have had sex with another man in the preceding 5 years," owing to the risk of transmitting HIV/AIDS and hepatitis B [16]. Sperm are routinely and thoroughly tested for both diseases by clinic staff—in compliance with FDA regulations, no less [17]. Donors even agree to undergo testing 6 months after their donation period has concluded and well before the clinic makes the sperm available for purchase. Yet, despite these safeguards and evidence that heterosexual transmission of these diseases is equally (if not more) concerning, clinics and government display a lingering, stigmatizing fear that gay and bisexual men present a unique threat [18]. While the National Institutes of Health (NIH) has recently expressed interest in researching the legitimacy of this practice, which is founded on the FDA's long-standing prohibition against gay and bisexual male blood donation, no change appears on the horizon [19, 20]. The policy and practice, thus, warrant more attention and scholarship; the very existence of federally mandated discrimination signals that the legal and ethical concerns have yet to be thoroughly addressed. Another topic that suggests the need for updated regulations is that of donor offspring numbers.

Consanguinity: Limiting the Number of Donor Offspring and Maintaining Quality Informed Consent

As long as the for-profit sperm donation industry has been in existence, practitioners and scholars have expressed concern about the number of offspring one donor (vis-à-vis his sperm) can produce. In Western Europe, this issue has generated debate for some time. Nearly every country within the region has passed regulations aimed at lessening the chance that donor offspring will unwittingly meet and have children with their biogenetical half, or even whole, siblings [21]. With these concerns in mind, regulations limit either the number of offspring per donor, the number of families a donor can aid, or the number of times one donor's samples can be used before clinics (i.e., if a donor has worked with more than one) retire the sperm [22]. And, over time, such regulations have become an insurance system of sorts for parents of donor offspring and the government in these countries.

In the USA, however, the issue of donor offspring has lingered on the back burner. Here, the free-market system has proven more resistant to industry regulations, and strong liberal values have created a culture in which governmental attempts to regulate citizens' right to reproduce have historically met overwhelming constitutional challenges and today remain wildly unpopular [23]. Yet, some effort to regulate and monitor

this matter has appeared. ASRM has issued guidelines limiting donor offspring to 25 in a population of 800,000 [24]. Additionally, in 2000, the Donor Sibling Registry (DSR) emerged, offering an online database meant to assist families in researching half-siblings. The Web site not only allows donors and families a way to research their biogenetic relations, but it also keeps a running total of (registered) offspring stemming from particular donor identification numbers—the only source currently engaged in this project. Yet these efforts prove incomplete. Clinic adherence to the ASRM guidelines is voluntary, and the DSR only tracks offspring who self-register; it does not keep track of all donor offspring statistics. In addition to Americans remaining wary of laws governing their intimate lives, then, paper-tiger practitioner guidelines and purely voluntary efforts have left a void in the monitoring of donor offspring numbers.

Recently, however, the need for more effective regulation has sparked concern among medical and ethical experts, donors, and parents. It began with a *New York Times* article that gave traction to a reproductive urban legend of sorts when it reported that sperm from one donor alone had produced 150 biogenetic half-siblings [25]. In identifying causes, the article pointed to the fact that cryobanks have a tendency to lowball the number of estimated half-siblings—with both intended parents and potential donors alike—to generate interest in their particular clinic and in donation generally. One sperm donor, for example, reportedly learned from clinic staff that donors rarely produce over ten offspring, despite evidence that donors are at times producing far more [25]. Whether clinics actually underrepresent their results purposefully (higher offspring numbers may scare off both potential donors and intended parents), their statistics remain hindered by a lack of regulation. Clinic staff indeed ask parents to inform them of any births that result from their donor sperm, but such data rely on volunteerism and families often fail to report back [26]. The argument follows: so long as regulations fail to mandate reporting and set limits on offspring, accurate averages will remain unknown.

In addition to the public health concern of consanguinity, the lack of accurate data regarding offspring birthrates also raises ethical concerns pertaining to informed consent. If clinics utilize flawed data in their consenting practices, yet continue to procure and engage donors in the medical act of donating gametes, whether donors are fully informed before they consent to donate remains unlikely. Likewise, if clinics downplay the potential number of biogenetic half-siblings donor sperm can produce to intended parents, many such parents may not be fully informed when they consent to employ donor sperm in their insemination attempts.

Of course, the degree to which the ethics community should make hay over this issue depends on how it chooses to define informed consent: if, to be fully informed, consenting parties need to know all relevant information—beyond the actual medical risks and benefits—to be informed, the regulation and monitoring of offspring statistics constitutes a legitimate concern. Under this framework, both donors and intended parents deserve to know how many offspring could actually result before deciding whether or not to donate or use donated sperm. Alternatively, under a more narrow definition, if informed consent requires communicating the medical risks and benefits only, the issue of donor offspring may not warrant the reaction it has recently generated; that is, donors and intended parents would have no ethical reason to require reliable statistics before consenting.

The dilemma also hinges on whether informed consent constitutes a subjective or objective standard. Do donors and intended parents need to consider their consent fully informed for it to actually be "fully informed," or would an objective definition of what constitutes "informed" suffice? The former option will no doubt require more data—and, it follows, may necessitate regulation and monitoring to ensure that accurate statistics regarding offspring rates exist. The latter, on the other hand, may allow clinics to impart far less information, without formal regulation and monitoring (something close to the laws and clinic practices as they exist today). Currently, this dilemma remains unsolved,

partially because informed consent itself constitutes as an evolving concept and partially because of the cultural resistance to regulation previously mentioned [27]. As the voices of parents and donors grow louder, however, the momentum for change may prove difficult to ignore, and a rounded bioethics position on the matter will provide much-needed guidance.

Disclosure and Anonymity: Whether and What to Tell Offspring

Another grouping of issues that has generated significant interest and scholarship pertaining to sperm donation practices is whether, and to what extent, donor offspring should learn of their lineage and whether clinics and government should play a role in supporting the transmission of this information. Similar to the regulation of offspring rates of third-party reproduction, the matter of disclosure and the related issue of donor anonymity have fueled ethical and legislative change in certain parts of the world [28]. In the USA, however, this has not been the case, owing to the overwhelming laissez-faire character of the free market, and claims based on reproductive privacy rights that parents—and only parents—should decide whether and how to inform their children of their biological origins [29]. Furthermore, fears that removing anonymity from sperm donation will ultimately lessen donor interest and reduce the available supply have also slowed any evolution in the USA toward making donation a potentially open-identity endeavor [6].

Currently, the prevailing position in the Western world is that parents should tell children they were conceived with donor gametes [30]. ASRM, for example, advocates disclosure based on individuals' fundamental interest (and potential legal right) in knowing their genetic heritage and the importance of their ability to make informed healthcare decisions in the future [31]. Some argue that nondisclosure violates the autonomy of offspring [32]. Many reference the trend among adoptive parents who disclose the adoption to their children as a parallel circumstance and evidence that such disclosures do not inherently harm, and may benefit, children [24, 33, 34]. Moreover, studies indicate that parents can further minimize harm to their children by telling them earlier rather than later—and surveys show that, at least among single and lesbian mothers, disclosure rates indeed follow this pattern [35, 36]. Revealing records of donors' genetic and medical health, or even their donor identification number, is one thing, however; whether clinics, government, and parents should make donors' personal identities available to offspring shifts the debate significantly, and disagreement becomes the norm rather than the exception.

Little consensus exists on the issue of whether donor anonymity should fade out as a practice, and open-identity donation become the standard donor policy. Several European countries and Australian states have mandated open-identity donation, ensuring that offspring will have access to their donor's personal identity should they decide to obtain it [37]. Sweden, for example, prohibited anonymous sperm donation in 1985, and both Norway and the UK did the same 20 years later [38, 39]. This reflects, a percolating trend in the Western world to legislatively prioritize offspring rights to access their biogenetic history as well as to seek out the source of that history [40]. Moreover, recent scholarship suggests not only that this approach benefits donor offspring but that most donor offspring want greater openness with donors [8, 37, 41].

Opponents of abolishing anonymous donation argue that the unintentional consequences that result from this policy change will outweigh the benefit that may come to offspring. While some focus on donor altruism, and others on donor financial motivations, they share in arguing that removing the firewalls protecting donor identity will discourage potential donors and ultimately reduce the amount of donor samples [6, 39, 42]. One scholar even highlights the reproductive traveling that has necessarily emerged from the shortage of donor sperm in Sweden [43].

Some scholarship falls in the middle. In an effort to bridge these two policy perspectives, some scholars have looked to what they call a

"double track" approach that accommodates donors and intended parents who wish to avoid personal identity disclosure and also those who hope to donate and reproduce under an open system [44]. While many clinics currently do this already and (it should be noted) charge a premium for the additional information, such scholars propose that cryobanks could systematically offer both options. Under such a system, they propose, recruiting semen donors who accept the open terms is not an impossibility; the open system will simply attract different kinds of men [45].

Other scholars have astutely pointed to the potential mootness of the debate in its entirety. Two legal scholars, Dawn Swink and J. Brad Reich, discuss how technology may eventually make donor privacy obsolete [46]. They open their article discussing a 15-year-old boy who recently tracked down his genetic father, a sperm donor, by using a DNA-testing service. While his method required some ingenuity, as another scholar writes, "any internet-savvy teenager with a few 100 dollars could likely make the same discovery" [6]. Similarly, Vanessa Pi, another legal scholar, argues that in the absence of legislation, court decisions might also make donor and birth parent expectations of privacy irrelevant—at least when the information could reasonably help donor offspring obtain proper medical care [6].

If these voices from outside the traditional bioethics community are right, practitioners and policy experts will need to update their ethical frameworks in preparation for the slow dismantling of exclusively anonymous donation practices. It will behoove the community to revisit informed consent policies and materials, in particular. Even if clinics do not themselves disclose personal identity (or they do so under court order), making donors and intended parents aware that their privacy interests may not in all circumstances remain protected will enhance clinical communication. Moreover, in contrast to arguments that no ethical model accounts for all parties' interests, this approach may at least pragmatically prepare all parties for the future [47].

Genetic Disease: How to Prevent Transmission, Support Patients' Rights, and Avoid Neo-eugenics Policies and Practices

To prepare for the future also requires considering the impact genetic information will have on donation models and practices. Currently, clinics test for genetic disease on a voluntary basis, as the FDA's interest in infectious agents has eclipsed any regulation of heritable disease. While ASRM and SART jointly issued guidelines for cryobanks, only half of all US sperm banks report conducting any chromosomal analysis—and most of those do not follow the association's screening protocols [48]. Within this context, academic scholarship and investigative journalism have revealed the devastating effects *not* testing for known genetic diseases can have on families.

The data reveal that current genetic testing practices are insufficient, can lead to avoidable illness and death among donor offspring, and that, as our knowledge of genetic medicine expands, the infertility field's under-preparedness will only become more egregious. One study focusing on hypertrophic cardiomyopathy (HCM) revealed how an asymptomatic 23-year-old sperm donor inadvertently transmitted the autosomal dominant disease to 6 of the 24 offspring resulting from his 2-year contract with one US sperm bank—and that one child died from the condition at the age of 2 [49, 50]. The authors, Maron et al., describe how the donor only discovered he had the genetic mutation when one of the offspring tested positive after presenting with physical symptoms and, through a novel reverse information-sharing chain, became notified of his genotype. Studies also reveal that autosomal recessive disorders, such as cystic fibrosis and Tay-Sachs, can cause avoidable harm to donor offspring [51, 52]. Such diseases present a more complicated scenario in that the genetic mother must also be a carrier for the genotype to emerge as phenotype, but advocates and scholars have called for action in both instances. What sort of action, however, remains in dispute.

Medical and ethical experts, parents, and advocates differ on what sort of changes to sperm donation screening practices need to occur, but they all agree that clinics must implement policy and pragmatic adjustments—and that these may require a mandate if the current low compliance rate with ASRM/SART's guidelines provides any insight into the likelihood of voluntary action [48]. Many, such as Wendy Kramer, the DSR cofounder, call for comprehensive and widespread genetic testing of donors, maintaining the additional cost of a couple-100 dollars will only enhance third-party reproduction [52]. Others call for disease-specific genetic testing for the more common disorders, such as fragile X premutation [53]. Maron et al. call for a more moderate approach. They maintain that conducting genetic testing on every donor for every known autosomal dominant disorder will likely be cost prohibitive and reduce access of financially marginal parties to ART [49]. They recommend adopting a more rigorous screening protocol (such as electrocardiograms, or EKGs, which reveal HCM in the majority of cases) and establishing a registry that informs all parties—donors and recipient—of genetic diseases when diagnoses are made [49]. While they do not rule out the need for genetic testing, Maron et al. call for it only when screenings indicate that it is prudent. In addition to these three positions, ASRM and SART's joint guidelines for gamete donation call upon clinics to at least obtain a family history that may indicate an elevated risk of genetic disease [54]. Lastly, at a minimum, authors who write about the information gap emphasize the need for clinics to communicate to intended parents whether and what screenings and/or testing they do perform on donors, as this information falls squarely within the best interests of recipients [51].

While such work highlighting what Maron et al. call an "underrecognized [sic] public health issue" draws attention to the problem, the lack of agreement regarding solutions does not lend itself to systemic change [49]. Experts will have to consider the alternatives that not only work best for particular diseases but what works best in a dynamic and evolving genetic setting. Maron et al.'s solution for HCM screening, for instance, certainly offers hope for reducing the transmission of HCM and other similarly manifesting diseases. But screening does little for genetic disorders that do not reveal themselves physiologically and cannot, therefore, be detected with other technologies (such as an EKG) at the time of donation [53, 55]. ASRM and SART's family history screening recommendation does little for genetic diseases that do not appear obvious in one's family medical history, as Tay-Sachs does among the Ashkenazi Jewish population [54]. Fragile X premutation and HCM both fall into this category that clinicians would not likely detect with a family history alone [49, 53].

When change does occur, as others have suggested, it may necessitate governmental oversight, such as an expansion of the FDA's current role [49]. The complexity created by the variance among diseases combined with resistance to screen or test among cryobanks currently subscribing to the position that "human reproduction is an inherently risky proposition" and even the most advanced genetic testing offers no guarantees makes for a large undertaking [52]. But without more agreement on solutions, change will be slow, and it may require genetic medicine's furthered centrality to medicine writ large—a cultural change, so to speak.

As this change occurs, experts will need to balance their efforts at reducing the transmission of disease with parties' ethical, and perhaps legal, right to remain ignorant of one's genotype. A long-standing issue in bioethics, the "right not to know," has become central to genetic medicine in that genetic diagnoses have the power to make real an otherwise asymptomatic disease [56]. Many individuals want to learn of their genetic predisposition to certain conditions, but others with a family history and the potential to possess chromosomal mutations have opted to forego testing, fearing their diagnosis may negatively affect their quality of life and both their insurance and employment options, despite the Affordable Care Act's protection of preexisting conditions, and their right to seek legal remedies under the Genetic Information Nondiscrimination Act. This decision is particularly common if no effective treatments or cure for the disease exists, as is the

case with—for example—Huntington's and CADASIL syndrome [57].

The "right not to know" will become more central to third-party reproduction in the future. If, for instance, a governing body establishes a registry, such as the one Maron et al. propose, experts will not only have to maximize the registry's effectiveness but also protect parties' right to avoid learning of their predisposition. Whether effectiveness will require mandated registry participation, and whether parties choosing to remain uninformed of their own condition may register to disclose diagnoses only—these are the concerns that will percolate in the years to come. Similarly, how clinical practices will respect potential donors' "right not to know," particularly if screening or testing indicates they are ineligible to donate, must receive further consideration.

Another salient, and reappearing, issue that medical and bioethics experts will necessarily address in the context of genetic medicine is whether preventing disorders constitutes a neo-eugenics undertaking. Historically minded scholars caution practitioners and policymakers in genetics to consider the ramifications of preventing genotypes and their associated phenotypes from the population that uses donor sperm [15]. Practices that screen and ultimately make carriers ineligible for donation, if undertaken broadly, may—by reducing the number afflicted—not only lessen the amount of research done to help that population, but it may increase the stigma of having such a condition.

The intersection of genetic medicine and third-party reproduction means that experts will face all of these issues and will need to identify lasting solutions. Moreover, this must happen sooner rather than later; if governing bodies implement substandard—or no—solutions, courts are likely to step in and create case law to solve the outstanding problems. Indeed, the legal liability of donors who (even inadvertently) pass on genetic disease already constitutes a much-discussed topic in the literature. Legal scholars have proposed that where administrative and executive law does not intervene, the judiciary will [58].

Conclusion

The debates regarding the ethics of sperm donation policies and practices reveal that much work remains to be done for scholars and practitioners. The discussions expose how current standards and regulations in the USA are, at times, deeply flawed and fail to prevent harm to the parties whose lives they affect. Moreover, the literature on each topic convincingly argues that the industry would benefit from updated regulations, if not increased governmental oversight.

In many cases, solutions will appear daunting; the topic of compensation rates, and their effects, presents one of these. In an industry driven primarily by free-market principles, compensation rates blur the fact that donors are donating—as opposed to selling—their gametes. The supply–demand cycle that such rates help to maintain encourages exclusionary and discriminatory practices. This long-standing issue smacks of our eugenic past in that clinics essentially send biological—even social—traits to the market. Yet solutions evade grasp owing to the fact that harm gets dispersed among large social groups, and the problems are so systemic to the capitalist healthcare model. But not all exclusionary practices lay beyond reach. More work can be done on the matter of discrimination against gay and bisexual men. Updated studies have the potential to counter scientific evidence and destabilize the cultural narrative that "men who have sex with other men" inherently pose a higher risk.

Another problem begging for change centers on the lack of oversight over offspring numbers. While the threat of consanguinity may not appear like a true threat in our highly mobile world, for those whose lives current practices impact, it is. Moreover, this may be one of the easier problems to solve. Other countries have tackled the problem without much controversy, and their regulations exist as a viable model for change in the future. While experts will necessarily tackle claims to reproductive privacy, fresh scholarship can explore how solutions (e.g., coded registries) do not stand to threaten the negative right to be left alone.

As scholars tackle the growing issue of disclosure and donor anonymity, they will also run aground liberal claims of reproductive privacy. However, just as other countries in the Western world have successfully negotiated solutions that support offspring rights to know their biogenetic origins, the USA can too. Thoughtful alternatives, such as the "double track" framework, will prove this to be true in the years to come. Our increasingly complex understanding of disease and the body will only make knowing one's family medical history that much more important.

Similarly, in this new medical world of "personalized medicine," the transmission of genetic disease will only become a more visible problem in years to come—and a lack of solutions will appear that much more egregious. While scholarship today, in its devotion to particular diseases, remains divided, future work will retheorize the evidence and draw cost-effective solutions. In this process, they will address how to respect patient rights "not to know" and, ideally, avoid repeating our eugenic past.

Government should play a role in each of these, for interstate commerce evades state regulations, and professional organizations have a limited influence. The expanded role will allow forward-thinking policy and practice changes to solve industry-wide problems before parties with legal claims seek intervention by the courts, and case law creates a patchwork of ad hoc regulations. Particularly because such judicial regulations will prioritize law over ethics—and often the two make poor bedfellows—the bioethics community has a responsibility to act.

References

1. Gregoire AT, Mayer RC. The impregnators. Fertil Steril. 1964;16:130–4.
2. Gosden R. Cryopreservation: a cold look at technology for fertility preservation. Fertil Steril. 2011;96(2):264–8.
3. Lerner KL, Lerner BW. Medicine, health, and bioethics: essential primary sources. Detroit: Thomson/Gale; 2006.
4. CBS News. Sperm: America's most renewable resource? 2012 April 5. Available from: http://www.cbsnews.com/8301-505269_162-57409735/sperm-americas-most-renewable-resource/
5. 21 C.F.R. § 1271.1.
6. Pi VL. Regulating sperm donation: why requiring exposed donation is not the answer. Duke J Gender Law & Policy. 2009. Available from: http://scholarship.law.duke.edu/djglp/vol16/iss2/7
7. Daniels CR. Marketing masculinity: bioethics and sperm banking practices in the United States. In: Freeman M, editor. Law and bioethics. Oxford: Oxford University Press; 2008. p. 213–24.
8. Jadva V, Freeman T, Kramer W, Golombok S. Sperm and oocyte donors' experiences of anonymous donation and subsequent contact with their donor offspring. Hum Reprod. 2011;26(3):638–45.
9. 42 U.S.C. § 274(e).
10. Newton-Small J. Frozen assets. Time Magazine. 2012 April 5. Available from: http://www.time.com/time/magazine/article/0,9171,2111234-1,00.html
11. Iammarrone E, Balet R, Lower AM, Gillott C, Grudzinskas JG. Male infertility. Best Pract Res Clin Obstet Gynaecol. 2003;17(2):211–29.
12. *Doornbos v. Doornbos*, 23 U.S.L.W. 2308. (Super. Ct. Cook County, Ill., 1954)
13. Lisee, C. Sperm donation: conservatives line up against sperm donors, but lack the power to ban them. Religion News Service. 2012 June 27. Available from: http://www.washingtonpost.com/national/on-faith/conservatives-line-up-against-sperm-donors-but-lack-the-power-to-ban-them/2012/06/27/gJQAgXDV7V_story.html
14. Almeling R. Selling genes, selling gender: egg agencies, sperm banks, and the medical market in genetic material. Am Sociol Rev. 2007;72(3):319–40.
15. Hanson FA. Donor insemination: eugenic and feminist implications. Med Anthropol Q. 2001;15(3):287–311.
16. Food and Drug Administration, Center for Biologics and Evaluation Research. Guidance document: eligibility determination for donors of human cells, tissue, and cellular and tissue and tissue-based products (HCT/Ps). 2007 August. Available from: http://www.fda.gov/downloads/BiologicsBloodVaccines/GuidanceComplianceRegulatoryInformation/Guidances/Tissue/ucm091345.pdf
17. 21 C.F.R. § 1271.85(d).
18. Ferguson D. FDA trying to ban gay men as sperm donors. The Raw Story. 2012 August 24. Available from: http://www.rawstory.com/rs/2012/08/24/fda-trying-to-ban-gay-men-as-sperm-donors/.
19. Lambda Legal. Letter to the National Heart, Lung, and Blood Institute. 2012 April 23. Available from: http://www.lambdalegal.org/sites/default/files/ltr_nhlbi_20120223_comments-re-blood-donation-policy-for-msm.pdf.
20. Bensing DJ. Science or stigma: potential challenges to the FDA's ban on gay blood. J Const Law. 2011;14(2):485–510.
21. Dicken CL, Zapantis A, Illions E, Pollack S, Lieman HJ, Befilacqua K, et al. Full-sibling embryos created by anonymous gamete donation in unrelated recipients. Fertil Steril. 2011;96(3):641–2.
22. Sawyer N. Sperm donor limits that control for the 'relative risk' associated with the use of open-identity donation. Hum Reprod. 2010;25(5):1089–96.

23. *Skinner v. Oklahoma*, 316 U.S. 535 (1942). *Griswold v. Connecticut*, 381 U.S. 479 (1965).
24. The Practice Committee of the American Society for Reproductive Medicine. Repetitive oocyte donation. Fertil Steril. 2008;90(3):S194–5.
25. Mroz J. One sperm donor, 150 offspring. New York Times. 2011 September 5. Available from: http://www.nytimes.com/2011/09/06/health/06donor.html?pagewanted=all
26. Ottey M, Seitz S. American Society for Reproductive Medicine. Trends in donor sperm purchasing, disclosure of donor origins to offspring, and the effects of sexual orientation and relationship status on choice of donor category: a three year study. Fertil Steril. 2011; 96(3):S268.
27. Audrey S. Qualitative research in evidence-based medicine: improving decision-making and participation in randomized controlled trials of cancer treatments. Palliative Med. 2011;25(8):758–65.
28. Jørgensen HK, Hartling OJ. Anonymity in connection with sperm donation. Med Law. 2007;26(1):137–43.
29. American Society for Reproductive Medicine Office of Public Affairs. Press release. 2011 October 19.
30. Kirkman M. Parents' contributions to the narrative identity of offspring of donor-assisted conception. Soc Sci Med. 2003;57(11):2229–42.
31. Ethics Committee of the American Society for Reproductive Medicine. Informing offspring of their conception by gamete donation. Fertil Steril. 2004; 81(3):527–31.
32. McGee G, Brakman SV, Gurmankin AD. Gamete donation and autonomy: disclosure to children conceived with donor gametes should not be optional. Hum Reprod. 2001;16:2033–8.
33. Lifton B. Journey of the adoptive self: a quest for wholeness. New York: Basic Books; 1994.
34. Brodzinsky D, Smith D, Brodzinsky A. Children's adjustment to adoption: developmental and clinical issues. London: Sage Publications; 1998.
35. Vasanti J, Freeman T, Kramer W, Golombok S. The experiences of adolescents and adults conceived by sperm donation: comparisons by age of disclosure and family type. Hum Reprod. 2009;24(8):1909–19.
36. Beeson DR, Jennings PK, Kramer W. Offspring searching for their sperm donors: how family type shapes the process. Hum Reprod. 2011;26(9):2415–24.
37. Frith L. Gamete donation and anonymity: the ethical and legal debate. Hum Reprod. 2001;16:818–24.
38. Ernst E, Ingerslev HJ, Schou O, Stoltenberg M. Attitudes among sperm donors in 1992 and 2002: a Danish questionnaire survey. Acta Obstet Gyn Scan. 2010;86(3):327–33.
39. Blyth E, Frith L. The UK's gamete donor 'crisis'—a critical analysis. Crit Soc Pol. 2008;28(1):74–95.
40. Isaksson S, Svanberg AS, Karlstrm PO, Sydsjo G, Thurin-Kjellberg A, Solensten NG, et al. Two decades after legislation on identifiable donors in Sweden: are recipient couples ready to be open about using gamete donation? Hum Reprod. 2011;26(4):853–60.
41. Mahlstedt PP, Labounty KR, Kennedy WT. The voices of adult offspring of sperm donation: forces for change within assisted reproductive technology in the United States. Fertil Steril. 2008;90(1):S178.
42. Guido P. The reduction of sperm donor candidates due to the abolition of the anonymity rule: analysis of an argument. J Assist Reprod Genet. 2001;18(11): 617–22.
43. Ekerhovd E, Werner C, Faurskov A. Swedish sperm donors are driven by altruism, but shortage of sperm donors leads to reproductive traveling. Upsala J Med Sci. 2008;113(3):305–13.
44. Eitan-Schiller Y, Seidman DS. Sperm or oocyte donation: the dynamics of making the decision regarding the method and timing of disclosure of information to the sibling. Harefuah. 2009;148(4):251–5. 275.
45. Daniels K. Anonymity and openness and the recruitment of gamete donors. Part I: semen donors. Hum Fertil. 2007;10(3):151–8.
46. Swink D, Reich J. Caveat vendor: potential progeny, paternity, and product liability online. Brigham Young U Law Rev. 2007;2007(4):857–98.
47. Burr J, Reynolds P. Thinking ethically about genetic inheritance: liberal rights, communitarianism and the right to privacy for parents of donor insemination children. J Med Ethics. 2008;34(4):281–4.
48. Daar JF, Brzyski RG. Genetic screening of sperm and oocyte donors: ethical and policy implications. JAMA. 2009;302(15):1702–4.
49. Maron BJ, Lesser JR, Schiller NB, Harris KM, Brown C, Rehm HL. Implications of hypertrophic cardiomyopathy transmitted by sperm donation. JAMA. 2009; 302(15):1681–4.
50. Incorrect total shown for number of tested offspring in: implications of hypertrophic cardiomyopathy transmitted by sperm donation. JAMA. 2009;302(18):1972.
51. Sims C, Callum P, Ray M, Iger J, Falk R. Genetic testing of sperm donors: survey of current practices. Fertil Steril. 2010;94(1):126–9.
52. Mroz J. In choosing a sperm donor, a roll of the genetic dice. *New York Times*. 2012 May 14. Available from: http://www.nytimes.com/2012/05/15/health/in-sperm-banks-a-matrix-of-untested-genetic-diseases.html?_r=1&pagewanted=print
53. Wirojanan J, Angkustsiri K, Tassone F, Gane LW, Hagerman RJ. A girl with fragile X premutation from sperm donation. Am J Med Genet A. 2008;146(7): 888–92.
54. Practice Committee of American Society for Reproductive Medicine, and Practice Committee of Society for Assisted Reproductive Technology. Guidelines for gamete and embryo donation: a Practice Committee report. Fertil Steril. 2008;90(5):30–44.
55. Siffroi JP, Charron P, Bujan L. Heritable disease and sperm donation. JAMA. 2010;303(7):617.
56. Klitzman RL. Am I, my genes? confronting fate and family secrets in the age of genetic testing. Oxford: Oxford University Press; 2012.
57. Weaver KD. Genetic screening and the right not to know. Issues Law Med. 1997;13(3):243–81.
58. Jayanti SE. Guarantors of our genes: are egg donors liable for latent genetic disease? Am U Law Rev. 2008;58(2):405–57.

Part V

Posthumous Reproduction

Medical Aspects of Posthumous Reproduction

17

Christopher Brede and Edmund Sabanegh, Jr.

Introduction

Options for reproductive medicine continue to expand. The CDC reported an increase from 80,000 cycles of assisted reproductive technology (ART) per year in 1998 to over 140,000 cycles in 2007 [1]. ARTs have impacted the lives of countless individuals and couples with limited fertility potential. With this positive impact, ARTs have also opened the field to novel and, at times, unanticipated reproductive issues, including advanced maternal and paternal age, transgender pregnancy, and posthumous reproduction.

The earliest report of posthumous sperm procurement (PSP) was in 1980 and involved a young man in a motorcycle accident whose family requested sperm retrieval [2]. Requests were uncommon through the early 1990s but then started to gain popularity as a means of posthumous fertilization in the USA [3, 4]. One of the first successful perimortem sperm collections that led to pregnancy was performed in 1995 in the UK [5]. The patient, who was declared brain dead after complications from a motor-vehicle crash, and his wife, Diane Blood, had been attempting unsuccessfully to conceive with timed intercourse for 4 years. Rectal probe electroejaculation was employed for sperm retrieval before withdrawal of ventilator support. Ms. Blood was subsequently required to export the sperm to Belgium, as laws in the UK did not permit the use of gametes from the deceased for reproduction [6].

The first reported case of posthumous reproduction in the USA involved William Everett Kane, his girlfriend of 5 years, Deborah Ellen Hecht, and Kane's existing children [7]. After Kane's suicide, his children argued that his cryopreserved sperm should be destroyed in order to preserve a natural family unit. Despite their request, the courts allowed Hecht to use Kane's banked sperm for posthumous reproduction, because he had explicitly stated when initiating the cryopreservation process not only that he bequeathed his sperm to Hecht but also that it was his intent for her to bear his offspring after his death. This case highlights the importance of a written record of informed consent and advanced directive, which the courts often look for as proof of the deceased's intent [8].

With an increased use of PSP, unique and unforeseen issues have arisen. Most recently, several cases have gained interest on the legal front, with decisions being carried to the Supreme Court regarding the inheritance rights of posthumously conceived children [9]. The situations in which PSP arises may be diverse, and the practicing fertility specialist should be aware of the medical conditions, surgical techniques, ethical dilemmas, and legal aspects involved with these cases.

C. Brede • E. Sabanegh, Jr. (✉)
Department of Urology, Glickman Urological and Kidney Institute, Cleveland Clinic, 9500 Euclid Avenue, Q10, Cleveland, OH 44195, USA
e-mail: bredec@ccf.org; SABANEE@ccf.org

J.M. Goldfarb (ed.), *Third-Party Reproduction: A Comprehensive Guide*,
DOI 10.1007/978-1-4614-7169-1_17,

Indications

Posthumous reproduction is defined as the birth of a child after the death of at least one of the biologic parents. Posthumous gamete procurement refers to the harvesting of sperm or oocytes from a recently deceased person. PSP has been described extensively in the literature since the first case in 1980 and has been performed around the world.

The causes of death for individuals considered for PSP vary, most commonly involving motor-vehicle crashes, penetrating trauma, and also occasionally unexpected and sudden cardiac arrest, devastating neurological injury, and cancer [3]. The exact prevalence of postmortem sperm procurement is unknown. A survey conducted in 1995 of 268 reproductive centers in the USA and Canada showed an incidence of 82 requests over a 15-year period at 40 centers [3]. Of the requests, 25 of these were honored. More than half of the requests were made in the final year of the series, indicating an increasing trend in requests. In 2002 an updated study reported an additional 49 requests in the 7 years, an increase of 60 % of requests. Of these 49, 17 requests were honored, an increase of 64 % [4]. These numbers suggest that there was not only an increased demand for PSP but also an increased number of retrievals performed. Whether this increase in the rate granted is due to selection from a more appropriate pool of requests or from an increasingly tolerant legal or ethical system is unclear.

Cryopreservation

Cryopreservation plays an integral role in posthumous reproduction with the freezing of sperm, oocytes, and even embryos. Cryopreserved sperm are generally able to maintain consistent quality in liquid nitrogen for over 20 years, and prolonged storage does not seem to affect motility [10]. There can be untoward effects related to cryopreservation on sperm, including ice crystal formation, membrane impairment, mitochondrial damage, and controversy over changes in DNA integrity [11]. Success rates for embryo implantation and live pregnancy have been shown to be equal with intracytoplasmic sperm injection (ICSI) and cryopreserved sperm using sperm frozen from 3 to more than 24 months [12]. No studies exist detailing the long-term viability, morphology, or motility of spermatozoa cryopreserved after PSP. The landmark case of Diane Blood and the birth of her second child demonstrates the feasibility of perimortem sperm procurement and the ability to achieve a successful pregnancy with ICSI even after 7 years of sperm cryopreservation.

Guidelines

There are no standard national or international guidelines established for posthumous assisted reproduction. As detailed in the following section, a variety of respected groups have weighed in on the issue, and these statements may help guide the reproductive team toward appropriate patient counseling. In nearly all instances, a "bereavement" period of at least 6 months from the time of death to the point at which the sperm are available for fertilization is recommended. This allows for the normal grieving process, psychological adjustment, and counseling to occur. And while no consensus exists in the USA, there has been an increase in the number of available protocols for PSP, up to 21 as of 2002 [4].

The American Society for Reproductive Medicine's (ASRM) Ethics Committee has published a statement regarding posthumous reproduction [13]. One of the ASRM's recommendations is honoring the wishes of the deceased donor regarding the use of his gametes for posthumous conception. Without explicit consent from the deceased, a physician is not obligated to comply with the wishes of the surviving spouse, parent, or any other third-party decision maker. As such, if the donor wishes to have gametes used after death, these wishes should have been made clear prior to death. This is somewhat analogous to an advanced directive, in that a donor provides instructions for his or her medical care in the event that they are medically

incapacitated and unable to communicate their wishes. Therefore, at the time of cryopreservation, reproductive clinics have been urged to make patients declare what they want done with the gametes after death.

The Mayo Clinic published institutional guidelines for posthumous gamete collection [14]. While in good health, the patient must express, in writing, the desire for posthumous reproduction, collection must not entail unusual risk, and the patient's surrogate medical decision maker must consent to the procedure and arrange for long-term storage of the gametes. In turn, the statement notes that the institution performing the gamete procurement must comply with federal regulatory issues, including infectious disease testing, provide legal confirmation of the procedure, and provide an Ethics Consultation Service for families and caregivers. Such institutional-specific guidelines serve as rational medical and ethical groundwork for caregivers, patients, and families.

The European Society of Human Reproduction and Embryology Task Force on Ethics and Law recently published a directive on posthumous reproduction [15]. Although similar to the American statement, the European statement includes several specific stipulations. Perimortem gamete retrieval (which, along with postmortem retrieval, includes patients in a persistent vegetative state or prolonged medically induced coma) cannot be performed in the absence of informed consent. This precludes last-minute decisions without adequate counseling and premeditation.

As discussed later in this chapter, the inheritance rights of posthumously conceived children are not well defined. The European statement addresses the rights of children born after posthumous reproduction, stating, "It is unfair that a child conceived after a parent's death would have fewer rights than its earlier born sibling" [15]. Furthermore, the committee encourages counseling prior to gamete utilization to make the surviving spouse aware of potential psychological issues both for the spouse and the future child. A minimum waiting period for bereavement of 1 year should be observed to prevent hasty decisions that could place an unfair burden of "replacing" the spouse on the new child. The European Society did not comment on use of gametes by individuals other than the surviving spouse, such as a parent or non-married couple.

The effects of implementing formalized guidelines for PSP have been studied at a single institution in the USA [16]. The study required that the deceased must (1) have provided evidence of intended paternity and consent from the wife as next-of-kin, (2) be without medical contraindications or death from communicable diseases, (3) have available resources and personnel to perform the procedure and bank the sperm, and (4) undergo a 1-year bereavement period. Of 22 requests for PSP during the study period, four men fit the institution's criteria for PSP. The authors concluded that implementing PSP exclusion criteria dramatically reduced the number of procurement performed and allows for adequate time before ART is attempted.

Surgical Techniques

Timing of sperm retrieval is crucial for the future success of any possible ART. A patient whose cardiopulmonary function is being medically or mechanically supported should ideally have sperm extracted while still supported, as tissue quality is thought to deteriorate in warm, unperfused tissue. In the event that support is withdrawn before the decision is made to retrieve sperm, or for patients who suffer cardiac death, the maximal time period for extraction is unknown. Viable sperm have been retrieved in the postmortem period up to 36 h after death, and the absolute outer time limit has not been established [17]. However, sooner is thought to be better, as most groups conclude that sperm quality is most favorable when retrieved within 24 h of death, although little is known regarding the specific changes of sperm parameters [16, 18].

The technique used for posthumous sperm retrieval depends on the clinical situation of the donor. Techniques vary in complexity and surgical invasiveness from percutaneous needle aspirations to more involved surgical methods as described below. The technique selected depends on the patient's underlying clinical situation and the surgeon's experience. With the availability of ICSI,

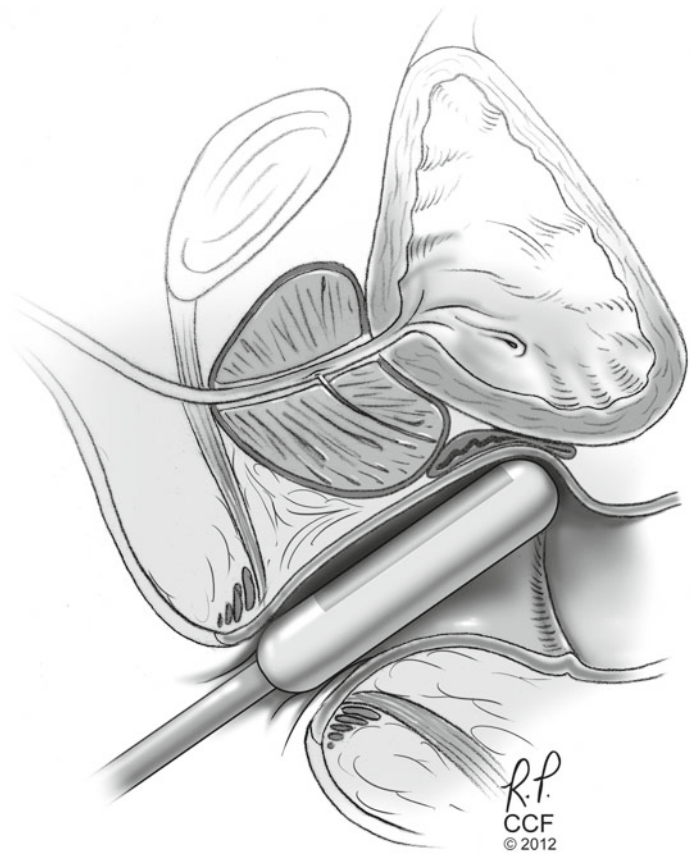

Fig. 17.1 Rectal probe electroejaculation. Probe electrodes face anteriorly so as to stimulate the pelvic nerves (Reprinted with permission, Cleveland Clinic Center for Medical Art & Photography © 2012. All Rights Reserved)

few viable sperm are actually needed to achieve fertilization, obviating the need for the more radical harvesting procedures of the past.

Excisional Procedures

One of the earliest postmortem sperm-retrieval techniques described involved a transabdominal and scrotal excision of the vas, epididymis, and seminal vesicles immediately after the patient underwent solid organ procurement [2]. An incision was made over the posterior aspect of the prostatic fascia, exposing the pelvic vasa, ampullae, and seminal vesicles. A bilateral vaso-seminal vesiculectomy was performed, and the contents placed in preservative. A scrotal approach was also taken to expose the testes and epididymides. The epididymides were excised from the efferent ductules to the convoluted vas deferens. This vasal segment was flushed, and the fluid examined for motile sperm. The epididymal fascia was incised to expose the epididymal tubules which are also examined for motile sperm, which were then cryopreserved. Several years later, Shefi et al. described another excisional procedure involving en bloc orchiectomy with epididymectomy and vasal sperm aspiration, orchiectomy with epididymectomy, and epididymectomy alone [17]. These techniques involved extensive dissection and time, which may be unnecessary to achieve the desired goal of viable germ cell retrieval, and have largely been replaced by less invasive procedures, which allow adequate sperm procurement for fertilization with ICSI.

Electroejaculation

Electroejaculation involves electrical stimulation of pelvic nerves via a rectal probe in order to stimulate seminal emission, which is expelled from the urethral meatus without contraction of striated muscles (Fig. 17.1). Electroejaculation

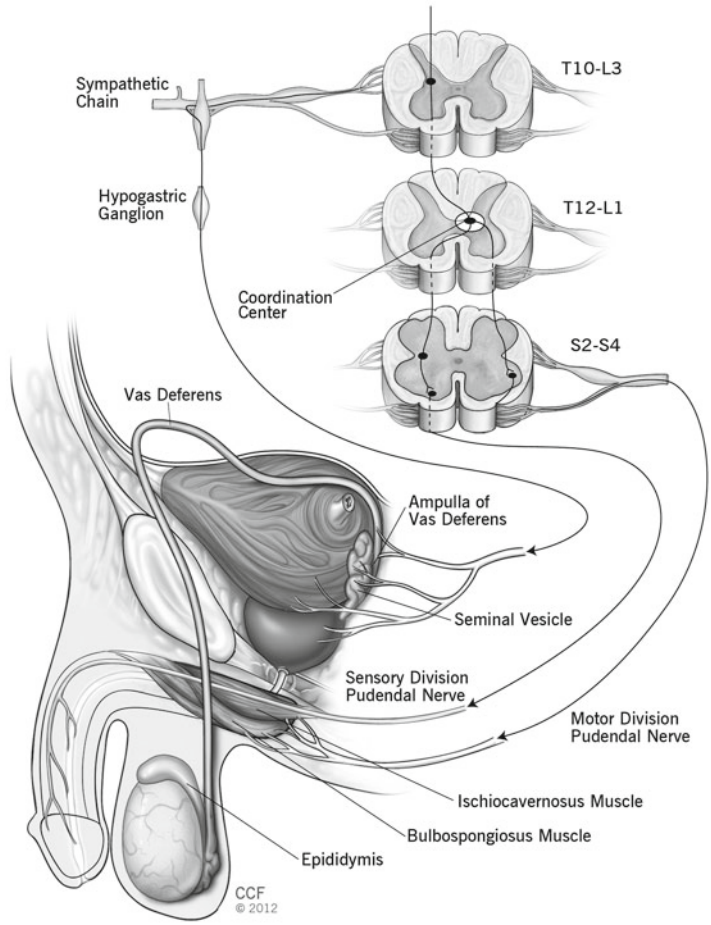

Fig. 17.2 Ejaculatory spinal reflex. A rectal probe stimulates the postsynaptic adrenergic neuronal fibers of the seminal vesicles, vasal ampullae, and prostate. Control of emission of seminal fluid along with closure of the bladder neck is mediated by the ejaculatory reflex center in the cord at T12 (Reprinted with permission, Cleveland Clinic Center for Medical Art & Photography © 2012. All Rights Reserved)

has been successfully employed for decades for sperm retrieval in anejaculatory humans who have spinal cord injuries or damage to the pelvic (S2–4) and thoracic (T11–L2) nerves responsible for the ejaculatory reflex arc (Fig. 17.2) [19]. For the neurologically unresponsive patient that has been declared brain dead, electroejaculation may be considered as a means of PSP and was reported by Townsend in 1995 [5] and subsequently described by several other groups [20–22].

Prior to inserting the rectal probe, several preparatory steps are necessary to optimize results. The bladder is drained with a straight catheter and the distal rectosigmoid is flushed clean if stool is present. This allows for optimal electrode-rectal wall contact. A buffer solution, such as Tyrode's solution, is instilled into the bladder. The probe is inserted into the rectum with the electrodes facing anteriorly on the rectal wall in order to contact the pelvic nerves. Sine wave stimulation is performed with progressively increased voltage to stimulate seminal emission. The temperature of the probe is monitored throughout the procedure. The urethra is milked and fluid collected. A urethral catheter is inserted, and the bladder rinsed with a buffer solution. Both specimens are processed and cryopreserved for subsequent ART. At present time there is no literature regarding the use of electroejaculation after cessation of cardiac function, and it is believed to have limited success [23].

Vasal or Epididymal Irrigation

This technique is, in general, similar to the widely utilized no-scalpel vasectomy technique and, as such, offers the advantages of minimal

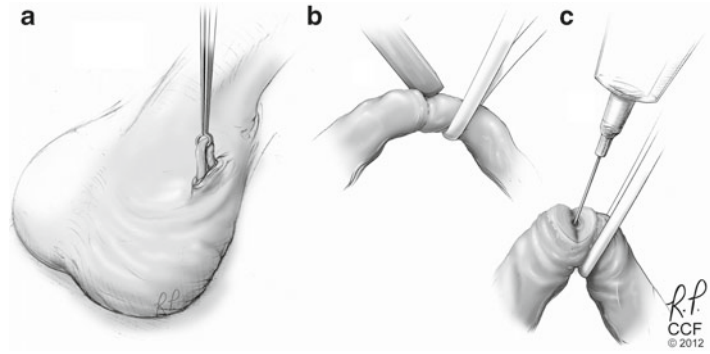

Fig. 17.3 Vasal sperm irrigation and aspiration. Similar to the no-scalpel vasectomy, the vas is isolated with a ring clamp, a hemi-vasotomy performed, and the lumen irrigated and vasal and epididymal fluid retrieved (Reprinted with permission, Cleveland Clinic Center for Medical Art & Photography © 2012. All Rights Reserved)

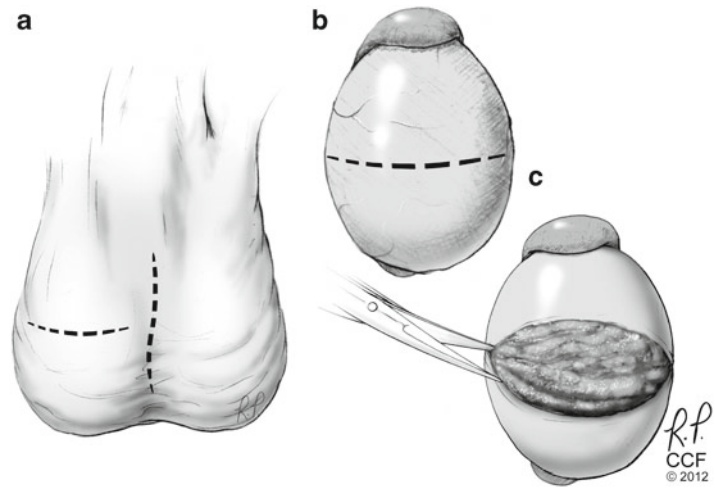

Fig. 17.4 Testicular sperm extraction. The testis is isolated and dissection carried down through the tunica albuginea. The seminiferous tubules are expressed and excised with fine scissors (Reprinted with permission, Cleveland Clinic Center for Medical Art & Photography © 2012. All Rights Reserved)

operative time and dissection (Fig. 17.3) [24]. With the body of the individual supine, the right or left vas deferens is manipulated so that it is immediately palpable under the scrotal skin. A ring clamp is used to grasp the vas. The skin is punctured with a sharp hemostat clamp, and the surrounding tissues on the vas are bluntly freed. A hemi-vasotomy incision is made with a 15° ultrasharp knife. An angiocatheter is inserted into the vasal lumen and irrigated with 0.1 cc of human tubal fluid medium while compressing the vas around the angiocatheter to prevent leakage. The epididymis is then compressed and proximal vasal fluid is retrieved for cryopreservation. An alternative percutaneous epididymal aspiration technique is performed with a 23-gauge angiocatheter inserted into the epididymis and the fluid aspirated [25]. Vasal aspiration offers the advantage of avoidance of contact with testicular or epididymal tissue, which undergo postmortem decomposition at a more rapid rate as compared to the vasal fluid [16].

Testicular Biopsy or Testicular Sperm Extraction

Testicular biopsy or testicular sperm extraction (TESE) performed postmortem is similar to that performed on a live patient (Fig. 17.4). An incision is made over the anterior surface of the testis, or a median raphe incision can be made to access both testes. The incision is carried through the skin, dartos tissue, and tunica vaginalis. A 15° microknife is used to open the tunica albuginea, and the seminiferous tubules are extruded by applying gentle pressure to the

testicle. The specimen is excised and suspended in a cryopreservative solution and then minced and examined for presence of viable sperm. Testicular sperm aspiration (TESA) can also be performed, in which a needle is used to percutaneously aspirate sperm directly from the testis, avoiding an incision. Potential drawbacks to this technique include lower sperm number recovered, which is discussed in detail later.

Testicular sperm can be retrieved by either TESE or TESA; however, there tends to be lower sperm yields with the latter technique. In one study comparing TESE and TESA for sperm harvest in nonobstructive azoospermic patients, TESA had a retrieval rate of 45.9 %, but of these, almost 25 % had insufficient sperm for in vitro fertilization (IVF) [26]. Another study looking at TESE versus TESA in living men undergoing infertility workup revealed that TESE yielded sperm suitable for ICSI in 43 % of cases versus only 11 % for TESA [27]. Unlike in living patients, PSP does not afford the luxury of performing subsequent procedures if an insufficient sample is obtained. As such, in postmortem patients, where the clinician attempts to retrieve the maximal number of sperm without regard to post-procedural testicular function, TESE is preferred.

Informed Consent and Advanced Directives

Informed consent authorizes the physician to treat the patient with a specified intervention. Consent works to both allow the clinician to institute a therapy and perform a procedure only after the patient has been explained the risks, benefits, and alternatives to the therapy or procedure. The discussion enables the patient or surrogate decision maker to accept or reject a proposed treatment and is only possible when he or she has full mental capacity, understands the conditions, has been provided full disclosure, and is voluntary. In regard to PSP, informed consent would be obtained prior to a sudden life-threatening event, and a patient's wish would be well documented (which is rarely the case). In other clinical scenarios, presumed consent or implied consent is used to guide treatment principles when a patient is unable to communicate his or her wishes. However, PSP cannot have direct benefit to the deceased individual and so acting in the patient's best interest does not imply.

Advanced directives are written instructions by a person with capacity regarding medical care if that person is unable to participate in directing his or her care, such as in the event of serious illness or accident when he or she is unable to understand or communicate. Advanced directives can include a living will and a healthcare power of attorney but can also include Do-Not-Resuscitate instructions, tissue donation, and end-of-life supportive measures.

Directives for PSP are particularly critical from a legal and ethical standpoint. Regardless of the circumstances surrounding a death, or the relationship of the person requesting PSP to the deceased, the wishes of the deceased should guide the physician's decision to carry out the PSP. Since the deceased cannot provide an informed consent, ideally an advanced directive exists regarding the stipulations of posthumous procurement of his sperm. It should be as specific as possible and clearly outline his intention to father a child after death, as well as grant permission to retrieve the sperm, and direct who, specifically, he wants to utilize the sperm. As expected, most clinical controversies over PSP occur because there is a lack of any directive. While standard topics for advanced directives do include ventilators and resuscitation, direction for PSP is not addressed. In many cases, spouses claim that the directive for PSP was spoken about; however, without legal documentation and unbiased proof, the patients' wishes are purely speculative. Finally, consent from the surrogate medical decision maker is still necessary for sperm harvesting, as according to the directive set forth by the deceased.

This real-life situation illustrates the complexity of these cases. A man died suddenly in a tractor accident, and his wife requested to speak with a fertility specialist. She relayed that they had been attempting to conceive. Per her report, the couple had discussed posthumous reproduction, and his brother had been witness to this conversation. The husband agreed that in the event that he

died, he would want his wife to use his sperm to conceive their child. The brother's verification of the patient's wishes provided the legal support needed to confirm the patient's wishes and consent for the procedure, even though they were not formally documented. The deceased man's sperm were harvested via epididymal sperm aspiration and cryopreserved per this directive (Thomas A. Personal communication. August 2012).

This case illustrates an important aspect of PSP. It is paramount that the requesting person has explicit evidence of intent that the deceased not only would have wanted children but also would have wanted a specific person to have children *even after his death*. Evidence of his wishes would include actively trying to conceive at the time of death, plans to undergo ART, or directly indicating that he wanted a child after his death. In the absence of a directive, the lack of objection does not substantiate affirmation. Furthermore, it is crucial to assess the relationship between the person and the requesting widow or family proxy. Are there other children involved already in the family? What are the possible financial implications or secondary gains sought by the requesting person? These questions are difficult to dissect in and of themselves, much less around the time of death and when PSP is under a time restriction.

Ethical Considerations

The overriding concern when executing posthumous reproduction should be guided by sound ethical principles. When proper directives and consent are available, most ethicists concur that PSP is permissible [28]. Respecting the wishes of the deceased is of the utmost importance. An individual who desires to conceive children while alive may not have similar wishes after death, without the opportunity to be involved in parenting. The gamete retrieval itself could be considered an act of assault by the performing physician if done without directive, both an ethical and legal issue [29]. Sperm retrieval, unlike organ donation, is not an altruistic act, does not save a life, and is self-serving by the party requesting the retrieval. Therefore, PSP cannot be performed as a simple request of a surrogate, even a wife, and should have some form of directive from the deceased [13, 15, 30].

Principles of justice and fair use of resources must be considered for the not-yet-conceived child. Issues such as continued social, financial, and emotional support should be secured for a child that is intentionally being born into a life with only one biologic parent involved in rearing. As federal law in the United States does not exist to guarantee governmental financial support of posthumously conceived children, other means of support should be available prior to making the decision to proceed with fertilization. Medically, consideration should be given to situations of high risk or harm to the future child, such as risk of pregnancy complications in an at-risk pregnancy (such as with advanced maternal age along with the multiple gestation risk with ARTs), or genetic abnormalities which may be passed on to the offspring, and infectious disease. The long-term implications of a lack of a biologic father may be difficult to understand at the time of death and PSP request. These issues are all of paramount importance to ensure the health and success of the potential future child. Thus, highlighting these issues during family counseling becomes a key step when pursuing posthumous reproduction.

Posthumous sperm procurement is most commonly requested from a widow, significant partner, parent or another family member, but has also been requested by social workers, family friends and even intensive care unit nurses [3]. There is no consensus agreement regarding why or which of these requests should be honored. Some regard PSP as legitimate only if the request is from the spouse, keeping with the existing family unit; others regard retrieval justified if the donor consented to a broader use [15]. Justification for the use of PSP in these unique cases is rarely easy, and each must be handled on a case by case basis.

Psychosocial Impact

Due to the relatively uncommon request for PSP and posthumous reproduction, there is no published data examining the psychological

health of the offspring. The emotional impact on a child when learning that he or she was conceived through posthumous reproduction is unknown [15]. Studies of children with only one living parent suggest issues throughout development including diminished sense of overall well-being, adaptive and functional problems at school and with peers, and identity problems when the child takes on the dual roles of self and the deceased parent [31–33]. Overall the literature is controversial regarding child rearing in single parent situations but certainly has not been studied with the unique situation of posthumous reproduction. Through counseling prior to the decision to utilize posthumously retrieved gametes, the surviving spouse should be made aware that the danger of infringing on the potential future child's autonomy if the parent perceives the child as a symbolic replacement of the dead parent or gamete donor, a so-called "commemorative child" [15]. Most agree that the requirement of a bereavement period from harvest to possible use of the gamete helps to prevent poor decisions based on grieving the loss of the partner.

Economics

There are several economic considerations unique to PSP and reproduction that should not be neglected. Who is responsible for covering the cost of harvesting the gametes, including operative time, equipment, surgeon's fees, and storage of gametes? Should funds be set aside by the donor when signing the consent form (if a consent form is involved)? Would government or insurance health plans support the child in the instance of a parent looking to continue their deceased son's bloodline? What will be the financial commitment to raising the child to adulthood and self-sufficiency, and who bears this responsibility? Who becomes responsible for the child if the other parent is not able to care for him/her? The deceased father, the mother, family, or government? How are funds in an inheritance trust divided? It is undeniable that a financial discussion should precede posthumous reproduction, but should this financial discussion become part of the requirements for posthumous reproduction? These questions and many others become intrinsic to the performance of the procedure and, in many cases, remain unanswered.

Posthumous reproduction will financially impact the family of the deceased. Available law has made specific concessions for children born to a parent who suffered the untimely death of her spouse to receive the inheritance of the deceased father; however, these laws pertain to children conceived while the father was alive and are considered lawful heirs [34]. Laws of inheritance are ambiguous involving children who are conceived posthumously, although several states do have these specific statutes [35]. A landmark US Supreme Court decision was passed in May of 2012 regarding Social Security benefits for posthumously conceived children based on the following case [9]. Robert Capato's diagnosis of esophageal cancer led him and his wife to bank sperm prior to chemotherapy. He passed away from the disease 3 years later, and 9 months after his death, his wife used his frozen sperm to undergo ART and gave birth to twins. Subsequently, she applied for Social Security survivor benefits but was denied, because under Florida law (their home state), posthumously conceived children are not eligible for inheritance through intestate succession (the law of descent and distribution).

Several other examples exist that illustrate the heterogeneity of state laws in regard to monetary benefits. One such case highlights a debate over Social Security benefits of the deceased [36]. Using sperm that were originally cryopreserved for ART, the man's widow gave birth to twins 2 years after his death. While the initial claim was rejected by the Social Security Administration, the Massachusetts Judicial Court held that the children were entitled to inheritance if proof existed of genetic relationship to the father, evidence of consent for posthumous use of the sperm, and consent that the deceased would support any posthumously conceived children [37]. On the other hand, the California intestacy law states that a child born more than 2 years after the death of a genetic parent is not eligible for Social Security benefits [38]. In an attempt to unify and streamline the various individ-

ual state practices on inheritance rights, the Uniform Probate Code (UPC) was created [37]. The UPC was originally drafted in 1969 and most recently revised in 2006, but it has not been uniformly adopted by all states; thus, discrepancy continues regarding inheritance rights, including those of children born by posthumous conception.

Legal

Legislation regarding PSP is sparse within many countries, including the USA, that do not prohibit the practice. In other countries, including Canada, Denmark, Egypt, France, Germany, Korea, Norway, Spain, Sweden, and the Netherlands, PSP is completely banned.

Since there are no specific laws regarding PSP in the USA, extrapolation from related legislation provides the basis for decisions for practicing fertility specialists. In general, donor intent is the most important consideration [39]. Sperm and gametes are a unique form of property, in that they fall somewhere between a potential human being and biologic tissues. They are therefore not subject to general property laws [40] and cannot be inherited, and their use posthumously must be explicitly directed by the deceased. This is in contrast to the Uniform Anatomical Gift Act, which governs organ donation as we know it today, in which *family members* of the deceased are able to direct who receives the dead person's organs that they intended to donate [39]. Minor donors are another special situation, as competency and consent are considered. No law prohibits PSP from minors. Parents have the authority to consent to medical procedures, but do not have the ability to make the patient a parent. Above all, the fertility specialist retains the moral obligation to act only in a manner that he/she believes is correct.

Physician's Attitudes

In a survey conducted to ascertain physicians' attitudes on fertility for poor-prognosis cancer patients, 22 % of the over 600 physicians queried believed these patients should not pursue fertility preservation and only 16 % supported posthumous parenting, with younger physicians having a more supportive attitude toward posthumous parenting than their older colleagues [41]. In a second study looking at fertility counseling for cancer patients, only 60 % of oncologists surveyed discussed the infertility risk, and 51 % of patients were given the opportunity for semen cryopreservation prior to oncotherapy [42]. Undoubtedly, the use of cryopreservation in patients with a poor prognosis is an ethically challenging question, and a physician cannot be coerced into performing a procedure that violates his/her ethical or moral code. However, personal bias should not override the patient's right to make their own choices for fertility preservation, and at the very least these patients should be referral for counseling for fertility preservation.

Posthumous sperm procurement, while performed by the urologic infertility specialist, has a larger team associated with the process. The andrology laboratory should have provisions for PSP or postmortem use of cryopreserved sperm. A hospital ethics committee, if available, can assess individual situations of PSP requests, although a multicenter survey revealed that most physicians felt that an ethics committee would usually be unnecessary when dealing with postmortem reproduction, with only 4.7 % responding that they would consult their ethics committee or a bioethicist [3]. The reason for the low rate of physician consulting ethics committee is only speculative. Perhaps it is the belief that there is no availability, or support, or that it will be too cumbersome and time-consuming to involve a third party. Conversely, is it a lack of a clear understanding of the indications for posthumous reproduction? Or is it the belief that due to the scarcity of these cases, physicians would have the insight to handle them appropriately? A better understanding of these issues may facilitate appropriate, timely, and consistent decision making for PSP.

Reproductive Outcomes

A number of factors contribute to the success of posthumous reproduction after PSP, including the health and medical comorbidities of the man,

the fertility health and history of the woman, and the experience of the healthcare team and andrology laboratory. The method of sperm extraction does not seem to have an effect on ART outcomes, provided that viable sperm are present. A study comparing fertilization rates for couples undergoing ART via ICSI for obstructive azoospermia via percutaneous epididymal sperm aspiration (PESA) or nonobstructive azoospermia via TESE showed no difference on fertilization rates based on the method of obtaining sperm; fertilization rates were 78.5 % for PESA, 83.3 % for TESE, and 80.8 % for ejaculated sperm [43]. We can extrapolate that these data will apply to PSP, since to date there are no large series regarding success rates for sperm retrieval and ICSI for PSP.

Since the original cases, there are several other reports of PSP noted in the literature, although there is overall limited published experience with reproductive outcomes. A recent multicenter experience reporting reproductive outcomes yielded 17 total cases of PSP from 2001 to 2004 [17]. One case had no motile sperm present, and two cases had cryopreserved en bloc orchioepididymectomy specimen without testing for sperm. Two cases of the 17 had subsequent requests for use of the preserved sperm, both of which yielded a pregnancy. Of the 14 patients who had sperm analyzed, 12 had motile sperm and at least 1 from each technique.

A recent report of the Israeli PSP experience shows 21 PSP procedures in an 8-year time frame. The demographics included 11 from married men and ten from unmarried men [44]. From unmarried men, nine of ten procedures were performed under court order after petition by the parents, and one was carried out after the mother of the deceased placed conditions on donation of the man's solid organs for transplantation in exchange for PSP. Of the 11 men with widows, after the bereavement period, six women were not interested in the use or fate of the sperm, and four women requested the sperm be discarded. One sample was still within the bereavement period at the writing of the article. For investigational purposes, two of the four samples that were discarded were thawed first and examined, and good morphology was noted but no motility of the sperm. As one can see from the above experiences, in the proper situation, PSP usually yields sufficient motile sperm, and request for utilization of the sperm is quite low.

Conclusion

Posthumous sperm procurement and subsequent utilization for postmortem reproduction is yet another option on the ever-expanding frontier of reproductive medicine for subfertile couples. Globally, there has been an increased interest in PSP; subsequently, fertility specialists are involved in this unique patient care. As the prevalence of PSP increases, so too does the number of available guidelines and recommendations to assist in decision making. Furthermore, there has been an increase and push for fertility centers to adopt institutional guidelines should a request for PSP arise. What the available guidelines have made clear and consistent is that honoring the wishes of the deceased is of utmost importance, directive and consent for PSP are a must, and a bereavement period is necessary prior to using the sperm for assisted reproduction.

Techniques for PSP have moved from excisional procedures to minimally invasive options, such as electroejaculation for the brain-dead patient and PESA and TESE after cardiac death. No procedure has shown superiority over another in regard to yielding sperm for ICSI. The timing of PSP is generally considered ideal when within 24 h of death, but further cases will likely expand the limits of extraction.

While the incidence of request for PSP is quite low at any given fertility center, it is clear from previous literature reports that requests can become complex and involve intricate psychosocial issues, economic considerations, and ethical dilemmas. An ethics committee may assist with many of these issues, and the fertility specialist should not have to act alone when dealing with these complicated and highly emotional situations. Furthermore, as PSP is not illegal in the USA, as it is in several other countries, most court decisions with PSP and posthumous conception

involve intestacy and continue to be handled on a case-by-case basis.

Posthumous sperm procurement is an exciting reproductive option and adds to the ever-changing landscape of fertility and urologic care. The field will likely continue to evolve as prevalence continues to increase and legal decisions gain popularity. What remains consistent, however, is the obligation to do what is ethically honorable by the deceased and the future child.

Acknowledgment We would like to thank Dr. Anthony Thomas for his insight into the fertility and bioethical aspects of posthumous reproduction and assistance with editing this chapter.

References

1. Centers for Disease Control and Prevention, American Society for Reproductive Medicine, Society for Assisted Reproductive Technology. 2007 Assisted reproductive technology success rates: national summary and fertility clinic reports. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 2009.
2. Rothman CM. A method for obtaining viable sperm in the postmortem state. Fertil Steril. 1980;34:512.
3. Kerr SM, Caplan A, Polin G, Smugar S, O'Neill K, Urowitz S. Postmortem sperm procurement. J Urol. 1997;157:2154–8.
4. Hurwitz JM, MacDonald JA, Lifshitz LV, Batzer FR, Caplan A. Posthumous sperm procurement: an update. Fertil Steril. 2002;78 Suppl 1:S242.
5. Townsend 3rd MF, Richard JR, Witt MA. Artificially stimulated ejaculation in the brain dead patient: a case report. Urology. 1996;47:760–2.
6. Brahams D. A unique case of frozen sperm export? Lancet. 1997;349:448.
7. Hecht v. Superior Court, 16 Cal. App. 4th 836, 20 Cal. Rptr. 2d 275 (1993).
8. Crockin S. Legal issues related to parenthood after cancer. J Natl Cancer Inst Monogr. 2005;34:111–3.
9. Astrue v. Capato, 132 S.Ct. 2021 (2012).
10. Yogev L, Kleiman SE, Shabtai E, Botchan A, Paz G, Hauser R, et al. Long-term cryostorage of sperm in a human sperm bank does not damage progressive motility concentration. Hum Reprod. 2010;25(5): 1097–103.
11. DiSanto M, Tarozzi N, Nadalini M, Borini A. Human sperm cryopreservation: update on techniques, effect on DNA integrity, and implications for ART. Adv Urol. 2012;2012:854837.
12. Huang FJ, Lan KC, Lin YC, Tsai MY, Kung FT, Chang SY. Impact of duration of cryopreservation of spermatozoa obtained through testicular sperm extraction on intracytoplasmic sperm injection. Fertil Steril. 2004;81(5):1405–7.
13. Ethics Committee of the American Society for Reproductive Medicine. Posthumous Reproduction. Fertil Steril. 2004;82 Suppl 1:S260–2.
14. Bostwick JM, Coddington CC, Stewart EA. Case 21–2010: Anoxic brain injury and a request for oocyte retrieval. N Engl J Med. 2010;363(17):1679.
15. ESHRE Task Force on ethics and law, Pennings G, de Wert G, Shenfield F, Cohen J, Devroey P, et al. ESHRE Task Force on Ethics and Law 11: Posthumous assisted reproduction. Hum Reprod. 2006;21(12):3050–3.
16. Tash JA, Applegarth LA, Kerr SM, Finns JJ, Rosenwaks Z, Shlegel PN. Postmortem sperm retrieval: the effect of instituting guidelines. J Urol. 2003;170:1922–5.
17. Shefi S, Raviv G, Eisenberg ML, Weissenberg R, Jalalian L, Levron J, et al. Posthumous sperm retrieval: analysis of time interval to harvest sperm. Hum Reprod. 2006;21(11):2890–3.
18. Land S, Ross LS. Posthumous reproduction: current and future status. Urol Clin North Am. 2002;29:863–71.
19. Sønksen J, Ohl DA. Penile vibratory stimulation and electroejaculation in the treatment of ejaculatory dysfunction. Int J Androl. 2002;25(6):324–32.
20. Ohl DA, Wolf LJ, Menge AC, Christman GM, Hurd WW, Ansbacher R, et al. Electroejaculation and assisted reproductive technologies in the treatment of anejaculatory infertility. Fertil Steril. 2001;76(6): 1249–55.
21. Chung PH, Verkauf BS, Eichberg RD, Casady L, Sanford EJ, Maroulis GB. Electroejaculation and assisted reproductive techniques for anejaculatory infertility. Obstet Gynecol. 1996;87(1):22–6.
22. Brackett NL, Lynne CM, Ibrahim E, Ohl DA, Sønksen J. Treatment of infertility in men with spinal cord injury. Nat Rev Urol. 2010;7(3):162–72.
23. Ohl DA. Electroejaculation. Urol Clin North Am. 1993;20:181.
24. Matthews GJ, Goldstein M. A simplified method of epididymal sperm aspiration. Urology. 1996;47:123–5.
25. Marmar JL. The emergence of specialized procedures of acquisition, processing, and cryopreservation of epididymal and testicular sperm in connection with intracytoplasmic sperm injection. J Androl. 1998;19: 517–26.
26. Houwen J, Lundin K, Söderlund B, Bergh C, Kremer JA, Ekerhovd E. Efficacy of percutaneous needle aspiration and open biopsy for sperm retrieval in men with non-obstructive azoospermia. Acta Obstet Gynecol. 2008;87:1033–8.
27. Friedler S, Raziel A, Strassburger D, Soffer Y, Komarovsky D, Ron-El R. Testicular sperm retrieval by percutaneous fine needle sperm aspiration compared with testicular sperm extraction by open biopsy in men with non-obstructive azoospermia. Hum Reprod. 1997;12(7):1288–93.
28. Kroon B, Kroon F, Holt S, Wong B, Yazdani A. Postmortem sperm retrieval in Australia. Aust N Z J Obstet Gynaecol. 2012;52(5):487–90.

29. Bahadur G. Death and conception. Hum Reprod. 2002;17(10):2769–75.
30. Hostiuc S, Curca CG. Informed consent in posthumous sperm procurement. Arch Gynecol Obstet. 2010; 282(4):433–8.
31. Krampe EM, Fairweather PD. Father presence and family formation. J Fam Issues. 1993;14(4):572–91.
32. Strong C, Gingrich JR, Kutteh WH. Ethics of postmortem sperm retrieval. Hum Reprod. 2000;15(4): 739–45.
33. Furman E. Children's patterns in mourning the death of a loved one. In: Wass H, Corr CA, editors. Childhood and death. Washington, DC: Hemisphere Publishing Corporation; 1984.
34. Kindregan CP, McBrien M. Symposium on assisted reproduction technology: posthumous reproduction. Am Bar Assoc Fam Law Q. 2005;39:579.
35. Kindregan CP Jr. Posthumous reproduction. Suffolk University Law School Faculty Publications, Paper 24. Boston: Suffolk University Law School; 2005.
36. Woodward v. Comm'r of Soc. Sec., 760 N.E.2d 257 (Mass. 2002).
37. Williams DD. Over my dead body: the legal nightmare and medical phenomenon of posthumous conception through postmortem sperm retrieval. Campbell Law Rev. 2011;34(1):181–202.
38. California Probate Code §249.5 (West 2009).
39. Kahan SE, Seftel AD, Resnick MI. Postmortem sperm procurement: a legal perspective. J Urol. 1999;161(6): 1840–3.
40. Davis v. Davis, 842 S.W. 2d 588, Tenn. 1992 (cert. Denied 113 S. Ct. 1259), 1992.
41. Quinn GP, Knapp CA, Malo TL, McIntyre J, Jacobsen PB, Vadaparampil ST. Physicians' undecided attitudes toward posthumous reproduction: fertility preservation in cancer patients with a poor prognosis. J Support Oncol. 2012;10(4):160–5.
42. Shover LR, Brey K, Lichtin A, Lipshultz LI, Jeha S. Knowledge and experiences regarding cancer, infertility, and sperm banking in younger male survivors. J Clin Oncol. 2002;20:1880–9.
43. Sukcharoen N, Sithipravej T, Promviengchai S, Chinpilas V, Boonkasemsanti W. Comparison of the fertilization rate after intracytoplasmic sperm injection (ICSI) using ejaculated sperms, epididymal sperms and testicular sperms. J Med Assoc Thai. 1998;81(8):565–71.
44. Raziel A, Friedler S, Strassburger D, Kaufman S, Umansky A, Ron-El R. Nationwide use of postmortem retrieved sperm in Israel: a follow-up report. Fertil Steril. 2011;95(8):2693–5.

Ethical Implications of Posthumous Reproduction

18

Valarie K. Blake and Hannah L. Kushnick

I was a posthumous child. My father's eyes had closed upon the light of this world six months, when mine opened on it. There is something strange to me, even now, in the reflection that he never saw me; and something stranger yet in the shadowy remembrance that I have of my first childish associations with his white grave-stone in the churchyard, and of the indefinable compassion I used to feel for it lying out alone there in the dark night.

Charles Dickens, David Copperfield, 1850

To be posthumously born—born after the death of a parent—is neither new nor usual. Throughout time, mothers have died delivering their children into the world and fathers have gone off to war and never returned. Though tragic and undoubtedly formative for the child, such upbringings are unplanned and unavoidable—the product of fate. To be *posthumously conceived*, however, is much rarer and has only been made possible by recent technological advances that allow long-term maintenance of egg, sperm, and embryos outside of the body, including in vitro fertilization and cryopreservation techniques. Posthumous reproduction differs from posthumous birth because the *conception* occurs after the parent's death, and the act is intentional rather than a product of fate—sometimes it is even planned for prior to death. This new and unusual reproductive method raises broad and complex social questions about the meaning of life and death, what motivates the surviving would-be parent to make such a request, what parenthood means to both parent and child, the ethics of bringing a child into the world, and the limits of ethical medicine.

The ethical implications of posthumous reproduction vary with the unique factors of a case: does it involve postmortem retrieval of gametes or stored tissue? Who is requesting the posthumous reproduction, and what is the nature of their relationship with the decedent (potential scenarios include romantic partner, family member, or stranger)? Did the decedent show any interest in procreating while alive, and what, if anything, do we know about their wishes after death? Is there either adequate informed consent by the deceased or does the act respect the deceased's wishes? Will posthumous reproduction fulfill the motivations and goals of the surviving partner? Are there protections for the best interests of the child? Are third parties like physicians adequately informed before they become involved?

These considerations will be addressed from the perspectives of key stakeholders implicated in posthumous reproduction. When a request for posthumous reproduction is made, first, we consider the interests of the deceased: what do we know about their reproductive goals and their

V.K. Blake (✉) • H.L. Kushnick
Department of Ethics, American Medical Association, 515 N State St, Chicago, IL 60654, USA
e-mail: Valarie.Blake@ama-assn.org; hannah.kushnick@ama-assn.org

J.M. Goldfarb (ed.), *Third-Party Reproduction: A Comprehensive Guide*,
DOI 10.1007/978-1-4614-7169-1_18,

wishes before and after death? Next we consider the point of view of the requestor, whether a romantic partner or other loved one, whose autonomy and reproductive interests may be linked to those of the deceased. The well-being of the resulting child, the only party unable to have some say in whether posthumous reproduction occurs, must be considered carefully, particularly given the child's inability to protect his or her own interests. Lastly, the third parties who are instrumental in the practice, including gestational carriers, physicians, and society, also play a role in whether such requests are honored. Our analysis focuses on the social, legal, and ethical context of the United States and, as such, is primarily rights based—premised on the idea that individuals are morally or legally entitled to certain things to be provided by society or other individuals and which often come with corresponding responsibilities or duties.

The Deceased

Decedents generally have two primary interests affected by posthumous reproduction: (1) controlling the affairs surrounding one's death and (2) reproduction and its unique significance to the individual.

Generally, as is demonstrated by customs and laws surrounding wills, we respect a deceased person's right to control certain postmortem events, including donation of organs, transfer of property, and naming of beneficiaries to an estate. We do so to protect the rights and interests of the decedent and his or her family, particularly the right to control how one will be remembered after death and "the opportunity to be the conclusive author of a highly significant chapter of his or her life"—to control the content and outlines of one's life [1]. Furthermore, social norms require broad respect for the *bodies* of the dead. We allow people to dictate, while living, whether they would like to donate organs or donate their bodies to science, and we place stringent limits on the use of the dead in research and medical education. Our respect for the dead is an extension of our respect for persons and our respect for bodily integrity arising from respect for individuals' autonomy and their right to be free from bodily invasion, as well as respect for the deceased person's memory and their loved ones. Posthumous reproduction raises fundamental questions about the special significance of reproduction, respect for persons, and respect for the dead.

Reproduction carries special significance for individuals and contributes significantly to their personal identities and their lives' meaning, whether they have or intend to have children or to remain childless. Ethicists have argued that ideally individuals should have liberty to decide whether and when to reproduce based on their own personal wishes and values about the meaning and responsibilities of parenthood and judgment about what circumstances are optimal for having and raising a family [2, 3]. Retrieving gametes from the deceased or the comatose is incredibly controversial when the deceased has not given prior consent, particularly because the procedure is not done for any type of medical benefit. Even though organ retrieval and cadaver donation also do not offer the deceased any medical benefit, they require consent. And while autopsy moves forward without the deceased's express consent, the family is involved, and the process furthers clear public goods like public health and safety. One ethicist has gone so far as to call posthumous retrieval of gametes without consent as the moral equivalent of rape because of the magnitude to which it offends one's bodily integrity without the consent of the individual [4].

Yet, the level of respect afforded to a deceased person's reproductive interests is unclear. While many scholars may believe that carrying out the wishes and protecting the interests of the dead is not only desirable but a moral obligation, it could also be argued that harm cannot come to a person after death because a dead person "can no longer be said to have interests" [2]. (In the most extreme version of this view, the only possible harm of posthumous reproduction is the fear, while alive, that one will not be able to control one's reproduction after death [2].) If there is *no way* a decedent will experience the violation of his or her liberties, beliefs, or desires, does it still "count"? It is crucially important to draw a bright line

between the actually dead and the unconscious or mentally impaired; a comatose person may regain consciousness unexpectedly. To find that one has reproduced without one's consent while unconscious would be both disturbing and an affront to one's right to self-determination. A dead person, who has *no chance* of experiencing such violations, may not need or deserve the same rights as persons who are alive and have some level of capacity, however minimal or unpredictable, that would allow them to perceive these violations.

Alternatively, even if the dead are presumed to have no interests in reproduction, benefits of posthumous reproduction that may accrue to them during life ought to be respected. While posthumous parents do not experience many of the meaningful aspects of having children that we attribute to the living—gestation, birth, raising the child, or even the certain knowledge that they have reproduced genetically—a person who planned a posthumous conception may have derived some value or fulfillment from to the idea of living on after death through the child or affording a loved one the opportunity to have a child. To understand the legitimacy of a request, it is important to define which meaningful aspects of reproduction are fulfilled for that unique individual in the case of posthumous reproduction [2].

Given uncertainty about how much respect to afford the deceased (over reproduction, bodily interests, or decisions related to death), in cultures that emphasize individual liberty and accept a plurality of beliefs about life after death (such as the United States), the greatest protection we can afford the deceased is some measure of legitimate and meaningful informed consent for posthumous reproduction.

Two case studies demonstrate the different types of informed consent in posthumous reproduction: presumed consent and express consent.

Presumed Consent: The Case of Stephen Blood

After several years of marriage, Stephen Blood contracted bacterial meningitis. Given that there was no reasonable chance of recovery, his wife, Diane, requested that Stephen's sperm be retrieved and cryopreserved while he was still comatose, arguing that this was what her husband would have wanted. While the pair had not discussed posthumous reproduction, they had been trying to become pregnant in the months leading up to Stephen's illness and ultimate death.

Because Stephen Blood did not explicitly consent to sperm retrieval while he was comatose, such a case raises questions about bodily integrity and ensuring that the decedent is not used as a means to someone else's reproductive end. Families and spouses play an important role in consenting to certain procedures like organ retrieval and autopsies in death or medical procedures when the individual is incapacitated, yet this role is challenged when tissue that has reproductive potential is involved [5, 6]. Family members may pressure or persuade their loved ones to have children, but they do not have direct or legitimate control over whether and when this might occur. And, while spouses' reproductive interests may be linked to the deceased, even they do not have an interest that exceeds that of their spouse (more on this in the next section).

The main issue in Blood's case is whether he gave adequate consent not just for the retrieval of sperm but also the use of that sperm by his wife to become pregnant. The burden was on Diane to demonstrate that her husband Stephen would have wanted posthumous reproduction. There is some evidence that the surviving partner does not always accurately guess what their partner would have wanted—in one recent study of couples seeking fertility treatment, 25 % of respondents guessed incorrectly what their partner would have wanted [7].

Even in cases when the deceased demonstrated a strong interest in having children while living by, for example, gamete banking, trying to have a child, or building a nursery, it does not follow that this indicates a desire to have children posthumously. Posthumous reproduction remains incredibly rare, and most people do not anticipate that their gametes will be used after their death. And even where there is some evidence that the deceased accepted the idea of not

knowing genetically related children (as in the case of a deceased man who had donated sperm anonymously in the past), it still does not follow that the man would have wanted children posthumously with his partner and to be known and identified as a parent after his death [6].

On the other hand, a decedent who did not wish to reproduce would not experience some of the reasons he or she may have wished to avoid it—childrearing, financial, or other parental responsibilities. Requiring implied consent, or proof that this is what the deceased would have wanted, hinges on a belief that most people would not want to reproduce posthumously and/or that such reproduction is in some way harmful or undesirable rather than neutral or positive. But is this accurate? The study cited above found that 78 % of members of couples seeking fertility treatments would want the surviving partner to use their stored gametes after their death [7]. Yet, posthumous reproduction is fairly new, and many, perhaps event most, people have not had cause to consider the possibility of posthumous reproduction. There are a range of positions one might take about it. Some people might not want to *raise* children, but see no problem with reproduction that does not involve childbearing or childrearing. Some might feel that, even though they have no particular interest in reproducing, they also have no objection to it. Some might wish to benefit a grieving partner by enabling the conception of a posthumous child. The Stephen Bloods of this world, who might want their legacies continued in this way, may have neglected to specify it because they are in good health and do not anticipate dying. Though it would require greater public awareness of the existence of posthumous reproduction, an opt-out social convention would allow those who probably or definitely do *not* want their genetic material reproduced after death (who, for example, have religious or philosophical objections to the practice or who desire a tightly controlled family reputation or legacy) to specify their preference in advance care directives, wills, registries, or the like. Alternatively, as in the next case, some might choose to explicitly state a desire to reproduce posthumously.

Express Consent: William Kane

Before committing suicide, wealthy and eccentric William Kane deposited sperm at a fertility clinic and executed both a directive and a will that expressly gave consent for his girlfriend, Deborah Hecht, to use his sperm to have his baby after his death. Kane and Hecht discussed posthumous reproduction while Kane was still alive and even agreed to a name for the child: Wyatt.

The ideal situation, from the perspective of the decedent's rights, is William Kane's, in which he provided express written informed consent and we have some idea of his motivations for wishing to reproduce posthumously. Both the American Society for Reproductive Medicine (ASRM) and the European Society of Human Reproduction and Embryology (ESHRE), two reproductive medicine specialty societies, encourage written informed consent at the time of storing gametes to provide some indication of the deceased's wishes after death. These recommendations are made out of respect for autonomy and prevent individuals' gametes from being used without their knowledge or consent [8, 9].

Though this case is ideal in the sense that it is devoid of ambiguity about the wishes of the deceased, the deceased's desire to posthumously reproduce does not necessarily mean that an act of posthumous reproduction should occur. While some may argue that granting the deceased's wishes respects and even extends his or her autonomy, others might argue that it is impossible to ever fully understand the consequences of posthumous reproduction enough to consent to it [10].

To best protect decedents' interests in posthumous reproduction, we recommend either presumed or expressed informed consent be sought:

- Informed consent requires that the individual demonstrate decision-making capacity, have adequate knowledge to inform the decision, and provide voluntary consent without undue coercion.
- Requests for posthumous reproduction should not be honored if the deceased explicitly refused posthumous reproduction while alive.

- Informed consent may be presumed if there is strong evidence that having a child after death is what the deceased would have wanted.

A discussion about posthumous reproduction also requires a recognition of the limits to the individual's *right* to posthumously procreate. It was clear that Deborah Hecht consented (indeed, sought) to have Kane's child, but what if Kane had requested that 1,000 strangers be inseminated with his sperm, or his daughter, or an elephant [11]? Even the clearest consent does not take into account the ramifications of the act for other parties, including the willingness and interest of the surviving partner, the well-being of the potential child, and the obligation of a physician or clinic to fulfill the decedent's wish [5]. We will consider these interests in the remainder of the chapter.

The Surviving Partner or Other Requester

While the decedent's interests are important, there is another key stakeholder involved: the surviving partner or loved one who makes the request for posthumous reproduction. Some requests come from a person who was romantically involved with the decedent, while other requests come from family members, including parents or siblings. In the United States, where reproduction has been seen as an intensely personal choice, relatives have little claim because they are not socially considered to have a stake in the party's reproductive interests even when alive, unlike romantic partners, who often reproduce together. Special caution is therefore necessary when the requests come from family. But does *anyone* have a claim to use a dead person's genetic material for reproduction? Techniques to cryopreserve eggs have been slower to develop than techniques to preserve sperm; thus, the majority of posthumous reproduction requests to date have dealt with deceased men. The surviving partner's motivations are important to assess the legitimacy of his or her claim to the dead partner's genetic material.

Romantic relationships or marriages and childbearing do not always go hand in hand, and respect for persons dictates that the grieving partner has no overriding right to the individual's gametes, in death or in life [3]. The living partner is free to find other ways to fulfill a desire to have children in general, by having children with another person, using egg or sperm donation, pursuing adoption, or another method. However, the grieving widow's or partner's intentions to have a baby with *this* person will die with him or her if posthumous reproduction is not undertaken. As Blood said, "I have the most right to my husband's sperm and I desperately want his baby" [12]. For some, posthumous reproduction may be a way to preserve or extend the relationship with the deceased partner over time [1, 9], to wrest something positive from the death, or simply process the grief of losing a partner.

The desire to reproduce is often a shared interest; allowing the remaining individual to have the deceased's child fulfills that collective intentionality [13]. Posthumous reproduction specifically may even have special meaning for the couple, as with Hecht and Kane, who planned for the sperm banking together. In such cases, posthumous reproduction would not be using the dead as means to someone else's end, but instead honoring the wishes of both parties, and may therefore be considered acceptable from the perspective of the decedent's wishes.

But what harm may come to the surviving parent if posthumous reproduction is undertaken? There is a risk that the parent's feelings will change over time: that he or she will come to regret having the child or see the child as an unwelcome reminder of the death [1]. Often these concerns can be eliminated by ensuring truly informed consent on the part of the surviving partner. Retrieval or continued storage of gametes for a period can give the surviving partner time to consider his or her wishes and motivations and to grieve before making decisions about whether to pursue posthumous reproduction. For this reason, ESHRE encourages a waiting period before the survivor uses the gametes [9].

As with decedents, we recommend the surviving partner or other requestor is best protected by ensuring adequate informed consent:

- Informed consent requires that the individual demonstrate decision-making capacity, have

adequate knowledge to inform the decision, and provide voluntary consent without undue coercion. This may involve a waiting period in which grieving people can consider their wishes.

The Child

Even in the "ideal" situation, when the rights of the deceased and living would-be parents have been adequately protected, the well-being of the resulting child must also be considered. Unlike all of the other stakeholders, for whom informed consent is emphasized, the child does not have a voice in this debate—and his or her entire existence hinges on the decision of whether to approve posthumous reproduction or not.

The most common critique of posthumous reproduction from the child's perspective is that it will in some way harm the child. Will the child be harmed by growing up with only one parent, and is this any different than a child growing up with only one parent for other reasons [1]? Will the child feel he or she was conceived merely as a means to someone else's end, whether to cope with grief or replace a lost parent, and will that negatively affect him or her [14]? There is a risk that the surviving partner will treat the child as nothing more than a commemoration of the dead, placing expectations on the child that he or she cannot live up to or blurring the child's identity into that of the deceased [1, 9]. This is more likely if the surviving partner pursues the reproduction process partly because of the expectations of the deceased's family, a perceived duty to carry out the deceased's wishes, or survivor's guilt, all of which could be further exacerbated by societal pressures on women to have and raise children [9, 11].

In addition to family dynamics, there might be other ramifications. Will the child be stigmatized by others for his or her way of coming into the world? This may greatly depend on the family's reasons for posthumously procreating as well as social perceptions of the practice. Will the child have adequate financial support, especially given that posthumously conceived children may not be able to inherit or receive Social Security from the deceased parent [15, 16]?

At this point, in the absence of adequate empirical research about the consequences of posthumous reproduction for offspring, we can only speculate about whether the posthumously conceived child's experience is different than that of other children born after a parent's death [17]. In general, though, any harms of being posthumously conceived could only be avoided if the child never existed, a state numerous ethicists consider unambiguously worse than whatever the avoided harms [1, 2]. The argument presumes that being alive is better than having not been born—an issue that features prominently in ethical discussions about the validity of wrongful life lawsuits [18].

Key Third Parties

A variety of other entities have a stake in posthumous reproduction, among them the gestational carriers who take part in third-party reproduction if the deceased is female, the physicians and clinics who must decide whether to participate, and society at large.

Gestational carriers are necessary in posthumous reproduction for deceased women. Medical specialty guidelines agree that a gestational carrier should be informed when a pregnancy she would carry is posthumously conceived [8, 9], to allow her the choice of whether to participate. The underlying reason is to respect the values, wishes, and autonomy of the carrier and to acknowledge the special and intimate role she plays and the significant time and emotional involvement she invests in third-party reproduction.

In the US context, where little regulation exists at either the state or the federal level to guide the practice, physicians are ultimately the frontline responders tasked with deciding whether to honor or refuse requests for posthumous reproduction. Physicians are involved at a number of levels: they may be asked to retrieve gametes from a deceased or comatose patient or to transfer stored embryos and gametes for in

vitro fertilization. ASRM and ESHRE have developed professional guidelines to aid physicians in making these decisions. ESHRE statements require physicians to consider the welfare of the child and not take part in posthumous reproduction if there is a high risk of serious harm to the child—such as evidence of child abuse [19].

Ultimately, ethicists and professional societies have left it to the individual physician whether to take part in posthumous reproduction. In this way, it is much like other morally controversial practices in medicine (abortion, emergency contraception, physician-assisted suicide) about which physicians may invoke the right to conscientiously object in a morally pluralistic society. Some physicians may believe it is their ethical or moral duty to assist in such endeavors to alleviate suffering and promote the surviving spouse's reproductive interests, while other physicians may feel the act of intentionally bringing a child into the world with one parent deceased is unethical or burdensome for society.

Recent data suggest that physicians are undecided about whether posthumous reproduction is ethical. A minority (16 %) supported posthumous parenting, and a larger percentage opposed the practice (32 %), but the majority (51 %) did not have an opinion, which reflects both a divergence of views on the practice and the possibility that physicians are not adequately informed or aware of it [20].

To what extent do (and should) these morally divergent views influence both individual practice and professional society guidance in posthumous reproduction specifically? Given the important interests at stake for all parties, physicians who morally oppose the practice may wish, at minimum, to consider referring patients to a colleague who is willing to consider the practice, especially when the request reflects the wishes of both the deceased and surviving partners and there is informed consent.

We recommend that third-party interests be carefully considered in posthumous reproduction:

- Parties like gestational surrogates or physicians should be informed when they are being asked to participate in posthumous reproduction and should have the ability to refuse, in order to respect pluralistic views among medical professionals and the public.

Lastly, the role of posthumous reproduction in society must also be considered. Social implications and norms may play a significant role in how children resulting from posthumous reproduction might view themselves and whether they are stigmatized, as well as whether posthumous reproduction will become more widely accepted into medical practice. As with other assisted reproduction technologies, such as in vitro fertilization for living couples with fertility problems, society may limit, regulate, or encourage the practice. In Israel, for example, the policies are often strongly pronatalist owing to cultural emphasis on the importance of parenthood, and policies there strongly support implied consent, presuming that the deceased would want their loved one to use their gametes to have children after their death [21]. Researchers in the United States are only now beginning to collect widespread data on the public's perspective. Recent data (a cross-sectional survey of 1,049 men and women between the ages of 18 and 75 living in the United States) suggest that about half of the public support posthumous reproduction and about 70 % think that informed consent should be required [22]. Given continuing legal struggles over the inheritance rights of these children, including whether they can collect Social Security on behalf of the deceased parent, society may have a responsibility to make sure that such children (as with children born into poverty) are not disadvantaged by the circumstances of their birth. The public may look upon posthumous reproduction poorly if it creates burdensome social and financial responsibilities for society. The public must also situate discussions about posthumous reproduction within the wider context of their occurrence. For example, posthumous reproduction may be occurring unwittingly in third-party reproduction with fertility clinics that do not have systematic ways to determine when a donor has died. If the public largely opposes posthumous reproduction, it may wish to consider whether this practice is ethically distinct.

Conclusion

The broad social implications of posthumous reproduction for what it means to be a parent, for how we as a society cope with death, and how we view our children are key areas of interest that we will better understand in the future as posthumous reproduction is studied further. For now, in the absence of social consensus about this prospect that would allow us to make assumptions about what people in general would want, the proper primary considerations when deciding whether a specific case of posthumous reproduction should occur are meaningful informed consent and knowledge about the wishes of the specific decedent and the surviving partner, the freedom of third parties like physicians and gestational surrogates to participate as their ethics inform them, and the well-being of the child.

References

1. Bahadur G. Death and conception. Hum Reprod. 2002;17(10):2769–75.
2. Robertson JA. Emerging paradigms in bioethics: posthumous reproduction. Indiana Law J. 1994;69:1027–65.
3. Strong C. Gamete retrieval after death or irreversible unconsciousness: what counts as informed consent? Camb Q Healthc Ethics. 2006;15:161–71.
4. Andrews LB. The sperminator. The New York Times. 1999 Mar 28.
5. Orr RD, Siegler M. Is posthumous semen retrieval ethically permissible? J Med Ethics. 2002;28:299–303.
6. Spriggs M. Woman wants dead fiance's baby: who owns a dead man's sperm. J Med Ethics. 2004;30:384–5.
7. Nakhuda GS, Wang JG, Sauer MV. Posthumous assisted reproduction: a survey of attitudes of couples seeking fertility treatment and the degree of agreement between intimate partners. Fertil Steril. 2011;96(6):1463–6.
8. The Ethics Committee of the American Society for Reproductive Medicine. Posthumous reproduction. Fertil Steril. 2004;82(1):S260–2.
9. ESHRE Task Force on Ethics and Law. ESHRE Task force on Ethics and Law 11: posthumous reproduction. Hum Reprod. 2006;21(12):3050–3.
10. Cannold L. Who owns a dead man's sperm? J Med Ethics. 2004;30:386.
11. Shuster E. The posthumous gift of life: the world according to Kane. J Contemp Health Law Policy. 1999;15:401–23.
12. Simpson BOB. Making bad deaths good: the kinship consequences of posthumous conception. J R Anthropol Inst. 2001;7(1):1–18.
13. Parker M. Response to Orr and Siegler- collective intentionality and procreative desires: the permissible view on consent to posthumous conception. J Med Ethics. 2004;30:389–92.
14. Knapp C, Quinn G, Bower B, Zoloth L. Posthumous reproduction and palliative care. J Palliat Med. 2011;14(8):895–8.
15. Kindregan CP, McBrien M. Posthumous reproduction. Fam Law Q. 2005;39:579–97.
16. Astrue v Caputo, 132 S Ct 2021 (2012).
17. Steinbock B, McClamrock R. When is birth unfair to the child? Hastings Cent Rep. 1994;24:15–21.
18. Shiffrin SV. Wrongful life, procreative responsibility, and the significance of harm. Leg Theory. 1999;5:117–48.
19. ESHRE Task Force on Ethics and Law. ESHRE Task force on Ethics and Law 13: the welfare of the child in medically assisted reproduction. Hum Reprod. 2007;22(10):2585–8.
20. Quinn GP, Knapp CA, Malo TL, McIntyre J, Jacobsen PB, Vadaparampil ST. Physicians' undecided attitudes toward posthumous reproduction: fertility preservation in cancer patients with a poor prognosis. J Support Oncol. 2012;10:160–5.
21. Ravitsky V. Posthumous reproduction guidelines in Israel. Hastings Cent Rep. 2004;34(2):6–7.
22. Barton SE, Correia KF, Shalev S, Missmer SA, Lehmann LS, Shah DK, et al. Population-based study of attitudes toward posthumous reproduction. Fertil Steril. 2012;98(3):735–40.

Part VI

Religion and Third-Party Reproduction

Hagar's Child: Theology, Ethics, and the Third Party in Emerging Reproductive Technology

19

Laurie Zoloth and Alyssa A. Henning

Now Sarai, Abram's wife, had borne him no children. But she had an Egyptian slave named Hagar; so she said to Abram, "The Lord has kept me from having children. Go, sleep with my slave; perhaps I can build a family through her." Abram agreed to what Sarai said. So after Abram had been living in Canaan 10 years, Sarai his wife took her Egyptian slave Hagar and gave her to her husband to be his wife. He slept with Hagar, and she conceived. When she knew she was pregnant, she began to despise her mistress. Then Sarai said to Abram, "You are responsible for the wrong I am suffering. I put my slave in your arms, and now that she knows she is pregnant, she despises me. May the Lord judge between you and me." "Your slave is in your hands," Abram said. "Do with her whatever you think best." Then Sarai mistreated Hagar; so she fled from her. The angel of the Lord found Hagar near a spring in the desert; it was the spring that is beside the road to Shur. And he said, "Hagar, slave of Sarai, where have you come from, and where are you going? "I'm running away from my mistress Sarai," she answered. Then the angel of the Lord told her, "Go back to your mistress and submit to her." The angel added, "I will increase your descendants so much that they will be too numerous to count." The angel of the Lord also said to her: "You are now pregnant and you will give birth to a son. You shall name him Ishmael, for the Lord has heard of your misery. He will be a wild donkey of a man; his hand will be against everyone and everyone's hand against him and he will live in hostility toward all his brothers. She gave this name to the Lord who spoke to her: "You are the God who sees me," for she said, "I have now seen the One who sees me." That is why the well was called Beer Lahai Roi; it is still there, between Kadesh and Bered. So Hagar bore Abram a son, and Abram gave the name Ishmael to the son she had borne. Abram was 86 years old when Hagar bore him Ishmael.

Genesis 16

Introduction

Every gesture is a moral gesture, and every moral gesture, every decision, creates a narrative that is at once personal and public, at once unique and taken within a tradition of human moral activities. Nowhere is this truer than in reproductive medicine, with no tradition stronger or more closely held than traditions of religious practices. Thus, emerging reproductive technology has become the subject of primary ethical attention and concern for religion. For the three Abrahamic religious traditions of Judaism, Christianity, and Islam, the story of Hagar, the young slave used as a surrogate mother to Abraham's firstborn son Ishmael, is the shared ground for the first family of faith, and it is full of drama and tragic necessity. In the Hebrew Scripture, as noted above, the effort to create a child outside of the usual narrative

L. Zoloth, Ph.D. (✉) • A.A. Henning, MA
Department of Religious Studies, Northwestern University, Crowe Hall, 1,860 Campus Drive, Evanston, IL 60208-2164, USA
e-mail: lzoloth@northwestern.edu

J.M. Goldfarb (ed.), *Third-Party Reproduction: A Comprehensive Guide*,
DOI 10.1007/978-1-4614-7169-1_19,

of marriage does not go happily, and for Muslims, the plight of Hajar (Arabic for Hagar) is central to the Hajj, the required pilgrimage to Mecca. Hajar's frantic search for water to maintain her son, after they are cast out and left in the desert, is one in which she runs back and forth seven times between two peaks, Al-Safa and Al-Marwah. This physical act of desperation is replicated by the pilgrim at Mecca who must use his/her body to reenact the seven circuits in the desert heat, running up and down the hills. The drama of the third party is repeated, reenacted, and respoken so powerfully in these traditions that it clearly raised the question, "why?" In an historical era in which disempowered slave women were commonly seen as property, why was the text so attentive to the problem of the use of these women as mothers? It is a core question for scholars who seek to understand the positions of contemporary religious traditions and contemporary third-party reproductive projects, for such core foundational narratives capture the desperation, frustration, and infinite yearning of infertility *and* the ethical problems with the use of the body of another in the service of so central a human activity as childbirth. This chapter will briefly review some of the ethical and theological concerns of a number of traditions as they considered third-party reproduction.

Definitions and Terms

Third-party reproduction concerns the use of any body part of a "third" party to the act of heterosexual intercourse that biologically creates a pregnancy within the womb of a woman who will gestate and give birth to a child. In some religious traditions, the "third" can be the presence of a physician who assists parents in conception. We typically understand the term "parents" of a child as the people who have sperm and oocytes that are combined within the body of the woman in this heterosexual act of, at least, intimacy and, hopefully, sincere love. This is the understanding of all religious traditions, which, from antiquity, have considered this also the act that defines the sexual relationships sanctioned and made sacred by the promises, contracts, and protections of marriage. The narrative of marriage, promises, and sexual intercourse that resulted in children from that marriage has been the desiderata of most religious practices that valorize family and pro-natalism, and infertility was understood as the most profound of tragic fates. Marriage has changed in this historical era, and biology has not, but science has changed perhaps most of all. This primary narrative now can be disaggregated: thus, children can be created as if assembled, using eggs, sperm, and a woman's body (for 9 months), from completely different persons, and then be raised by another set of adults as her/his parents. Every variation of this narrative turn can be described as "third-party reproduction." For the purposes of this chapter, we will consider three aspects: gamete exchange, embryo exchange, and the use of surrogates as gestational mothers.

Let us say at the onset that nearly every single religious tradition in the United States either prohibits or severely restricts third-party reproduction. None valorize it, although some permit a limited use in some circumstances. We will explore why there is such deep unease at the practice emerging from religious communities.

Why Religion? First Answer

Since the early 1990s, American scientists have been asked to incorporate ELSI (ethical, legal, and social implications) research into their projects. Ethical and social implications are deeply intertwined with religious traditions and communities. Religious perspectives and the arguments derived from religious texts and communities may contribute to public and scholarly bioethics discourse in a variety of ways—both practical and theoretical—depending upon the discussion's goals. Physicians and clinical researchers, who will encounter families with a diverse set of norms and customs, will benefit practically from basic knowledge of and familiarity with religious perspectives in at least two ways. First, familiarity with even the most rudimentary religious beliefs may help clinicians better understand and negotiate the dynamics of each physician–patient

relationship. On the most straightforward clinical level, medicine requires beneficence. But this requires a shared sense of "the good," a task that is impossible without a frank discussion of essential notions of morality. Understanding a patient's religious commitments is one critical part of this task, so that physicians and family members may better communicate with a patient who draws upon religion to cope with an illness or make decisions about medical care. Such patients are not uncommon in American life. According to the Pew Center on Religion, Americans have come to understand the tragic choices of illness as a crisis within religious traditions, often even if they have not been involved with religion prior to their illness.

Additionally, awareness of religious perspectives may assist in shaping the clinical encounter and therapeutic agenda in a variety of ways. Physicians may be influenced by their own religious, ethical, and moral backgrounds when thinking about the types of illnesses they will study and treat and the methods by which they are willing to treat them. For example, clinicians may turn to their religions for guidance when deciding to use third parties at all in an infertility practice, or under what conditions. Additionally, knowledge that a particular religious community lacks an ethically acceptable treatment for an illness may motivate researchers to focus on developing alternative treatments that could be utilized by patients in that particular community.

Religious perspectives also facilitate theoretical conceptualizations of the ethical questions that ought to be considered as researchers, physicians, and patients move forward in any practical applications of the use of third parties in reproduction—be it gametes, embryos, or even surrogate mothering. A diagnosis of infertility challenges us to ask questions about our conceptions of, and the meanings we ascribe to, illness, healing, mortality, family, children, and suffering. Different religions may identify different questions raised by new technologies and relationships as the most ethically pressing. These questions may further differ from the questions that dominate secular ethical discourse. Thus, religious perspectives may direct our attention to questions we might otherwise overlook; they may also sufficiently shift a conversation's focal point to move discussion beyond a particular, ethically entrenched gridlock.

Religious and moral reasons may be the only ones powerful enough to challenge the voice of the marketplace, to question the power of cultural conventions of modernity, or to raise the importance of issues of justice and ultimate goals. It is the role of religions to think about the world to come—this is why, in large part, so many religions focus on the importance of fertility, and the disruption in the order of the world to come if illness destroys fertility.

Religious voices may claim different types of authority in a particular discussion, for example, over the decision-making processes of members of a congregation, denomination, or entire religious tradition; citizens of a country; or all human beings. Nonetheless, religious traditions and their varied sources can enrich and inform ethical discourse, with each religious tradition contributing multiple and complex points of view. It may even be that a particular argument from a religious tradition offers the most persuasive reason for proceeding in a particular way. To visit the arguments of religion is far more than an interesting tour of exotic communities. It is to understand some of the arguments that have shaped civilizations over the last 2000 years, arguments that have been morally persuasive over strong arguments from the market or other external social pressures. It is to these varied religious perspectives that we now turn.

How Religion? Considering the Legal and Ethical Texts on Comparative Traditions

The evaluation and assessment of medical research, particularly on the treatment of infertility, has largely been located in the internal literature of faith communities, and because so much of public policy is crafted in response to the popular and faith-inflected response, this chapter seeks to explain our preliminary reflections on

how different religious communities might use their texts and traditions to respond to and assess the ethics of third-party reproductive technology (TPRT) research and technologies. Specifically, this section will briefly explore the Catholic, Evangelical Christian, Muslim, Jewish, Hindu, and Buddhist traditions and their anticipated or potential contributions to the ethical discourse surrounding the limits of reproductive technologies.[1] The section will sketch a few characteristic principles that guide each religion's traditional stances toward reproductive technologies and procreation as cases about such interventions emerge in the disparate communities and as practitioners raise the question in local settings and with larger national bodies. In previous work in this area, we noted that because religious communities exist in cultural and historical contexts, in general, while principles and stances derived from religious sources often emerge from formal documents, these may not represent the fullness of the actual practices of many individuals who identify with a particular religion. Additionally, each of the traditions discussed is part of a much larger religious tradition containing multiple denominational, congregational, and geographic subgroups with varied relationships to the more general positions outlined in this chapter. The core of the section outlines suggestions for considering possible contributions of each religious perspective to broader ethical discussions. Any scientific enterprise, but especially one concerned with the creation of families, will benefit from the broadest consideration of the arguments made by multiple traditions and viewpoints, particularly when these varied insights are brought into dialogue with one another. We contended that bioethics is a reflective and reflexive conversation and operates best when the discourse is enriched by arguments that extend beyond the considerations of the market or the curiosity of research scientists.

[1] This section is based on work done to explore the problem of oncofertility, done over several years with research contributions from a large set of undergraduates. The Zoloth-Henning chapter, which addresses the use of still-developing fertility-preservation technologies in the special case of cancer patients, can be found in Woodruff TK, Zoloth L, Campo-Engelstein L, and Rodriquez S, eds. Oncofertility: ethical, religious, legal, social, and medical issues. New York: Springer; 2010.

Catholicism

Vatican documents convey the Catholic Church's official teachings on a variety of issues, including reproductive technologies and bioethics. Vatican documents provide a framework for thinking about the cascade of technologies that use the bodies of others in the treatment of infertility. In 2008, the Vatican issued "Instruction *Dignitas Personae* on Certain Bioethical Questions." *Dignitas Personae* builds upon earlier Vatican documents, most notably "Instruction *Donum Vitae* on Respect for Human Life at its Origins and for the Dignity of Procreation" (1987), but also the Encyclical Letters *Humanae Vitae* (1968) and *Evangelium Vitae* (1995). *Dignitas Personae* acknowledged the suffering felt by infertile couples who desire children, recommending encouragement of adoption, but also of "research and investment directed at the *prevention of sterility*" [1]. *Dignitas Personae* lists three "fundamental goods" that act as guiding principles that must be respected when treating infertility: First, from the moment a sperm and an egg unite to form an embryo, that embryo is entitled to the same rights to life and physical integrity granted to all human beings. Second, partners in a marriage may only procreate with one another. Third, procreation must result from sexual union between husband and wife [1].

These guidelines place many restrictions on procreation and specifically prohibit the use of assisted reproductive technologies (ARTs), thus not only ruling out surrogate reproduction, or using the gametes of another, but also any creation of pregnancy by ART. For the Vatican, infertility can only be corrected by individual bodily interventions, like unblocking fallopian tubes or adjusting hormones.

In summary, for the Catholic Church, the act of procreation is really about the creation of families within marriage vows taken as part of one's

personal discipleship, and in accordance to obedience to God, any use of the body of another person is religious insensible and is not permitted.

Evangelical Christianity

When exploring Evangelical Christian insights into the ethics of TPRT, it is important to bear in mind Allen Verhey's observation that "there is no unanimity about what an 'evangelical' is, not among those who apply the term derisively nor among those who accept the label happily" [2, p. 77]. However, Verhey *did* identify three characteristics that apply to evangelical groups, whichever way they are defined: "the primacy of the Bible and its authority, the importance of a personal relationship to Jesus the Christ as Savior and Lord, and the necessity of living one's whole life in the light and power of the good news, the evangel" [2]. Alternatively, David Bebbington applied the following four characteristics to Evangelical Christianity: "conversionism, the belief that lives need to be changed; activism, the expression of the gospel in effort; biblicism, a particular regard for the Bible; and crucicentrism, a stress on the sacrifice of Christ on the cross" [3]. The National Association of Evangelicals (NAE) boasts 60 denominations as members [4]. Consequently, Evangelical Christian interpretations about TPRT may vary among denominations and even among congregations within a single denomination. Drawing upon perspectives from within the Assemblies of God and the Southern Baptist Convention will help demonstrate the effect of this diversity on Evangelical Christian assessments.

The Assemblies of God and the Southern Baptist Convention share three guiding values that are particularly relevant to discussions about TPRT. First, both denominations emphasize the literal or plain meaning of Scripture, which includes the Old Testament and the New Testament. Second, both denominations uphold the belief that human life begins at the moment of conception—the moment sperm and egg unite to form an embryo. Finally, both denominations teach that reproduction and procreation should only occur in the context of a marriage between one man and one woman. Yet despite these common principles, Assemblies of God and the Southern Baptist Convention sometimes reach different conclusions about the ethics of ARTs.

Although it has not issued an official stance on whether and how it is appropriate to attempt to overcome infertility, the General Council of the Assemblies of God has expressed "concern that procedures tampering with the human embryo… have the potential to circumvent the sovereign will of God." Recourse to medical solutions is not prohibited; however, medical interventions should only be utilized after prayer determines that it is God's will that the couple turn to reproductive medicine. Couples facing infertility are encouraged to ask "church leaders…to pray over and with them" that they will naturally conceive; persistent infertility should occasion further prayer, to determine whether God's plan for the couple involves a mission or task they could not accomplish with children. If no higher purpose for the infertility is determined, "surgical repair of blocked or damaged fallopian tubes or the careful administration of drugs to stimulate ovulation (when physical problems can be corrected by these means) would seem acceptable." Assisted reproductive technologies (ARTs) must only be used to initiate a pregnancy within the context of marriage; technologies that involve a third party in the procreative process, such as artificial insemination by donor or the use of a gestational surrogate, are considered violations of the marital bond [5].

Christina H. M. Powell, an Assemblies of God pastor and trained research scientist, identified three principles that should guide decisions about the use of reproductive medicine: "respect for the beginning of human life," "respect for the marital bond," and "respect for the needs of the next generation" [6]. Powell expressed ethical concerns about in vitro fertilization (IVF) because it separates the moment of conception from the loving sex act of a married couple but also because it makes preimplantation genetic diagnosis (PGD) possible; PGD does not adequately respect new life as a gift from God [6]. Using donor eggs, donor sperm, or gestational surrogates is also morally

suspect, because it introduces third-party involvement in an act that is supposed to occur between—and *only* between—husband and wife. Assemblies of God churches interpret the biblical story of Abraham, Sarah, and Hagar as a cautionary tale about the relational stress and dangers that can result from surrogacy [5, 6]. Posthumous reproduction, which removes procreation from the marital sex act *and* deprives the child of one of his or her genetic parents, is also ethically problematic because it violates the principles of respecting the marital bond and respecting the needs of the next generation. Powell cited Romans 7:2, "For example, by law a married woman is bound to her husband as long as he is alive, but if her husband dies, she is released from the law of marriage," as "clear [proof] that the marital bond dissolves at the death of one's spouse" [6]. She also noted that although a child's birth after the father's death has always been a possibility, posthumous *conception* is comparatively novel and especially problematic [6]. Thus, patients belonging to an Assemblies of God Church may be particularly concerned about ensuring that their cryopreserved gametes are not used to create a child after they or their partner die, and the Church or its members might advocate universally banning the use of cryopreserved gametes or tissue samples for posthumous reproduction.

Southern Baptist discussions about ARTs, in contrast, do not express much concern about separating procreation from a married couple's sex act. While the use of donor sperm, donor eggs, or gestational surrogates may be ethically problematic, using donated embryos does not appear to be prohibited. Information about "embryo adoption"—whereby one couple adopts and gives life to another couple's "leftover" embryo—is available on the Southern Baptist Convention's official website [7]. Southern Baptist concerns about IVF center upon the destruction of excess embryos. This moral apprehension is highest with regard to couples who turn to IVF *despite* knowledge that each IVF cycle usually involves creating more embryos than will be implanted [8, 9]. The large numbers of frozen embryos already in existence may prompt the Southern Baptist Convention to encourage members to "adopt" embryos otherwise destined for destruction.

One contribution to discussions of TPRT that comes from within Evangelical Christianity is the Assemblies of God's notion that reproduction and procreation are not necessary for living fulfilling, purposeful lives. In particular, the notion that God may assign couples tasks that they cannot accomplish unless they do not have children introduces an interesting alternative to two divergent attitudes, both of which may make the communal or societal lives of childless couples difficult: (1) that infertile couples remain childless because God is punishing them and (2) that couples who choose not to have children, especially despite technological advances that might provide reproductive success, are necessarily selfish or self-absorbed.

Islam

Islam can be divided, at a minimum, into two main schools of thought: Sunni and Shi'ite. In his testimony before the United States' National Bioethics Advisory Council, Abdulaziz Sachedina cautioned that the Sunni majority and Shi'ite minority "do not represent an Orthodox/Reform divide" [10, p. G-3]. Sachedina suggested thinking of both Sunni and Shi'ite Islam as "'orthodox' in the sense that both base their arguments on the same set of texts that are recognized as authoritative by all of their scholars" [10, p. G-3]. These texts include the Qur'an, understood as the direct word of Allah (God), and the Sunnah, examples from the Prophet Muhammad's life included in scripture [11]. "Nonbinding but authoritative Islamic religious proclamations called *fatwas*" [12, p. 431], issued by Islamic legal scholars, also belong to the textual milieu of Muslim bioethics.

It is difficult to identify monolithic opinions even within Sunni or Shi'ite Islam. Differences in opinion or practice may result from a particular religious community's geographic location or local custom. Community opinions and customs may also be influenced by whether the community is situated in a state that governs by Islamic law. *Ijtihad*, understood as "the law of deductive logic" [11, p. 73] or "a form of individual religious

reasoning," has led to a great diversity of opinion among Shi'ite Muslims in particular [12, p. 435].

Marcia Inhorn identified three main concerns driving ethical analysis and use of TPRTs in Muslim communities in Egypt and Lebanon: (1) marriage, (2) incest, and (3) kinship and family life [12]. Reproduction must occur within the context of a marriage, traditionally defined between a man and a woman. While artificial insemination using sperm from a woman's husband and IVF utilizing the egg and sperm of husband and wife to create embryos that will be implanted into the wife are both permitted, the use of donor eggs, donor sperm, donor embryos, or surrogates is considered adulterous according to Islamic law [11–13]. A 1980 *fatwa* issued by The Grand Shaikh of Al Azhar University in Egypt, still used as a guideline in much of the Sunni *and* Shi'ite Muslim world, is understood to permit embryo cryopreservation; however, neither partner may use the embryos after the marriage comes to an end, whether by divorce or the death of husband or wife [12].

Abul Fadl Mohsin Ebrahim argued that if infertility is considered a "defect" or "disease," then the statement attributed to the Prophet Muhammad, "for every disease there is a cure," would allow Muslims to turn to medicine to overcome infertility [13]. Muslim communities largely abide by the Qur'an's prohibition of "legal adoption" as it is known in the West (whereby a child takes his or her adoptive parents' surname and is treated as the adoptive parents' own child) [12, p. 441]. Inhorn observed that in the Muslim world, even when adoption is legal, it is often discouraged [12]. The prohibition of adoption is tied to Qur'anic passages that teach the importance of knowing one's personal familial lineage. As A. R. Gatrad and A. Sheikh succinctly stated, "Children have the right to be born through a valid union (marriage) and to know their parentage fully" [11, p. 73]. Inhorn noted that "preserving the 'origins' of each child—meaning [the child's] relationship to a known biological mother and father—is considered…a moral imperative" [12, p. 440]. Without knowledge of one's lineage, there is "potential for incest among the offspring of unknown donors," which is of great concern in many Muslim communities [12, p. 440]. Another concern, particularly in communities or states governed by Islamic law, is that children may only inherit from their biological parents. Thus, of course, reproduction must occur in the context of marriage and without the involvement of a third-party donor.

Islam's proscription of adoption invites reflection about the significance of genetics in the relationship between parent and child, and the ways that TPRT may change interpersonal relationships in different societies. Additionally, Muslim concerns about inheritance provide an important reminder of the challenges that new reproductive technologies may pose to our legal systems.

Judaism

Anticipating or formulating Jewish responses to TPRT research and technologies is complicated by Judaism's canonical inclusion of multiple, often conflicting, legal and interpretive positions. There are several distinct branches of Judaism: Reform, Conservative, Orthodox (including Modern Orthodox and Haredi/Ultra-Orthodox varieties), and Reconstructionist, each with their own rabbinic training programs and councils which offer arguments and policies to their respective congregations. Even within each of the branches of Judaism, a plurality of interpretations and stances is preserved as legitimate, though communal norms may affect which interpretations a particular community, congregation, or individual embraces.

Although each branch of Judaism ascribes different degrees of authority to Judaism's canonical texts—the Torah, Midrash, Mishnah, and Talmud—these texts form a common foundation of Jewish ethical discourse. Aaron Mackler delineated four guiding values in Jewish reproductive ethics: (1) "respect for persons," (2) "procreation," (3) "human stewardship," and (4) "healing," each of which can be traced to canonical texts [14, p. 321]. For instance, respect for persons derives from Genesis 1:28—which states that human beings were created in the image of God—as well as later rabbinic interpretations and applications of this concept [14, 15]. The value of procreation

also derives from Genesis 1:28—the first command God gives to human beings is to "be fruitful and multiply." Rabbinic sources thus interpreted procreation as a duty, albeit a duty for men, not for women [16]. Many female scholars of Judaism have noted the complex history surrounding women and reproductive duties, in which women are enjoined to respond to the crisis of infertility throughout the Torah narrative, but whose choices to do so are not necessarily considered normative. The halakhah preserves commentary about the need for limits on reproduction, on alternate ways of fostering children, and on the permissibility of nonreproductive sexuality. Additionally, Elliot Dorff asserts that "the commandment to procreate only applies to having children through sexual intercourse" [15, p. 399]. The duty to reproduce does not apply to infertile couples; Jewish law cannot obligate anyone to utilize ARTs [15]. However, some Jewish commentators and communities place an especially high value on procreation because six million Jews were murdered in the Holocaust, and thus some infertile Jewish couples may feel social or familial pressure to reproduce, even if they are not obligated by *halakhah*, Jewish law, to do so. Mackler describes human stewardship as "reverent but active partnership with God in completing the works of creation and improving the world," which is closely connected to the fourth value, healing, frequently understood as "[restoring] that which has been lost."

In Jewish law, unlike in Catholic and Christian legal constructs, embryos may be created and used as a part of infertility treatments and, indeed, as a part of stem cell research as well. This is because of two arguments. The first is that embryos created in the lab have a significantly different moral status than embryos created by heterosexual intercourse that are in the womb of a woman, because without elaborate manipulation, they would never be brought into personhood at all. And second, within Jewish law, embryos and even fetuses possess different—and increasing—moral statuses according to *halakhah*. Rabbinic literature describes a fetus less than 40 days old as "merely water." Contemporary halakhic interpretations thus do not ascribe moral status or rights to an extracorporeal embryo—which enables widespread Jewish acceptance of ARTs, including IVF and embryo cryopreservation [17].

Anxieties within Jewish scholarship center not on concerns about technology, but about the creation of families in a way that validates other norms. An important caveat to widespread *halakhic* and practical acceptance of ARTs is that reproduction and procreation is intended to occur within the context of marriage. Within Orthodoxy, marriage only refers to relationships between a man and a woman. The conservative and reform movements possess a variety of stances on same-sex marriage, ranging from rejection to approval of civil but not *Jewish* same-sex marriages to acceptance of same-sex marriages as Jewish. This generally means that ARTs should only be utilized by married couples, however defined. Some Orthodox authorities forbid the use of both donor sperm and donor eggs [15, 18]. The use of donor eggs is *halakhically* less problematic than the use of donor sperm, since the mother is *halakhically* defined as the woman who physically gives birth to the child, but the father is defined as the source of the sperm [18]. The Conservative and Reform movements are more lenient regarding the use of donor sperm, since, as Dorff explains, "the biblical ban on adultery is violated only when there is contact of the genital organs of the two people having the affair" [15, p. 394]. However, some Conservative rabbis require the husband's consent before donor sperm is used [18]. But Jewish law raised another issue: particularly in a small community, scholars and rabbis wondered if unknowing incest could occur. If one sperm donor was found attractive, he could theoretically genetically father dozens of children. After long debates, the use of third-party sperm and eggs was curiously permitted, providing that the gamete donor was *not* a Jew; thus, the theory was that the more "third party" the person was, and assuming that children raised in a Jewish home would be unlikely to marry a non-Jew, the less likely unknowing incest would be.

About surrogacy, there is a debate, largely focused on the technical legal problem of conversion. If the birth mother is a non-Jew, then the child is also not Jewish and must convert to be

Jewish. But what of the genetic provenance of the child? Does the use of the gametes of the couple in question render the child Jewish? This remains a dispute.

Hinduism

The colonial construction or "invention" of Hinduism as a unified religion makes it particularly difficult to talk about Hindu bioethics. Swasti Bhattacharyya, who has written about Hindu bioethics, cautions that "the term 'Hindu'…is a foreign label for a rough collection of related, yet quite diverse, social, religious, cultural, and philosophical traditions originating from within India" [19, p.5]. Nevertheless, because the term's introduction has shaped the self-identification of adherents to the many traditions that fall under the umbrella of Hinduism, and because these traditions share a textual canon and some common history, it may be possible to sketch a few principles and interpretations that, taken together, suggest the outlines of Hindu bioethics and demonstrate some common touchstones for Hindu bioethical discourse. Hinduism's sacred texts are of two varieties, revealed and traditional. Revealed texts include the *Vedas* and the *Upaniṣads*; among the traditional texts are the *Law Book of Manu* and two epic literary narratives, the *Ramayana* and the *Mahābhārata* (which includes the *Bhagavad Gītā*) [19]. In her exploration of Hindu bioethics, Bhattacharyya suggested an ethical framework grounded in the traditional literature, especially the *Mahābhārata*, for thinking about ARTs and TPRTs [19]. In particular, she drew upon three "birth narratives" that describe the efforts by which Kunti, Mādrī, and Gāndhārī, three queens, ensure that they will have children and that the Bharata family lineage will continue. Bhattacharyya argued that

> the epic…reflect[s] a shared experience in the struggle against infertility and a shared attitude of openness and creativity towards procreation. Trying to fulfill their desires to have children, the narrative depicts how the three queens overcome major obstacles by utilizing creative and magical means. Today, the creativity is expressed through various forms of reproductive technology [19, p. 3].

Within these narratives, Bhattacharyya identified practices of sperm donation, including postmortem sperm donation; gene selection; adoption, including adoption by which one wife becomes the mother of another wife's children; artificial wombs; and "paternal surrogacy," a phrase she uses to describe acts in which a married woman has sex with another man or a god in order to provide that union's offspring as an heir for her husband [19].

Bhattacharyya identified six characteristics that pervade Hindu thought: "(1) an emphasis on the centrality of societal good; (2) a firm belief in the underlying unity of all life; (3) the expectations and requirements of *dharma*; (4) the multivalent nature of Hindu traditions; (5) a theory of *karma*; and (6) a commitment to *ahiṃsā* (no harm)" [19, p. 63]. From these characteristics, it is possible to derive principles and concepts that shape a Hindu bioethics. These include, but are not limited to, (1) the importance of having children, including the importance of having a son; (2) a broad notion of family; (3) the value of family planning; and (4) that ethical considerations should focus on the specific details of individual cases. Hindu tradition divides the human life into four stages: student, householder, "forest-dweller," and renouncer. The *Law Book of Manu* identifies the householder stage, which entails "establishing one's economic stability, getting married and having children," as the most important, because the householders support society's students, "forest-dwellers," and renouncers [19, p. 64]. Traditionally, individuals may not pass from the householder stage to the "forest-dweller" stage until they have had grandchildren—more specifically, grandsons [19]. Hindu tradition places great importance on childbearing. However, it would be inappropriate, according to this framework, to attempt to give birth to and raise children while one is in the student stage but also in the "forest-dweller" or renouncer stage. This notion—that childbearing and rearing should be limited to a particular, proper stage in the human lifespan—contributes a thought-provoking backdrop for addressing the issue of men and women who are past normal reproductive age and who want to use TPRTs to have a child.

There may be interpretations from within the Hindu tradition that not only permit but strongly encourage using ARTs to have a child, particularly when a couple has had difficulty conceiving, and especially to have a son. However, traditional Hindu conceptions of family extend beyond the nuclear family of parents and children to include aunts, uncles, and in-laws; adoptive relatives; grandparents; and close friends—even all the members of the town in which an individual was raised [19]. Additionally, because children need not be genetically related to their fathers to count as heirs, and because children may be considered sons (or daughters) even if they are not eligible to be heirs, members of some Hindu communities may be less likely to pursue the technological interventions at their disposal, since lineage does not depend upon a genetic tie between parents and children. Despite the fluid notions of family present in Hindu texts, however, anthropological studies suggest that childless women in India experience social stigma and decreased stability in household relationships [20]. Thus, women who can afford to utilize TPRTs may feel social or familial pressure to do so, especially since the varied and complex families presented in the *Mahābhārata* narratives seem to consider nongenetic and genetic children as morally and meaningfully equivalent.

Buddhism

Buddhism "is characterized by a devotion to 'the Buddha,' 'Buddhas' or 'Buddhahood,'" where Buddha not only refers to the historical Buddha but also operates as "a descriptive title meaning 'Awakened One' or 'Enlightened One'" [21, p. 3]. There are two main "styles" of Buddhism—Theravāda and Mahāyāna; Mahāyāna Buddhism includes multiple schools of Buddhism, such as Zen, Pure Land, and Tibetan Buddhism [21, 22]. The variety of schools, coupled with their development in so many different sociocultural settings, makes it difficult to speak about a singular Buddhist bioethics. Nonetheless, Peter Harvey suggested that the Four Noble Truths form part of a common ground for the many varieties of Buddhist ethics [21]. The Four Noble Truths teach that (1) life is ultimately unsatisfactory (*dukkha*); (2) life's unsatisfactoriness stems from desire (*taṇhā*); (3) enlightenment or nirvāṇa (*nibbāna*), what the Buddha himself had attained, is the elimination of desire and unsatisfactoriness; and (4) nirvāṇa is cultivated by following the eightfold path [23, p. 63].

Another important concept is *samsara*, or the cycle of rebirth, which Buddhists believe all living beings endure until they achieve enlightenment and break free from this cycle. The law of *kamma* (*karma*) determines the life into which any being is reborn: "beings are reborn according to the nature and quality of their actions" in their previous life [21, pp. 14, 15]. The effects of the law of *kamma* may also be felt in one's current life [21]. Shoyo Taniguchi described *kamma* as a natural law of "cause and effect, of action and reaction" [24, p. 77]. Buddhist concern for suffering and its alleviation is connected to the concept of *kamma*. Actions that harm oneself and/or others are "unskillful" actions; actions that either benefit or do not harm oneself and/or others are "skillful" actions [24]. Buddhists are encouraged to act skillfully and avoid unskillful (i.e., harmful) actions [24].

Buddhist ethics can be divided into two strands: monastic ethics and householder ethics [23]. According to Harvey, "Buddhism has traditionally held celibate monasticism in the highest regard, but it has also seen marriage and family life as highly suitable for those who cannot commit themselves to celibacy," although he noted at least one strain of Western Buddhism that is sharply critical of the householder lifestyle [21, p. 103]. The Sigālovāda Sutta, "a key text for lay Buddhist ethics, including sexual ethics" [23, p. 68], may be particularly relevant to Buddhist reproductive ethics and reflections upon TPRTs.

ARTs may alleviate the suffering some couples or individuals experience as a result of their infertility. Shoyo Taniguchi suggests that "as long as technology brings benefits to the couple who wishes to have a child, and as long as it does not bring pain or suffering to any parties involved, Buddhism would find no conflict in applying and using modern technology" [24, p. 80]. But some

Buddhist schools or scholars might criticize ARTs and specifically TPRTs for perpetuating the disillusioned attachment to this life that sometimes motivates human beings' reproductive desires. Although ARTs may remove the physical and bodily desires of sex from the reproductive process, the mental or emotional desire for a child can be equally problematic. Some monastic texts, such as the Vinaya Piṭaka, equate the desire for a child with the desire for wealth and economic security—desires which lead humans astray from the path to enlightenment [23]. Additionally, "the *Dhammapada* declares that delusion makes one say that one's body belongs to oneself or one's child belongs to oneself" [24, p. 78]. A genetically related child can no more belong to a parent than a non-genetically related child can. Some Buddhist thinkers may, therefore, eschew ARTs for exacerbating disillusioned notions about the parent–child relationship (which might, arguably, be harmful to both parent and child).

According to the *Mahātaṇhāsaṇkhaya Sutta*, human life begins at conception, understood today as the fusing of sperm and egg *and* the embryo's animation by a soul that was awaiting rebirth [22, 24]. Since it is impossible for humans to determine whether a soul is present in a particular embryo, concerns about avoiding unskillful actions might encourage erring on the side of caution and treating all embryos as though they contain a soul; embryos thus have a right not to be harmed [24]. Disposing of leftover embryos at the conclusion of an IVF cycle is, therefore, ethically problematic; additionally, Damien Keown has suggested that embryo research would be unacceptable because it subjects embryos to harm and/or destruction without their consent [22]. Keown also argued that freezing embryos is problematic since so many embryos do not "survive" the thawing process [22, p. 137]. Buddhist principles would seem to require fertilizing only as many eggs as will be implanted in a particular IVF cycle, including, of course, TPRT cycles.

Buddhism can contribute to larger discussions about fertility by challenging the tendency, so prevalent in the west and latent in the drive to develop new infertility treatments, to privilege biological over nonbiological offspring. Additionally, Buddhist ethics emphasize harm as the yardstick against which an action's morality is measured. The relevance of motivation to determining whether an act is harmful—for instance, procreation as an attempt to "possess" offspring or satisfy the physical desire to experience pregnancy would likely be considered harmful—may refocus discussions about reproduction and TPRTs in an important way. Rather than focusing solely on the fact that there are patients who have expressed interest in fertility preservation, Buddhism may encourage exploring and reflecting upon the motivating factors that drive patients to pursue TPRTs as well as the effect these motivating factors may have on society as a whole.

In summary, this is a brief introduction to six religious traditions and their potential contributions to discussions about the ethical issues surrounding the use of third-party reproduction. Each religious tradition discussed herein—Catholicism, Evangelical Christianity, Islam, Judaism, Hinduism, and Buddhism—contains multiple and distinct perspectives. These viewpoints can complement, converge with, or challenge the philosophical, psychological, anthropological, medical, and legal perspectives included in discussions of bioethics. In the next section, we will turn from the specific ethical and legal texts to the theological claims that religion makes on societies and persons.

Why Religion? Part Two

This section delivers on the promise to explore the theological issues behind the larger project that uses the bodies or body parts of persons to create a child outside the act of heterosexual intercourse: third-party reproductive technologies, or TPRT. For the purposes of analysis, we can say that there are three sorts of problems. First, there are the philosophical and moral issues that arise when any third party, male or female, is used (issues such as the question of adultery, as noted above, or the problem of strangers as parties to an intimate act).

Second is the discrepancy in the involvement of males and females in TPRTs. Using the

gametes—the sperm—of a man is usually possible after said man has a pleasurable experience in exchange, resulting in an orgasm prior to obtaining his gametes. In contrast, a woman, to be a "third party," either must bear and give birth to a child, perhaps the single most important embodied event in a human life, or must undergo up to several weeks of hormonal injections followed by a minor surgery to extract her eggs for use by another person.

And third, in most cases, the acts of exchange are not acts of love or altruism. Most of these women are paid rather large sums of money. These women may not be able to garner such sums for any other labor exchange. This may result in a social gradient in which TPRT could tend to be a practice of the poor being paid to participate as "donors" to wealthier recipients. It is the context that raises the deepest ethical and theological questions.

The idea of compensation for any exchanges of third parties in reproduction has its origins in two sorts of arguments. The first argument, deconstructionist in its nature and postmodern in its sensibilities, is that all acts can be separated, including acts such as marriage, mothering, and friendship. This is true for many things; separation is at the heart of industrialization and production. We allow for this, and the move to then pay for the acts one cannot do oneself becomes logical as well. In this, a free-market system is used—one can exchange one's labor or goods by setting one's individual value and voluntarily exchanging it for something one values more. The second argument is that a fair price can be found, and that a free market of fair exchange has grown successfully along with industrialization. The argument that State or Church consideration and regulation are needed for all exchanges to make them just has lost its potency. The values of personal agency and personal responsibility for exchanges after a full exchange of information is given are now widely considered a reasonable system of justice. This argument is grounded in the classic defense of liberal theory in political philosophy as follows: (1) property and the rights it establishes, including the primacy of private decision making, result from the use of the natural world by personal choice and achievement; (2) persons stand as moral strangers to one another and make decisions as individuals, not as members of families, communities, or kinship groups; and (3) the way we deal with exchange is to maximize it by protection of boundary disputes only; this is done via neutral contracts in which all are theoretically equal partners, without regard for differences in class, race, or gender, which create very different access to power, language, and social capital. This is valid liberty-based reasoning. And, to be sure, it is the basis for much of the bioethics done in the United States—many core principles of the field are defined by autonomy, by the idea that a person in American U.S. law is described as possessing a "a bundle of rights" relating to their property, including their bodies, and by the human subject rules that allow informed consent and refusal between the strangers in the clinic. Defenders of the idea make the following logical claims: we allow women to sell their labor and we do not want the terms of that basic sale to be overly regulated. While well-off women in American may decry this practice, one wonders how it is that the one thing that women actually could have that is highly valued is suddenly the very thing that we decided has to be freely given? Why, goes this argument, is it morally justified to sell one's loving capacity for care of the ill but it is not morally justified to get paid for one's time to have eggs harvested, or to carry a pregnancy for a limited time, and use the payment for this act to support one's children and/or even to be financially independent? We know that the sale of labor, at whatever task is needed, despite the risks if they are freely undertaken, should be available to all, and that is why we argue that we must hire women to work equally. We allow women to sell not only their labor as, say, cab drivers, but we hire nannies for children and nurses for the elderly—all tasks that are not only the work, but were, historically, the shaping moral gesture of women—and of humanity itself. If we regulate and constrain some aspects of all trade, and all aspects of some trade, cannot we similarly do it with eggs? We want justice in the market, transparency in trade, and noncoercive contracts. This question is

inflected as well by the perception of coercion and the construction of duty, for many feminists have argued that women already are too readily reduced to reproductive commerce. But libertarians will argue: Why is this immoral, as long as it is a free and informed choice?

Since our sense of morality, goes this argument, is also so disaggregate and diverse, isn't individual freedom the only relevant factor? Of course, if one adheres to this argument, then logically there should be no restraints on payment, or limits on amount, allowing the full forces of the market to operate.

It is the power of these ideas and the yearning for children that create the need for moral consideration and justifying arguments. We believe that many of the arguments made that allow for limited compensation are thoughtful ones that need more research and exploration. There is a sense, of course, that the arguments that are made to allow women to take individual responsibility, and ensure the widest situation of liberty to enact that responsibility for choices for her own body, are the core to the liberal democratic state.

A Different Set of Considerations

It is widely understood that the free and self-regulating market is a moral enough terrain for many important human exchanges and that many exchanges in medicine can and do happen in a responsible market. Further, it has been the case that the liberty argument, if fully extended to women, should allow for payment for her gametes, and for a price, if the rules of the market are followed, and if she believes that it is a fair exchange. Should this be adequate? We argue that it is not. We seek to raise a different sort of voice in these debates—it is perhaps oddly philosophical or theological, and the authors are fully aware of this difference, emerging in the appendix of a policy document. Such a voice would argue that the key framing premise is not only freedom, or scientific need, but also this: we struggle to live together in a tragic world with decency and justice. *How ought we to live*?

What is meant by such a claim? First, that the world is "tragic" in a philosophic sense: flawed and full of obvious human suffering and unfairness. Second, it is tragic in a theological sense: in that it is possible to turn away from such suffering and that duties turned away from make the world *more* unfair and unjust. It is in such a world that we set this problem, not an ideal world, and not the limited world of the university research lab, in which so many of us are privileged to work. We are led then to ask reflectively: What is proper to give? What is fitting to receive? How are gifts given? How are exchanges made? What is a donation? How does the activity of exchange change the parties in the exchange? *For what can one hope*?

The question is then not whether free markets are inherently evil—they are not—but whether societies can decide if there are some acts, goods, or services that lie outside the market's sphere and whether the use of the body of another in reproductive technology, when it is a marketplace transaction, is such an act. This may be understood as a decision driven by two sorts of reasons. The first is that payment for activities done in the context of financial motives changes the nature of moral activity *itself*. Thus, there are many acts that can be disaggregated and could be theoretically exchanged for payment but become altered, sometimes so altered as to be merely troubling, and sometimes so altered as to be morally impermissible, when done for money or other forms of inducement. The amount of money paid is not the issue in these cases; it is the coupling of an act that in its original form arises out of a moral duty or human necessity with any amount of money that is troubling. Examples include the disaggregated role of "wife," in which payment for sexual services is impermissible, as is wet nursing, but payment for acting as a nanny, housecleaner, and cook is permissible; the disaggregated role of "citizen," in which the act of service to NIH or the army can be paid, but the act of voting cannot; or the disaggregated role of "neighbor" or "believer," in which psychotherapists or coaches or clergy may be paid, but the act of friendship, love, or devotion cannot. Verhey notes "that the morality of the marketplace provides only a minimal account

of human goods and of the means appropriate to achieve them and [its] morality is insufficient to human procreation and to the practice of medicine."[2] He adds,

> "Some things are not to be commodified and commercialized. There are boundaries and limits to the sphere of the marketplace. Michael Walzer calls these points at which we have limited the sphere of the marketplace 'blocked exchanges.' He regards these limits on the sphere of the market as no less important to social justice than 'blocked uses of power,' or limits on the sphere of the state."[3]

Blocked exchanges are erected for similar reasons—that societies are attentive to the use of power, especially in relationship to the poor.

The second reason is whether some acts are so important to us that they simply do not have a price: they are priceless, in that they require supererogatory acts, or have extraordinary cultural or moral worth, such that nothing could be valued more.

Justice and Moral Casuistry

When a woman exchanges her eggs or the use of her body for an infertile woman to use in TPRT, the woman is generally doing this for a combination of reasons that include supporting the idea of giving other women a chance for motherhood as well as for financial compensation. Obviously, some may participate predominantly for one or the other reason. In any case, external regulation is needed.

In the United States, the FDA regulates the medical aspects of TPRT. However, the other aspects of TPRT tend to be regulated by the profession itself. For example, the American Society for Reproductive Medicine (ASRM) has provided guidelines for payments to egg donors. However, there have been many cases of "marketplace regulation only," with advertising, bidding on the Internet, and recruitment inducements for eggs from higher-status women (reported to be as high as $50,000). However, for the most part, the "rate" for egg "donation" has stabilized in many American cities at $5,000 to $10,000 per cycle. Using eggs from women in India to make embryos and using Indian women as surrogate gestational mothers due to lower costs are already common enough practices to be noted in The New York Times.

Action as Moral Citizenship

Many criticize payment to egg donors and gestational carriers, comparing this to what they feel are similar unpaid acts.

We rightly valorize acts of healing, blood and organ donation, and other acts of moral witness and action in the face of suffering. For such priceless acts, one receives priceless reward: the incentive and the compensation are the grace and privilege of moral citizenship, the sense of duty fulfilled, and the actual satisfaction of being a part of a large, community-based moral gesture, one in which the many acts of individuals can make a difference in the progress of knowledge and eventually, with luck and skill, the act of healing itself. It is an act of utter and complete hospitality, and for such acts, there is really no price that could be met by any researcher in any lab. We delineate these acts of embodied hospitality as outside the market, regardless of the level of risk—donations of blood, organs, and gametes.

Moreover, payment is avoided in these cases because of our sense that we may well create "contracts of adhesion," contracts that are unfair because of the relative disadvantage of one of the participants, especially the inability to set or negotiate the contract's terms. Care needs to be taken in all of our case-based reasoning not to argue from the "is" to the "ought," either in nature or in social policy. Care needs to be taken to seek the proper metaphor for the act. Following Baruch Brody, we normally follow the idea that no one appeal (e.g., autonomy) trumps others (e.g., beneficence), and that we use casuistry in all debates in a pluralistic society, in which the moral appeal assumes varied importance as the actual facts of the case differ.

[2] Verhey A. Commodification, commercialization, and embodiment. Women's Health Issues 1997 May/Jun; 7(3):133.

[3] Walzer M. Spheres of justice: a defense of pluralism and equality. New York: Basic Books; 1983, p. 88–102, as cited by Veheys, op cite.

The Context for Rare and Protected Acts

The above concerns regarding payment to egg donors and gestational carriers justify the concerns that use the bodies of others in the reproductive context and use money to give an incentive to do so are heavily fraught with ethical problems. IVF clinics are indeed vexed with problems of the just exchange of eggs, egg "donation," and use of gestational carriers.

This use of the body of the other to achieve a clinical end is not unique in medicine, of course: clinical trials continue to struggle with issues of fair use of subjects in the developing world, and organ selling has a robust black market. But TPRT is rendered problematic because of the coincidence of many factors, including unknown risk to the women whose eggs are used, risk to the women whose bodies are used, unknown risk to the children conceived, and the social and cultural nature of the embryo. These factors create the sort of relevant difference that matters a great deal in justice theory. In fact, the freedom of offering one's body or its parts may be an illusory freedom for persons with limited choices. The arguments for payment clearly come from a call for the liberty of the marketplace—but many have argued that such liberty is an illusion; thus, as Kant noted, all desire, all pleasure, all pursuit of happiness, may be illusions, and our sophisticated analysis of culture, both popular and traditional, surely deepens our concerns that the consumer-based freedom as constructed and defined here is what is given in lieu of other, deeper choices.

The Person as Mere and Considered Means

In thinking about TPRT, especially in the context of American health care and the use of compensation for these exchanges, we are given to ask: how does this act shape the sort of future we wish to create? Kantian theorists urge caution at this juncture. If the arguments of freedom and moral agency apply here, in what cases would they not apply and why? What can be disaggregated and used? Is the entirety of the free body defined by its ability to be freely sold?

For if the act is understood as a fiduciary one, an exchange of needed and valuable tissue that we compensate, then the arguments noted above are sound. In particular, we think that the appeal for women to have the final say in the provenance of their eggs is an important one in liberty- or rights-based social interactions. A pure liberation argument—in some cases these can be the most appealing—would allow a woman to sell or rent any part of her body. In nearly all societies, the state intervenes in this right. Feminists are arranged on both sides of this debate; for some it is the embodied choice that is most important to preserve, yet others question where this choice can ever be made freely. The feminist critique would remind us that there is a strong social gradient that has emerged over the 30 years of third-party reproductive techniques, and that by its nature, poorer, younger men and women are more likely to "donate" gametes and gestate babies, and wealthier couples/individuals are more likely to receive them. Feminists see in this not only the reification of class lines but also the commodification that is so often a part of these exchanges. Much of this can be ameliorated and contained by the rigorous process that the guidelines insist upon, but certain features cannot. Some feel TPRT is reminiscent of prostitution in its most literal form when compensation is offered.

The Substance of Other Moral Appeals from Faith Traditions

Here we return to religion for two appeals for consideration. The first emerges from theological concerns, not liberty-based ones, for these are the appeals that seek moral activity and use other means to reward such activity. Many religious legal systems, for example, prohibit "unjust contracts" or any exchange of goods in which persons with more power contract with the powerless, and many offer special advantage and protection to the poor. Religious systems understand that the authenticity of an act is altered when it is paid.

Indeed, in most religious systems, it is love, forgiveness, or generosity that trumps over the marketplace. Buddhist and many Christian denominations urge a form of radical poverty as a means to just behavior. Here, all parties in the relationship would be guided by the model of charity put forward as a goal.

It is the premise of many faith traditions that the ideal relationships are driven by motivations that emerge from bonds derived from deeper community relationships. In this, the values of altruism and hospitality are foremost. We believe that these bonds, including bonds forged within the family, friendship, or faith or other communities, ought to be the primary source of reward and compensation. In such relationships, it is understood that there is a need for sacrifice for dear things, and this can clearly be understood—and has been in the case of other true donations—as the acts that support research and treatment.

A theological concern is not what is owed to us, but what is asked of us—setting in place a relationship that is really the core of the relationship of all medicine and all research: that without the body of the other, nothing actual can proceed. Allowing everything to have its price cannot be the only metric of bioethics, even if the price is fair, and the marketplace reasonable and clean, for some moral acts ought not to belong in the marketplace at all. That the procurement and exchange of body parts for financial compensation exists at all is an artifact of the history of infertility treatments in which the first negotiations were conducted—it is not a moral argument.

The arguments for duty need not only arise from faith traditions: they arise from the nature of our existence in a social world in which we have duties to attend to the happiness and the suffering of others. This is what Kant would note is an argument from the causal and sensible world, one whose tangible plainness may not be entirely persuasive historically, so Kant notes that we have a "dual citizenship" in the intelligible world, the world of rational acts, which constructs moral order. We must, he argues, have a categorical imperative to beneficence—to help if we can—and not for ends or reward.

A second consideration arises from the attention that many religious moral philosophers have given to the stranger—and the particular sort of stranger that women and children are. Texts of antiquity did not envision a woman exchanging her oocytes for payment, to be sure, but they did consider the case of widows and orphan children who might be tempted to sell their bodies into slavery. Elaborate consideration was given to protect the stranger—one might argue that much of the core of the Hebrew Biblical text, the New Testament, the Qur'an, and the mendicant tradition of Buddhism are given over to the regulation and praxis of the duty toward strangers. That the stranger relationship between egg donors and egg receivers has often been best described as a relationship between the poor and the well off alerts us to the terrain in which faith communities traditionally operate—the protection of the poor and vulnerable stranger from any possible exploitation. The care of the stranger is mediated, in many cases, not only by religious law but by the concept of reversibility—that one has been and could be again in precisely the same position. That this is not actually the case in the TPRT exchanges should alert us to the deepening of our responsibilities toward the poor—at the least, not to institutionalize situations that operate primarily to the advantage of the more powerful or wealthier party to the exchange.

That we are moral strangers is not a given, it is a decision. It is the point of TPRT that this moral gesture involves the donor and the recipient more deeply in a community. The act is one that carries its own gravitas. In this way, all TPRT remains a serious event, and it is irreducible to another sort of exchange. This very irreducibility is important, and, for many faith communities, this renders it impermissible for this very reason.

Acknowledgments We thank Nissim Benvenisty, Hebrew University. We also thank the undergraduate students in the winter 2008 and fall 2008 quarters of the Religion and Bioethics class of Northwestern University and Victor O'Halloran, a summer intern for the Oncofertility Consortium, for their assistance in researching and preparing material for this chapter.

References

1. Congregation for the doctrine of the faith. Instruction dignitas personae on certain bioethical questions. Sept 8, 2008; http://www.vatican.va/roman_curia/congregations/cfaith/documents/rc_con_cfaith_doc_20081208_dignitas-personae_en.html. Accessed 31 Aug 2009.
2. Verhey A. Focus: Evangelical voices. Introduction. J Relig Ethics. 1989;17(2):77–9.
3. Institute for the Study of American Evangelicals. Defining the term in contemporary times. http://isae.wheaton.edu/defining-evangelicalism/defining-the-term-in-contemporary-times/. Accessed 30 Aug 2009.
4. National Association of Evangelicals. http://www.nae.net/index.cfm. Accessed 30 Aug 2009.
5. General Council of the Assemblies of God. Infertility. http://www.ag.org/top/beliefs/relations_16_infertility.cfm. Accessed 28 Aug 2009.
6. Powell CMH. Respecting ethical boundaries in reproductive medicine. Enrichment J. 2008 (Summer). http://enrichmentjournal.ag.org/200803/200803_140_EthicsMedicine.cfm. Accessed 28 Aug 2009.
7. Price J. Embryo adoption. 9 Jan 2006; http://www.sbc.net/redirect.asp?url=http://www.erlc.com/article/embryo-adoption/&key=in+vitro&title=Embryo+Adoption&ndx=SBC,+IMB,+NAMB,+ANNUITY,+LIFEWAY,+WMU,+ERLC,+SEMINARIES. Accessed 29 Aug 2009.
8. Allen B. Southern baptist leader says in-vitro fertilization immoral. Ethicsdaily.com, 16 Jan 2008.
9. Connolly J. Top U.S. Evangelical leader: all involved with IVF responsible for "vast human tragedy." http://www.LifeSiteNews.com, 11 Jan 2008.
10. Sachedina A. Islamic perspectives on research with human embryonic stem cells. In: Ethical issues in human stem cell research: religious perspectives. Rockville, MD: The National Bioethics Advisory Commission; June 2000:G-1–G-6.
11. Gatrad AR, Sheikh A. Medical ethics and Islam: principles as practice. Arch Dis Child. 2001;84(1):72–5.
12. Inhorn MC. Making Muslim babies: IVF and gamete donation in Sunni versus Shi'a Islam. Cult Med Psychiatry. 2006;30(4):427–50.
13. Ebrahim AFM. Biomedical issues: Islamic perspective. Kuala Lumpur: A.S. Noordeen; 1993.
14. Mackler AL. Is there a unique Jewish bioethics of human reproduction? Annu Soc Christ Ethics. 2001;21:319–23.
15. Dorff E. A Jewish approach to assisted reproductive technologies. Whittier Law Rev. 1999;21(2):391–400.
16. Biale R. Women and Jewish law: the essential texts, their history, and their relevance for today. New York: Schocken Books Inc.; 1995.
17. Dorff EN. Is there a unique Jewish ethics? The role of law in Jewish bioethics. Annu Soc Christ Ethics. 2001;21:305–17.
18. Schenker JG. Infertility evaluation and treatment according to Jewish law. Eur J Obstet Gynecol Reprod Biol. 1997;71:113–21.
19. Bhattacharyya S. Magical progeny, modern technology: a hindu bioethics of assisted reproductive technology. Albany: State University of New York Press; 2006.
20. Widge A. Sociocultural attitudes towards infertility and assisted reproduction in India. Curr Pract Controversies Assist Reprod. 2002. https://www.who.int/reproductive-health/infertility/11.pdf. Accessed 30 Aug 2009.
21. Harvey P. An introduction to Buddhist ethics: foundations, values and issues. Cambridge: Cambridge University Press; 2000.
22. Keown D. Buddhism and bioethics. New York: St. Martin's Press; 1995.
23. Numrich PD. The problem with sex according to Buddhism. Dialog. J Theol. 2009;48(1):62–73.
24. Taniguchi S. Biomedical ethics from a Buddhist perspective. Pacific World New Series. 1987;3(Fall):75–83.

Part VII

Navigating Third-Party Reproduction

Choosing Egg Donors and Gestational Carriers: Avoiding the Pitfalls

20

Mindy Berkson

Introduction

Prominently splashed across media are famous artists, actresses, and high-profile professionals using gestational carriers and egg donors to create their families. While these headlines make infertility seem "fashionable," they often mask the real anguish associated with the process of exploring fertility treatments using egg donors and gestational carriers. The emotional trauma of not being able to conceive, along with the physical demands of injectable hormones, the potential negative side effects, and the expenses associated with medications, treatments, and the cost for egg donors and gestational carriers, all pose significant stressors. While these are all common issues, they do not eliminate the desire to build one's own family. The key is finding that hopeful starting point to begin the journey.

Planning, preparing, gathering information, and educating oneself on egg donation and use of gestational carriers are essential to maximizing a patient's chances of success and minimizing their financial exposure over time. Infertility consultants can help patients build the foundation for egg donation and use of gestational carriers by identifying resources that are flexible and adaptable to stumbling blocks they may encounter on the journey. It is also essential to pull together a solid team of **unbiased** professionals. Helping clients become their **own best advocates** is instrumental in helping them make informed decisions throughout the family-building journey.

When trying to find an egg donor or gestational carrier, many patients try to work with someone they know. On the surface, using a known egg donor or gestational carrier sounds like the best plan from a trust perspective, and the arrangement can be less expensive than using an anonymous donor or an unknown gestational carrier. However, as with every decision in the assisted reproductive arena, there are pros and cons of using known or unknown egg donors and gestational carriers.

The best of intentions may be involved in a patient's decision to use a known egg donor. For example, it may be a priority for their offspring to know their biological roots and to someday meet and perhaps have a future relationship with this person. However, using a person they know and trust can sometimes be a double-edged sword; there are times when using a known donor can also have negative consequences.

But for many, these situations work. If one uses a known donor, both parties should be prepared for success by talking through various situations and asking some tough, but important, questions, such as what will this relationship look like when we celebrate holidays together? Is the known donor comfortable giving up all parental rights and responsibilities? Are all parties willing to participate in a psychological evaluation to formally address any concerns and discuss potential

M. Berkson (✉)
Lotus Blossom Consulting, 35 East Wacker Drive, 9th Floor, Chicago, IL 60601, USA
e-mail: mindy@LotusBlossomConsulting.com

J.M. Goldfarb (ed.), *Third-Party Reproduction: A Comprehensive Guide*,
DOI 10.1007/978-1-4614-7169-1_20,

physical risks associated with anesthesia and medical treatment?

For others, anonymous egg donors are a more appropriate choice. Seeking the ideal criteria in a perfect stranger is often a very intimate process. Sometimes it is difficult to place great trust and confidence in a perfect stranger. Thus, there is always some level of risk in the decision-making process.

Similarly, there are many pros and cons to using a known versus unknown gestational carrier. Because the gestational carrier will be carrying the couples' child, the couple must be completely comfortable that the gestational carrier will take proper care of herself during the pregnancy, including not smoking and not drinking alcohol. Understandably, many couples are more reassured with a gestational carrier they know. On the other hand, many couples cannot find an appropriate gestational carrier they know. Additionally, the use of a known gestational carrier brings up issues similar to those discussed above regarding using a known egg donor.

The agency that recruits egg donors and gestational carriers is the gatekeeper to the donor or gestational carrier, and their agenda is to be the advocate for their recruited candidates. Patients should be cautioned to know their risks before committing to any one agency. Sperm from a sperm bank is always frozen, and, therefore, the goods are on hand. Couples can feel confident that the sperm bank can deliver. But with egg donor and gestational carrier situations, one must assume a different level of risk. Before patients commit, they need to understand the potential pitfalls of working with any one agency.

Three Pitfalls of Working with Recruiting Agencies

1. Understand that recruiting candidates is expensive and time-consuming. Also know that qualified candidates are difficult to find. Many agencies require funds up front to share profiles with clients to help offset these costs. Patients should be cautioned to be careful about limiting themselves to just one agency by putting funds on the table before they have a suitable candidate. The agency may not be able to meet patients' ideal criteria in a reasonable timeframe.
2. Since recruiting qualified candidates is difficult, many agencies list match. This means that they keep a waiting list of clients, and once a gestational carrier candidate is recruited, a match is made. It is crucial that the available candidate is an ideal candidate for the patient's particular situation and that all parties have like-minded attitudes towards the pregnancy.
3. Agency contracts can be restrictive and onerous. Patients must be certain that the agreement they are entering into is in their best interest. An example of an onerous clause is "if the donor does not pass medical or psychological clearance, we (the agency) will find a replacement candidate." But what if a suitable "replacement" candidate is not readily available in a reasonable timeframe? In this case, it would be preferable for the patient to receive a full refund.

Identifying Egg Donors

It is helpful to avoid the pitfalls mentioned in the previous section by not working with only one agency. Using an infertility consultant may help patients overcome these pitfalls because infertility consultants may have networks of agencies to greatly expand the pool of available candidates, enabling one to identify a suitable match more quickly. Furthermore, an effective infertility consultant should be able to help mitigate financial risk through pre-negotiated arrangements with agencies that offer special perks to patients who work with the infertility consultant.

Identifying Gestational Carriers

Infertility consultants can work with clients to secure an ideal candidate and become their advocate. In this capacity, the consultant makes certain that he/she has a thorough understanding of the patients' unique situation and exactly what they

are seeking in a gestational carrier. For example, when looking for a gestational carrier, the consultant will discuss many issues, including, but not limited to, the following:

- Indicators for invasive testing procedures such as amniocentesis and Chorionic villus sampling (tests that determine chromosomal abnormalities).
- What to do with results of invasive testing?
- Would they want to terminate a chromosomally abnormal pregnancy?
- How many embryos are they considering for transfer?
- How they feel about selective reduction, especially if clients are planning to transfer multiple embryos?
- What it means to have a multiple pregnancy?
- What are the risks associated with a multiple pregnancy?

If a gestational carrier candidate is not willing to comply with a patient's desires regarding the above issues, then clearly this is not a like-minded match.

The answers to these difficult and thought-provoking questions are exactly what lead the consultant on a search for the ideal gestational carrier arrangement for all involved parties. This is not only the groundwork to finding a like-minded candidate, but it is also the very essence of the legal contract that will eventually be drafted between the client and the gestational carrier. Certainly a legal contract will never get to signature if all parties are not in agreement.

For the patient, there is still more to consider when looking for an appropriate candidate.

Insurance

- Does the gestational carrier candidate have insurance to cover maternity and delivery?
- If not, can a policy be secured?
- Does she live in a "gestational carrier-friendly" state where intended parent(s) can get their names on the birth certificate at birth or shortly thereafter?
- Does the gestational carrier have access to good obstetric care, and how far is she from a hospital with a top-rated neonatal intensive care unit?

Patients must be their own best advocates, which requires investigating the details that can either save money or cost them dearly in the long run.

Most health insurance policies have exclusions for gestational carriers. Therefore, it is essential to analyze policy alternatives that can help save thousands of dollars in medical expenditures. Some states offer maternity policies; other states offer nothing. Disability policies can often be purchased to offset financial risk. Complications-only policies are also an option. But it is the gap analysis performed by a licensed insurance agent that can help patients best analyze what the options are for their given situation and how these options impact their individual risk adversity given their individual financial situation.

Gestational Carrier Laws Vary from State to State

Gestational carrier friendliness varies across the country. Gestational carrier-friendly means that parentage can be achieved at some future point before or after birth. But from state to state, this law varies greatly. Some states require pre-birth orders to get intended parents' names on the birth certificate after the birth, and other states require a formal adoption after the gestational carrier delivers. Other states are more favorable in getting intended parents' names on the birth certificate at birth, as long as one parent is biologically related to the child. Often, how the embryos are created is relevant to the big picture. Thus, the individualized situation can and does impact the selection of a gestational carrier candidate from state to state.

Identifying an attorney familiar with this genre of law is essential. The attorney to establish parentage should only represent a patient if he/she is licensed in the state the gestational carrier will deliver. But it is also important for the patient to recognize the importance of achieving unbiased legal opinions. The following real-life example illustrates this point.

A patient from Ireland contacted me seeking a gestational carrier candidate in California. After learning the particulars of their situation (heterosexual married couple, using an egg donor and intended father sperm, budget constraints, etc.), they were asked why they were solely focused on a California candidate. They said they spoke with an attorney in California, and he said that California was a good state for gestational carriers.

They were asked, "Did he also tell you that there are many other legally friendly states with which to accomplish a surrogacy arrangement?"

"Well, no."

They then were asked, "Did the attorney tell you that exploring a gestational carrier arrangement in California will exceed your allotted budget because gestational carrier arrangements in the Western region of the country tend to be higher than in other area regions of the country?"

"Well, no."

"Did the attorney tell you that he is only licensed to practice in California and therefore unless you have a California gestational carrier he cannot represent you?"

"Well, no."

This example illustrates the importance of patients being their own best advocates and working with **unbiased** professionals to gather information and resources to help make critical decisions that take into account all the factors that play into a gestational carrier arrangement.

Estate Planning

Engaging appropriate financial and estate-planning advice is essential for patients prior to embryo transfer. An estate plan that names guardians and intentions protects the patient, the partner, the gestational carrier, and the unborn offspring. An effective estate plan must also address the disposition of frozen embryos. These priceless assets are all too often overlooked.

Financial Planning

Establishing a budget that includes reserves for more than just one treatment cycle is prudent. Identifying a gestational carrier who is willing to undergo more than one embryo transfer limits hard costs and excessive expenditures up front.

Prudent financial planning through identification of insurance opportunities and setting budget parameters for exploring treatment help reduce financial risk. Using estate-planning tools and techniques helps to protect all involved parties by having an estate plan securely in place prior to embryo transfer.

Conclusion

Using egg donors and gestational carriers can be a positive and hopeful experience. Similar to building a house, a solid foundation, including all the ancillary pieces that encompass an egg donor or gestational carrier arrangement, is essential. Building the foundation for collaborative reproduction involves more than just identifying an egg donor or a gestational carrier and a clinic. It truly takes a multidisciplinary team of **unbiased** professionals, possibly including infertility consultants, to maximize a patient's chances of success and minimize their financial expenditure over time. Patients who become their **own best advocates** make more informed medical decisions.

Index

J.M. Goldfarb (ed.), *Third-Party Reproduction: A Comprehensive Guide*,
DOI 10.1007/978-1-4614-7169-1, © Springer Science+Business Media New York 2014