Pediatric Radiology (2020) 50:1801–1809
https://doi.org/10.1007/s00247-020-04702-4

FETAL IMAGING

The key role of the pediatric radiologist in developing a multidisciplinary fetal center

Lindsay D. Pesacreta[1] · Kate E. Cilli[1] · Anne K. Lawrence[1] · Dorothy I. Bulas[1,2]

Received: 20 November 2019 / Revised: 10 April 2020 / Accepted: 5 May 2020 / Published online: 19 November 2020

Abstract
With the demand for fetal imaging and fetal care programs on the rise, the authors of this manuscript review the components of building a successful fetal imaging center. Creating an environment that engages a multidisciplinary team, utilizing a central coordinator to review clinical and psychosocial aspects of each patient, and ensuring ongoing research and quality control are essential components to the success of growing a program.

Keywords Fetal medicine · Fetal program · Fetus · Magnetic resonance imaging · Multidisciplinary · Prenatal counseling · Ultrasonography

Introduction

As perinatal assessment and fetal imaging advance, multiple subspecialists have become important contributors to the care of the fetus and the mother. Providing appropriate expertise and coordinating care has become complex, requiring an innovative infrastructure to handle the organization of a multidisciplinary center. Some centers interested in growing a fetal center already have access to both pediatric and obstetric expertise, including delivery services. In this scenario, coordination of services with additional counseling and subspecialty support needs to be developed. Standalone pediatric hospitals, which typically lack delivery services and obstetric support, require partnerships with the fetal center team, in particular the pediatric radiologist, the referring maternal–fetal medicine providers, obstetricians and delivery centers. In this manuscript we review the distinct requirements for building successful fetal imaging centers, with an emphasis on the importance of having a strong multidisciplinary infrastructure to support the role of the pediatric radiologist.

✉ Lindsay D. Pesacreta
lpesacre@childrensnational.org

[1] Fetal Medicine Institute,
Children's National Hospital,
111 Michigan Ave. NW, Suite M3118,
Washington, DC 20010, USA

[2] Division of Diagnostic Imaging and Radiology,
Children's National Hospital,
George Washington School of Medicine,
Washington, DC, USA

Who: well-trained imaging specialists and clinicians

To build a successful fetal program, it is essential to develop a strong interdisciplinary team that is well-trained, enthusiastic and supportive of the mission of the program [1, 2]. With no Accreditation Council for Graduate Medical Education (ACGME)-accredited programs in fetal imaging, it is important to identify pediatric radiologists and pediatric neuroradiologists who are willing to spend time developing the needed expertise in fetal pathophysiology and normal fetal development. Numerous books, articles, websites, national workshops and meetings dedicated to fetal imaging are available to those interested in growing their knowledge. The Society for Pediatric Radiology has a comprehensive website with templates, protocols and cases, with an active list-serve of fetal imagers who share interesting and confusing cases. When a center is first developing, it is best to have one or two radiologists identified as the point-person to help coordinate scheduling, train sonographers and magnetic resonance (MR) technologists, and develop relationships with referring maternal–fetal specialists and obstetricians.

The decision to offer obstetric US interpretations by a pediatric radiologist is center-specific. The advantage of

correlating prenatal US findings with fetal MR findings on the same day by the same radiologist is to provide a complete assessment of the fetus, which is particularly important when timely and accurate counseling is needed. Combining these exams with a fetal echocardiogram is also powerful, particularly when assessing a case with multiple anomalies. The ability to review the sonogram at the same time as the fetal MRI improves the sensitivity and specificity of each exam.

It can be difficult for a pediatric radiology department to develop expertise in US interpretations. One needs superb sonographers familiar with obstetric protocols as well as fetal pathophysiology. Most pediatric sonographers do not scan obstetric patients routinely and the training required might be beyond a free-standing pediatric radiology department's bandwidth. Obstetricians and maternal–fetal specialists, who are now well-trained to perform and interpret obstetric sonograms, might not understand the benefit of referring a patient for an additional US exam when MRI assessment is the request and reason for referral. Insurance companies might refuse to pay for an additional sonogram when one has recently been performed by the referring maternal–fetal medicine providers. Coordinating US, MRI and multiple consults on the same day requires flexibility on the part of the entire team consulting with the patient on the day of service, as well as scheduling flexibility to ensure emergent patients are seen quickly. Blocking times on the schedule might not be an efficient use of US and MR slots.

Developing expertise in scanning and interpreting fetal MR also takes time and patience. Fetal MR protocols must be developed for the various indications and there might be a steep learning curve in obtaining appropriate images when dealing with a moving fetus and anxious mother. Initially having the radiologist sitting with the MR technologist in real time is best to learn the appropriate planes and sequences. This can be difficult for the radiologist, who is likely covering other services. Scheduling studies when both an experienced technologist and radiologist are available can be problematic.

An additional issue to be discussed is who should interpret a fetal exam (body imager versus neuroradiologist). This is dependent on each center. Some centers have a single fetal imager interpret the entire study. Some centers have neuroradiologists interpret fetal cases with central nervous system (CNS) anomalies while body imagers interpret the other cases. At times, however, there are multiple anomalies that require the input of both specialists. At our center we have both a body imager interpret the prenatal US and fetal MR imaging with a review and formal interpretation (without extra charge) by a neuroradiologist. This routine review has been particularly useful when an unexpected CNS anomaly has been discovered that significantly changes the direction of counseling.

It takes a village to appropriately determine the impact of findings by US and MR examinations. The imager's interpretations are only as useful as the specialists supporting the perinatal care. Discussing management options with the family requires a strong multidisciplinary team including maternal–fetal specialists, geneticists, neonatologists, genetic counselors, social workers, pediatric surgeons, pediatric neurosurgeons, urologists, neurologists, orthopedic surgeons and plastic surgeons.

Coordinating the expertise needed for each patient in context with her unique situation and background is best done by one central clinician. Literature has suggested benefits of the fetal center coordinators model to include appropriate triage of each referral as well as appropriate specialist selection for the prenatal visit [1]. Prenatal genetic counselors, nurse practitioners, and social workers can act as clinical coordinators. These master-trained clinicians are helpful in ensuring the team has appropriate background regarding the patient's obstetrical history, previous counseling by outside providers, as well as the patient's major concerns. Prenatal genetic counselors are master's degree board-certified professionals with advanced training in medical genetics and counseling who help couples understand the complexities of genetic screening/testing and guide them in making informed choices about their pregnancies. As part of the fetal care team, the genetic counselor reviews family and medical history, interprets available genetic testing results, counsels couples about the option for further genetic testing, and assesses the need for additional resources [3]. Coordinators assess a patient's emotional state and gather insight on a patient's educational, cultural and spiritual background. They also educate the team on all available options a patient might be considering ranging from fetal interventions to termination of pregnancy.

The inclusion of multiple specialists is a key component to appropriately counsel the mother and supportive family members, and helps to mitigate the level of maternal anxiety surrounding the prenatal diagnosis [1, 4]. The American College of Obstetricians and Gynecologists (ACOG) and American Academy of Pediatrics (AAP) guideline supports the importance of multidisciplinary counseling in fetal care centers [5]. The world of fetal medicine is an expanding and constantly developing area of medicine that lacks explicit guidelines and long-term outcome data. Much counseling is based on a clinician's expertise and experience. Creating opportunities for growth and experience for both established and junior subspecialists is important to develop quality counseling for the family. Incorporating prenatal counseling into various pediatric specialty fellowship programs should become more routine. A recent survey of pediatric surgery fellowship graduates revealed that almost half felt unprepared for prenatal counseling [6]. Early structured exposure to the art of counseling patients about fetal anomalies is important for developing enthusiasm for future participation in fetal programs.

Providers should understand the powerful influence their words carry with prenatal patients. Taking the time to investigate where the patient is emotionally, spiritually and

cognitively is crucial to successful counseling. Implementing pre-consult patient questionnaires to glean insight to these topics can be helpful. Asking for the patient's understanding of the situation and inquiring about her questions prior to counseling can help guide discussions. Tailoring of counseling based on these factors fosters a foundation for successful counseling and mutual respect. By staying current with latest evidence-based research and having multidisciplinary discussions prior to counseling, clinicians can best present accurate and consistent information and realistic expectations, and mitigate unnecessary anxiety.

Open communication among providers prior to and during the meeting with families is important for creating clinical consensus among the pediatric team. This is especially important because clinical perspectives of prognosis can differ among specialties [7, 8]. Before counseling the family, striving to have all participating specialists review imaging and lab results and have an honest conversation about implications with the various subspecialists helps to achieve a unified, intentional and informed team. It is also important for the ethical considerations of the case to be honestly and openly discussed among the clinical team [9].

Understanding the spectrum of possible outcomes is necessary to achieve this goal and requires not only review of US and MR images but also familiarization of family history, genetic testing and laboratory results. Incorporating expertise from various specialists and creating an opportunity for discussion among the clinical team in an environment of respect for differing views among specialists is crucial. This requires input from specialists who can speak to the surgical risk, the long-term prognosis, the possible causes, the quality of life, and the various outcome decisions.

Examples of useful questions to discuss among the multidisciplinary team to guide counseling include:

- Is this isolated or more likely related to a genetic condition/syndrome?
- Can we identify a cause for the findings?
- What will the quality of life be for this child?
- Is there an intervention available prenatally?
- Will there be immediate concerns to anticipate at delivery?
- Can the abnormalities be corrected after birth?
- Is palliative care an option?
- What are the long-term and lifelong expectations for the child and the family?

How: developing and sustaining a referral base

For a fetal imaging center to succeed it is important to keep the referring obstetric and maternal–fetal medicine clinicians informed throughout the pregnancy and delivery and work in conjunction with these providers. Assessment of appropriate delivery planning and location of delivery needs to be balanced between optimal management of the fetus versus referral and family preferences.

Coordinating a smooth transition into the pediatric hospital setting for those babies born at local hospitals is important. Ongoing outreach to referral locations is helpful in developing strong partnerships and ensuring appropriate referrals. Local grand round lectures, monthly web continuing medical education (CME) lecture series, and newsletters (Fig. 1) highlighting interesting cases and specific staff members are all useful tools for the referring community to familiarize themselves with the fetal team. Having a clinical team member speak to the referring provider directly about the findings and counseling immediately after the visit helps solidify relationships that are important for appropriate follow-up and delivery planning.

Centralized referrals to a single fax and main clinic line can help decrease confusion as to which subspecialists and imaging studies should be scheduled. This model has many benefits including simplifying the patient's experience to a single visit as well as appropriate clinical triage of urgency of referrals [1]. This helps ensure referrals are not lost and streamlines the entire process from the referrer's perspective. A common referral sheet (Fig. 2) provided to referring practices can further streamline the process. This allows the referrer to easily input basic information the fetal staff needs to appropriately schedule patients. Each new referral can be processed by coordinators, who determine whether a US, MR or echocardiogram, or a combination, is needed and which specialists — surgeon, urologist, neonatologist, etc. — should be included. Understanding what specialists might be the most informative for the patient is important to ensure an appropriate counseling team. The coordinator can review all relevant clinical information including lab results and previous imaging reports so any additional specialists who are not selected by the referrer can be added. Once a new referral chart has been reviewed, the coordinator calls the patient to explain what will be included in the comprehensive visit, obtains further medical history, and acts as a supportive representative for the institution. This phone call is the first encounter the mother might have with the center and is important in the development of an ongoing empathetic relationship between the pregnant woman and the center. By establishing this connection, the coordinator not only provides a compassionate presence to decrease anxiety surrounding the unknown, but also gathers crucial information to shape the future counseling.

How: counseling

Fetal anomalies can cause psychological stress on the pregnant woman and her partner [10]. The manner in which the

Volume 5 / Issue 1
Winter 2018

Children's National
Fetal Medicine Institute
Part of the Children's National Health System

Fetal Connections

Dear Colleagues,

We hope the beginning of 2018 has been good to you, and that you have been able to stay warm!

In this next edition of Fetal Connections, we are highlighting our Fetal Orthopaedic Program. This program highlights our mission of providing prenatal pediatrics and continuity of specialty care to your patients. If you have any questions about this specialty program, please reach out us via email at: fetalmedicine@childrensnational.org.

Our case study for this issue focuses on a congenital clubfoot case, including diagnosis, delivery, and post-natal care.

We would also like to remind you of our monthly CME Topics in Fetal Medicine series, and remind you of our new 12:30pm time slots, incorporated following your feedback about later time options for this series. As always, we would love to hear any feedback or recommendations for future topics!

Best wishes,

Adré J. du Plessis, MBChB, MPH
Director, Fetal Medicine Institute
Director, Fetal Brain Program
Division Chief, Fetal and Transitional Medicine

Our Fetal Orthopaedic Program

Our orthopaedic-fetal consult team is made up of a group of clinical orthopaedists who treat a wide range of orthopedic conditions. We arrange consults based on fetal sonogram findings to match up with the clinical interests and skills of the clinician, as this allows the most robust consult session, allowing families to ask a wide range of questions about conditions diagnosed, treatment options, and post-natal patient function.

Key Points about our Fetal Orthopaedic Program:

- Our fetal imaging team has broad experience in fetal musculoskeletal diagnoses based on advanced fetal ultrasound and MRI techniques
- We consult and review in detail imaging studies with our fetal imaging team before counseling the pregnant family
- We work closely with care coordinators that help to coordinate the management plan during the pregnancy and after the baby is born
- By becoming involved with families prior to delivery we are able to engage them, answer their questions and support them during this stressful time, and reassure them that the best possible plan will be developed for their baby after birth. In so doing families are better able to approach the delivery with the confidence that a plan is in place for their baby

Fig. 1 Example of our quarterly newsletter, *Fetal Connections*

111 Michigan Ave NW
M3-119
Washington, D.C. 20010-2970
Ph: 866-476-7409 | 202-476-7409
Fax: 202- 476-5897

Request for Fetal Medicine Institute Services

Patient Information	
Patient Name (Last, First MI):	
Patient Address:	Patient Date of Birth:
Patient E-mail Address:	Patient Telephone:
Requesting Provider	
Name (Last, First MI):	
Institution/Group Name:	
Address:	
Telephone:	Fax:
Referral Information	
Diagnosis:	EDC:

Requested Physician Consults:		Requested Imaging Services:	Requested Professional Services:
☐ Cardiology	☐ Neurology	☐ Fetal MRI and Ultrasound	☐ Genetic Counseling
☐ Craniofacial Surgery	☐ Neurosurgery	☐ Fetal Ultrasound Only	☐ Other: _____
☐ Genetics	☐ Orthopedics	☐ Fetal Echocardiogram	
☐ Infectious Disease	☐ Surgery		
☐ Neonatology	☐ Urology		

Requesting Provider Signature	Date

Checklist of Required Documents:

☐ Demographics Page/Facesheet	☐ Prenatal Labs
☐ Copy of Insurance Card and Photo ID	☐ Ultrasound Report
☐ Genetic Testing Results	☐ Relevant Clinical Notes
☐ Referral on Rx Pad (all HMO and POS plans)	☐ Other _____

Please send this form and all required documents to:
Fax: (202) 476-5897 –or– email: FetalMedicine@ChildrensNational.org

Please note that this form does not constitute an insurance referral.

Created: 05/2014
Updated: 08/2015

Fig. 2 Example of our universal request for Fetal Medicine Institute services form

specialists present information and counsel about implications is very important to minimize this stress [11]. Specialists should maintain a transparent and non-directive approach while discussing all possible treatment options. Specialists should remain unbiased while being respectful of the woman's spiritual beliefs, culture and emotional state. A survey investigating what women receiving a prenatal US abnormality value found that women prefer not only information given in a timely manner, but also privacy during counseling [12]. This study also found that women want different options explained, with time to ask questions and information about follow-up care. Women also value sympathy from the person delivering the findings [12]. All these point to the importance of having private rooms for counseling, large enough for all family members and various specialists to be present as needed. With many radiology suites lacking counseling space, it is important when designing a fetal center to have waiting rooms that can be separate from the bustle of large pediatric registration areas, and adequate-size rooms to allow a family to sit and reflect on the information being presented.

With the increasing prevalence of fetal programs in the medical community, fellowship programs should introduce, foster and include opportunities for learning appropriate prenatal counseling techniques. Berman et al. [6] gathered opinions from pediatric surgeons attempting to generate expert surgical consensus. They argued the need to include fetal medicine in pediatric surgical fellowship programs to combat graduates feeling unprepared to perform prenatal counseling. Including fellows from many disciplines such as radiology, neonatology, genetics and neurology has proved to be a successful model in our center. Providing an environment to introduce prenatal counseling in fellowship programs should create more comfort and expertise when these trainees are asked to perform counseling as an attending physician.

Berman et al. [6] also discussed how there is no clear consensus among pediatric surgeons when counseling conditions like congenital pulmonary airway malformations and congenital diaphragmatic hernias. The need to have conversations and open communication among specialists is crucial to provide the most up-to-date information, allowing the family to understand that there might be several ways to manage their care.

Prior to counseling the family, the team of pediatric specialists should have space and time to convene together with the coordinator separate from the family to review pertinent lab results, imaging results and insight to the woman's psychological, cultural and emotional state. Having the mother complete a questionnaire (Fig. 3) prior to the visit helps inform the clinical team about who she is accompanied by, her current understanding of the referral indications, and her most pressing concerns and questions. The answers, along with the choice of language, can provide clues as to what options she might be considering, such as fetal interventions or termination of pregnancy. Using "my baby" or a proper name versus "the fetus," for example, might signal someone who has made the decision to continue. The impact of this language should not affect the information presented to the woman but should inform the way in which the information is presented.

To facilitate a successful counseling session, it is important to ensure the woman understands the diagnosis. Because many families do not have a medical background, medical illustrations and models can be useful, and access to the fetal MR images advantageous. Fact sheets for the most common diagnoses can be useful, with access on the web for families to review after the session has ended. This can be helpful to provide accurate medical information the woman can share with her partner and support network, as well as provide reference material for the patient after her visit.

It is important for coordinators to collect local parent resources to provide further support for these women and their families. This list can include peer references of families who have experienced a child with a similar diagnosis and have volunteered to speak to pregnant women, community resources for individual and group counseling, online resources and support groups. Patient literature in the form of bereavement books and guides for couples considering termination of pregnancy can be helpful as well. Child life specialists, when available, can be another important service to parents looking for guidance on how to speak to their other children about a fetal diagnosis.

A system assigning acuity based on level of care required at the time of delivery can help the team coordinate appropriate perinatal management options [13]. While many infants require only postnatal outpatient follow-up, some require urgent transport or actual delivery at the fetal center. Assigning appropriate level-of-care expectations at delivery helps alert the neonatal intensive care unit (NICU) for expected admissions and required support equipment (e.g., extracorporeal membrane oxygenation pump) as well as potential transportation needs.

Level of care 1 is considered minimal risk and amenable to routine obstetric and neonatal management; level of care 2 is minimal risk, although specialized neonatal care is expected, requiring coordination of delivery services and scheduled induction of labor. Level of care 3 and level of care 4 are high risk for neonatal compromise with a need for planned delivery and coordinated multispecialty postnatal care [14, 15]. Assigning every case a delivery level at the time of the consult also encourages the specialists to have a thoughtful discussion about what the expected postnatal course of action is with other specialists as well as the family.

How: delivery planning

Coordinating delivery planning can be complex. If a delivery warrants special support, relaying pertinent information to the delivery hospital nurseries and NICUs is crucial. The

111 Michigan Ave NW
M3-119
Washington, DC 20010-2970
Phone: 866-476-7409 | 202-476-7409
Fax: 202-476-5897

New Patient Questionnaire

Please complete this short questionnaire. The information you share will help us to provide the best care for you and your family.

Patient's Name:_____ Partner's Name:_____

Who is accompanying you to your visit today?

Name:_____ Relationship:_____

Name:_____ Relationship:_____

Name:_____ Relationship:_____

Marital Status *(circle one)*: Single Married Divorced Other:_____

Your Occupation:_____

Your Partner's Occupation:_____

In your understanding, why are you being referred to the Fetal Medicine Institute?

Do you have any family or pregnancy history that concerns you?

What questions and concerns do you have today?

Is there any other information that we should know to best care for you?

Created: 12/2014

Fig. 3 Example of our new-patient questionnaire

neonatologist is a crucial member of the fetal team needed for coordination of complex deliveries and the high level of care required after birth [1]. Neonatologists on the fetal center team are experienced with the capability and comfort levels of the area's delivery hospital neonatology services and can help determine appropriate location for a delivery. They provide insight into the level of care at the delivering institutions and whether the fetal center recommendations can be successfully achieved there. If not, the delivery might need to occur in a partner delivery room close to the pediatric hospital or, when severe (e.g., neck mass with compromised airway), actually in the fetal center. For families where the infant is expected to be transferred, a neonatologist from the center should meet with the mother and her family to discuss what to expect from delivery and transfer as well as the stay beyond. A tour of the NICU with a dedicated NICU social worker who can address additional questions should also be offered. The neonatologist should reach out to the delivery institution and speak to the neonatology team to ensure understanding and comfort of the plan and make needed adjustments. For cases requiring outpatient follow-up or any particular recommendations to be started in the nursery (e.g., lab work, medications) the coordinator involved with the case sends a delivery packet to the planned nursery prior to the due date. This includes all imaging and specialist reports as well as a document containing the diagnosis, recommendations and names and contact information for all providers involved with the mother's care from her obstetrician to the pediatric team of specialists. There are further instructions about how to make the postnatal appointments after the infant is delivered. This packet is also sent to the mother's obstetrician, perinatologist, patient and the planned pediatrician.

Newborns who require outpatient follow-up can be challenging to track, particularly when names of the infant and mother are different. The mother's prenatal visit chart and the newborn infant's medical record are typically not automatically linked. A postnatal nurse coordinator can be responsible for calling patients at the time of their due date to ensure they have made the required follow-up appointments and, if not, can assist the parents in making these appointments.

The ultimate goal of a fetal center is to provide prenatal diagnosis; appropriate prenatal, transitional and neonatal care planning; and familial support for the entirety of the child's medical care needs. Helping ensure appropriate newborn appointments are made is an important role as well. Helping transition to hospital-based programs to support the parents is also important. Utilizing a program like parent navigators, who are parents of a child with special needs who volunteer to guide newer parents, is extremely useful in helping new families navigate the system in the hospital and the community. The fetal center can also help refer families to complex pediatric care clinics, which can act as the medical home for complex patients or assist the community pediatrician in assuming primary care for the complex children.

How: quality and research

Developing a robust database allows capturing of necessary obstetric and family history, testing results, as well as documentation of recommended prenatal and delivery follow-up. Referral patterns, common diagnoses and distribution of cases among institutional specialists can be tracked. Data can be queried to generate patient lists of prenatal and postnatal diagnoses to use for research projects important in growing the field of fetal medicine [5]. Staying up-to-date with the research is important for providing evidence-based recommendations and procedures to deliver the best practice. Weekly interdisciplinary meetings with imaging results are useful for reviewing case recommendations as a team and assessing follow-up outcomes. These weekly interdisciplinary meetings allow time to discuss the previous week's cases and debate any interpretation or recommendation discrepancies. Steering committee meetings are useful to ensure goals of the program are reached, to brainstorm ideas for future growth, to address issues of care, and to provide a forum for updates about interdepartmental happenings. Morbidity and mortality conferences can be useful to review issues that need optimization of protocol development.

Conclusion

The rapid growth of advanced perinatal care and fetal imaging has expanded the need for fetal centers, not just regionally but locally. This has put a strain on hospitals, which might not have the infrastructure or expertise to provide coordinated care to multiple subspecialists. Pediatric radiologists are an integral part of the success of building a program. However, it takes an entire village of subspecialists dedicated to fetal care, support staff that can coordinate multiple imaging modalities and organize complex clinic visits quickly, space for scheduling, sensitive and comprehensive counseling involving various subspecialists expertise, and innovative partnerships with delivery teams and community physicians. With all these in place, families can get the care they need during this vulnerable time when the health of their fetus might be at risk.

Compliance with ethical standards

Conflicts of interest None

References

1. Alexis SD, Chock VY, Hintz SR (2014) Fetal centers and the role of the neonatologist in complex fetal care. Am J Perinatol 31:549–556
2. The International Society of Ultrasound in Obstetrics & Gynecology (2017) ISUOG practice guidelines: performance of fetal magnetic resonance imaging. Ultrasound Obstet Gynecol 49: 671–680
3. Menzel MB, Lawrence AK, Rubio EI, Bulas DI (2018) Team counseling in prenatal evaluation: the partnership of the radiologist and genetic counselor. Pediatr Radiol 48:457–460
4. Sewell EK, Keene S (2018) Perinatal care of infants with congenital birth defects. Clin Perinatol 45:213–230
5. American College of Obstetricians and Gynecologists, Committee on Ethics; American Academy of Pediatrics, Committee on Bioethics (2011) Maternal–fetal intervention and fetal care centers. Pediatrics 128:e473–e478
6. Berman L, Jackson J, Miller K et al (2018) Expert surgical consensus for prenatal counseling using the Delphi method. J Pediatr Surg 53:1592–1599
7. Carnevale A, Lisker R, Villa AR et al (1997) Counselling following diagnosis of a fetal abnormality: comparison of different clinical specialists in Mexico. Am J Med Genet 69:23–28
8. Brown SD, Donelan K, Martins Y et al (2012) Differing attitudes toward fetal care by pediatric and maternal–fetal medicine specialists. Pediatrics 130:e1534–e1540
9. Brown SD, Lyerly AD, Little MO, Lantos JD (2008) Paediatrics-based fetal care: unanswered ethical questions. Acta Paediatr 97: 1617–1619
10. Aite K, Zaccara A, Mirante N et al (2011) Antenatal diagnosis of congenital anomaly: a really traumatic experience? J Perinatol 31: 760–763
11. Lawrence AK, Menzel MB, Bulas DI (2016) Prenatal counseling tools for the pediatric radiologist as part of a multidisciplinary team. Pediatr Radiol 46:172–176
12. Alkazaleh F, Thomas M, Grebenyuk J et al (2004) What women want: women's preferences of caregiver behavior when prenatal sonography findings are abnormal. Ultrasound Obstet Gynecol 23:56–62
13. Donofrio MT, Skurow-Todd K, Berger JT et al (2015) Risk-stratified postnatal care of newborns with congenital heart disease determined by fetal echocardiography. J Am Soc Echocardiogr 28: 1339–1349
14. Donofrio MT (2018) Predicting the future: delivery room planning of congenital heart disease diagnosed by fetal echocardiography. Am J Perinatol 35:549–552
15. Sanapo L, Pruetz JD, Slodki M et al (2017) Fetal echocardiography for planning perinatal and delivery room care of neonates with congenital heart disease. Echocardiography 34:1804–1821