

Chapter 1

The Intrauterine Device and Adolescents: History and Present



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Abbreviations

AAP	American Academy of Pediatrics
ACOG	American College of Obstetrics and Gynecology
AYA	Adolescent and Young Adult
CDC	Centers for Disease Control and Prevention
FDA	United States Food and Drug Administration
IUD	Intrauterine Device
LARC	Long-Acting Reversible Contraception
LNG	Levonorgestrel
MEC	Medical Eligibility Criteria
PID	Pelvic Inflammatory Disease
SAHM	Society of Adolescent Health and Medicine
SES	Socioeconomic Status
STI	Sexually Transmitted Infection
WHO	World Health Organization

Learning Objectives

Following completion of this chapter, you should be able to:

1. Discuss the history of intrauterine devices (IUDs) in the USA
2. Explain the history and commonly held misconceptions about adolescent IUD use.
3. Describe the history of reproductive coercion and injustice involving the IUD in the USA

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Introduction

The modern IUD has existed in some shape or form since the beginning of the twentieth century [1]. Despite advances in this form of long-acting reversible contraception (LARC) and their demonstrated safety and efficacy for use in adolescents [2], there remain misconceptions among patients and providers regarding IUD safety and indications for use [3]. As adolescent and young adults (AYAs) are at especially high risk of unintended pregnancy, it is imperative that they are aware of all available forms of contraception, including IUDs, in order to make informed decisions that best fit their individual reproductive goals [4]. Approaches that support each patient and help them to choose a method that best meets their current and anticipated needs will be discussed in more detail in Chap. 5 [5].

Case

Callie is a 15-year-old cisgender female presenting for contraception options counseling with her mother. She was previously started on oral contraceptive pills for dysmenorrhea. However, despite many efforts to remember, she often forgets her pills. Her mother complains that her cramps have been worse recently because she is not consistent with her pills, and she has been missing more school. In private, Callie tells you that she is not currently having sex, but has a boyfriend of 6 months and they are talking about having sex soon. She has heard about IUDs from a friend and thinks that she would like to get one. With her mother back in the room, Callie voices interest in the hormonal IUD to help with her cramps. Her mother raises concerns that the IUD is too “new” and has not had enough time to be “proven safe.”

IUD History

Reviewing the history of the IUD can help us to better understand some of the lingering misconceptions regarding current IUDs [1]. First-generation IUDs were made in Germany and consisted of silkworm gut, and later hard rubber or various metals [1, 6]. England and British overseas territories later adopted the “Gräfenberg Ring” a spirally coiled metal ring composed of copper, nickel, and zinc created by Ernest Gräfenberg of Berlin, in the mid-1900s [1]. Second-generation devices containing plastic components later emerged and included the Maizlin Spring, Incon Ring, and the Dalkon Shield [1]. The Dalkon Shield, produced by the A.H. Robins pharmaceutical company, was made available for use in the USA in 1971; approximately 3.6 million were sold worldwide. The Dalkon Shield IUD was a plastic, irregular oval shape device with “foot-like” projections to prevent expulsion, and was attached to a porous multifilament string. See Fig. 1.1 below.

Fig. 1.1 A number of IUDs throughout history. (Presented with permission from the Dittrick Medical History Center at Case Western Reserve University)



Concerns regarding IUD safety came to the forefront in 1968 with a published report documenting critical IUD-associated complications and death [7]. Reports of septic abortions among Dalkon shield users prompted the Centers for Disease Control and Prevention (CDC) to conduct a physician survey in 1973 regarding patients who had been hospitalized with or had died from complications related to the use of an IUD in the previous 6 months [8]. This study estimated a device-related hospitalization rate of 5 per 1000 IUD users. Five device-related fatalities were noted, with four due to severe infection. There were additional reports around that time of maternal morbidity and mortality associated with pregnancy and the Dalkon shield in situ [9]. Use of the Dalkon shield was subsequently noted to be associated with higher pregnancy rates than expected, and higher risk of complicated pregnancies including spontaneous and septic abortions [10]. Distribution of the Dalkon Shield was halted after USA Food and Drug Administration (FDA) hearings in 1974 [9]. More than 400,000 lawsuits were filed against A.H. Robins and, in 1985, the company filed for bankruptcy.

There has been considerable controversy over the last several decades about IUD use and the risk of pelvic inflammatory disease (PID), infection, and infertility, as well as the role of the Dalkon Shield's multifilament tailstring in upper genital tract infection among its users. While earlier retrospective case-control studies impli-

cated IUDs, and the Dalkon Shield in particular, with PID and tubal infertility [10, 11], researchers since have identified bias and methodologic flaws in these earlier studies [8, 12]. These included use of inappropriate comparison groups, ascertainment bias (over-diagnosing salpingitis among IUD users), and not controlling for confounding factors, such as number of sexual partners. When these biases were subsequently accounted for, the attributed increase in infection risk related to IUD use was greatly diminished [13]. However, some disagreement persists regarding the Dalkon Shield's multifilament tail strings and their possible role in ascending infection [14, 15].

With negative press about the Dalkon Shield and concerns about the safety of intrauterine contraception, use of IUDs plummeted in the USA from a peak of 9.6% of married women using contraception in 1973 [16] to a nadir of 0.8% of women 15–44 years of age using contraception in the mid-1990s [17]. Despite declines in IUD demand in the USA their use around the world remained strong, and investigators continued to actively work on IUD design. In 1969 gynecologists at the University of Santiago developed a third-generation copper-containing IUD [6]. Later, fourth- and fifth-generation IUDs – hormone-releasing devices – were developed in Finland, and led to the current levonorgestrel (LNG) IUDs [6]. These later-generation devices have not been associated with the complications of the earlier IUDs, resulting in their increased use. Worldwide use of IUDs varies across countries and regions for a variety of reasons, including geographic differences, government policies, and healthcare provider education [18]. The most recent analysis of IUD use among married or in-union women ages 15–49 from the United Nations found wide variation in IUD use, ranging from around 1% in Oceania to more than 17% in Asia. Among industrialized countries, IUD use in the USA falls behind other countries, with 5% of women married or in-union using an IUD compared to 11% across Europe [19]. Adolescents in the USA are even less likely to use IUDs compared to adult women [20].

Contemporary IUDs

IUDs have become more accepted in the USA in recent years. Between 2002 and 2012, the percentage of sexually active women aged 15–44 years using an IUD increased more than five-fold to 9.5% [21]. A solid body of evidence demonstrates that current FDA-approved IUDs (copper IUD and LNG IUDs) are very safe to use, including in AYAs [22]. Complications from IUDs are uncommon, and include expulsion, perforation, and infection [22]. Importantly, there is not an increased risk of PID or sexually transmitted infections (STIs) in adolescent IUD users compared to the general population [23]. As of 2019, there are five IUDs available in the USA (described in more detail in Chap. 3). The CuT380A copper IUD was FDA approved in 1984. There are four hormonal IUDs, including two LNG 52 mg devices (FDA approved in 2000 and 2015), one LNG 19.5 mg device (FDA approved in 2016), and one LNG 13.5 mg device (FDA approved in 2013).

Case

You explain that IUDs are known to be safe for adolescents – even those who have never had a baby, and that using an IUD would not affect Callie’s future fertility. Her mom seems more comfortable knowing that the IUD would be safe for use in her daughter. However, she raises additional concerns. Why has she never heard of IUDs being used with adolescents before? What if Callie has it placed, but doesn’t like it? Can it be removed early? How effective is this method compared to the pills Callie was on previously?

Adolescents and Reproductive Health

In 2017, an estimated 39.5% of USA high school students reported having had sexual intercourse at least once [24]. As adolescents age, they are more likely to become sexually active; in 2017, an estimated 20.4% of ninth graders reported having had intercourse and by twelfth grade, an estimated 57.3% reported having had intercourse [24]. While rates of adolescent sexual activity and pregnancy have declined over the past decades, the USA has the highest adolescent pregnancy rate among developed countries [25–27], and most adolescent pregnancies are unintended.

Younger adolescents are less likely to use contraception with first intercourse compared to older adolescents [28]. In those who use contraception, the most common methods among USA adolescents are condoms, withdrawal, and oral contraceptive pills [28]. IUDs and contraceptive implants are the least-used method in this population, as demonstrated by the 2017 Youth Risk Behavior Surveillance Study that found that 5.3% of female high school students in the USA used a form of LARC [24]. While rates of IUD use in recent years have increased in most cohorts of women of reproductive age, this growth has not been reflected among adolescents [29].

Provider Misconceptions Around IUDs

Despite established safety and benefits, many healthcare providers continue to have concerns about IUDs [3, 30]. For example, a 2015 study assessing IUD-related knowledge and experience among family medicine residents found that half of the respondents were unwilling to place an IUD in a woman with a history of STIs within the previous 6 months and more than a third would not place an IUD if there was a history of ectopic pregnancy. Many residents would also not insert an IUD if a Pap test had not been completed in the last year, if the patient was not in a monogamous relationship, or if there was a remote history of PID [30]. These misconceptions are not evidence-based and are not consistent with current guidelines [31].

Additionally, many pediatric providers remain uncomfortable with counseling on IUDs as an option for contraception. Misinformation, suspicion regarding recommendation reversals, and scientifically unsupported beliefs about adolescent IUD use are common themes in studies of pediatricians. In a 2013 study, only 11% of pediatricians would recommend the IUD as an appropriate form of contraception for their patients [32]. Pediatrician knowledge in this study was inconsistent with contemporaneous scientific evidence, which showed no increased risk of infections or infertility with IUD use. In a later study, primary care pediatricians perceived IUDs to pose significant risks for adverse reproductive health outcomes and to be poorly tolerated by adolescents [33]. Provider misconceptions regarding safety, efficacy and indications for an IUD impede adolescents' access to a full range of contraceptive options.

Adolescent Awareness and Misconceptions Around IUDs

Studies of AYAs have found that many are unfamiliar with IUDs [34, 35]. On a college campus, less than 25% of young women surveyed had heard of IUDs and most reported little or no knowledge of this method [36]. Among AYAs who knew about IUDs, the most common reasons for disinterest in the method included the “idea of something in my body,” fear of pain with device insertion, and that a healthcare professional is required to insert and remove the device [35]. Interviews of female college students found mostly negative beliefs about IUDs as well, which were related to their fear of IUD-related infertility, hormonal side effects, and physical damage to their bodies [37]. AYAs may be influenced by friends' and family members' unfavorable opinions toward IUDs, as well as myths that IUDs are for women who have been pregnant before [37, 38], as further detailed in Chap. 5.

History of Reproductive Coercion and IUD Use

One cannot examine the history of IUDs in the USA without acknowledging how these methods have been used to control the fertility of particular communities over the past decades [39]. African American, Latinx, indigenous, and disabled persons in particular have experienced reproductive coercion around both LARC device placement and removal. In the 1990s, court judges from several states offered women the use of Norplant (a five-rod contraceptive implant) in exchange for lighter sentencing or to avoid federal prison terms [40, 41]. Similarly, during the same time period in California, additional financial public benefits were offered to women on government assistance if they agreed to have Norplant inserted. Evidence exists that healthcare providers are more likely to recommend the IUD to lower socioeconomic status (SES) Latinx and Black patients than to lower SES white patients [42]. Additionally, many young Black and Latinx women have reported feeling pressured in their experiences with contraceptive care and discussions with their providers, including IUDs, implants, and oral contraceptive pills [43]. Clinical practices

continue to exist that promote same-day LARC insertion, but require multiple visits for LARC removal. It is our duty as healthcare providers to inform all of our patients of the full range of contraceptive options available to them, while keeping in line with a reproductive justice framework that patients have the ultimate say on whether or not to use contraception and on their method of choice. Our ultimate goal is “to enhance the health, social well-being, and bodily integrity of all our contraceptive clients,” which includes honoring and respecting individuals “decisions not to use LARC, their ability to have LARC removed when they wish and their ability to have the children they want to have [44].”

Contemporary IUDs and Adolescents

In the story of IUDs, where are we now? The IUD is currently one of the most cost-effective methods of contraception in the USA [45, 46], and there has been a steady increase in use of IUDs over recent years [47]. Contemporary IUDs are safely used by adolescents and adults all over the world, without increased risk of STIs [48, 49]. In one large USA study, most adolescent IUD users were satisfied with their IUD, and only a minority opted for removal within the first year [50].

Case

Callie and her mother feel much better about an IUD as an acceptable option for Callie. Callie voices interest in the IUD because “I don’t have to do anything!” Callie’s only concern is that her cousin’s best friend’s sister-in-law posted on her social media account that there’s a high infection rate. Is this true? You explain that using the IUD does not increase her risk of STIs. Callie and her mom decide that an IUD is the best option for her, and Callie is referred to an Adolescent Medicine provider for IUD placement. You advise Callie to continue her birth control pills for now, confidentially provide her counseling on condom use, and offer her condoms to take home.

Professional medical groups strongly support healthcare providers in recommending intrauterine contraception to adolescents. In 2004, the World Health Organization (WHO) released the Medical Eligibility Criteria for Contraceptive Use (MEC), which stated that the IUD was an acceptable contraceptive choice for this age group. For nulliparous women and women less than 20 years old, the WHO MEC indicates the advantages of using intrauterine contraception generally outweigh the theoretical or proven risks [51]. In 2007 and again in 2018, the American College of Obstetricians and Gynecologists (ACOG) released Committee Opinions supporting the use of IUD in nulliparous women and adolescents [23, 52]. Similarly, in 2013, the CDC released its Selected Practice Recommendations for Contraceptive Use, stating that IUDs can “be used by women of all ages, including adolescents, and both parous and nulliparous women” [53]. This statement was reconfirmed in the CDC’s 2016 release [54]. The American Academy of Pediatrics (AAP) followed

suit when it released a policy statement in 2014 declaring that pediatricians should educate adolescent patients about LARC and that LARC methods are “first line” contraceptives for adolescents [4]. The Society for Adolescent Health and Medicine (SAHM) went further in their 2017 position paper, specifically focused on AYA access to LARCs using a reproductive justice framework, in recommending that “LARCs are offered and are available as part of essential, comprehensive contraceptive options through education, counseling, and healthcare services [55].” Their website provides links to clinical care guidelines by the WHO, ACOG, CDC, and AAP to provide clinicians easy access to reproductive health clinical care guidelines and resources [56].

Clinical Pearls

- Despite prior safety outcomes, contemporary IUDs have been well studied and proven safe for use by all people, including AYAs.
- In contrast to historical IUDs, contemporary IUDs have a well-demonstrated safety record.
- Given past incidences of reproductive coercion and other attempts to control individuals’ fertility, counseling around IUDs should incorporate the principles of reproductive justice.

References

1. Margulies L. History of intrauterine devices. *Bull NY Acad Med.* 1975;51:662–7.
2. Allen S, Barlow E. Long-acting reversible contraception: an essential guide for pediatric primary care providers. *Pediatr Clin North Am.* 2017;64:359–69.
3. Stubbs E, Schamp A. The evidence is in. Why are IUDs still out?: family physicians’ perceptions of risk and indications. *Can Fam Physician.* 2008;54:560–6.
4. Ott MA, Sucato GS. Committee on Adolescence. Contraception for adolescents. *Pediatrics.* 2014;134:e1257–81.
5. Gomez AM, Fuentes L, Allina A. Women or LARC first? Reproductive autonomy and the promotion of long-acting reversible contraceptive methods. *Perspect Sex Reprod Health.* 2014;46:171–5.
6. Thierry M. Intrauterine contraception: from silver ring to intrauterine contraceptive implant. *Eur J Obstet Gynecol Reprod Biol.* 2000;90:145–52.
7. Scott RB. Critical illnesses and deaths associated with intrauterine devices. *Obstet Gynecol.* 1968;31:322–7.
8. Sivin I. Another look at the Dalkon Shield: meta-analysis underscores its problems. *Contraception.* 1993;48:1–12.
9. Levinson CJ, Richardson DC. The Dalkon shield story. *Adv Plan Parent.* 1976;11:53–63.
10. Tietze C, Lewit S. Evaluation of intrauterine devices: ninth progress report of the cooperative statistical program. *Stud Fam Plann.* 1970;1:1.
11. Spellacy WN, Birk SA, Gordon L. Comparative randomized study of the Copper-T 200 and Dalkon Shield intrauterine devices. *Contraception.* 1975;12:453–63.
12. Grimes DA. Intrauterine device and upper-genital-tract infection. *Lancet.* 2000;356:1013–9.
13. Buchan H, Villard-Mackintosh L, Vessey M, Yeates D, McPherson K. Epidemiology of pelvic inflammatory disease in parous women with special reference to intrauterine device use. *Br J Obstet Gynaecol.* 1990;97:780–8.

14. Tennant C, Schreiber CA. Time to trim the loose ends of the tailstring debate. *Contraception*. 2011;84:108; author reply 108–9.
15. Lyus R, Lohr P, Prager S. The Dalkon Shield and pelvic infection. *Contraception*. 2011;84:108–9.
16. Mosher WD, Westoff CF. Trends in contraceptive practice: United States, 1965–76. *Vital Health Stat*. 1982;23:1–47.
17. Mosher WD, Martinez GM, Chandra A, Abma JC, Willson SJ. Use of contraception and use of family planning services in the United States: 1982–2002. *Adv Data*. 2004;(350):1–36.
18. Buhling KJ, Zite NB, Lotke P, Black K, INTRA Writing Group. Worldwide use of intrauterine contraception: a review. *Contraception*. 2014;89:162–73.
19. United Nations Department of Economic and Social Affairs, Division for the Advancement of Women Staff. Trends in contraceptive use worldwide 2015. New York: United Nations Department of Economic and Social Affairs, Division; 2015.
20. Daniels K, Daugherty J, Jones J, Mosher W. Current contraceptive use and variation by selected characteristics among women aged 15–44: United States, 2011–2013. *Natl Health Stat Report*. 2015;(86):1–14.
21. Mosher WD, Moreau C, Lantos H. Trends and determinants of IUD use in the USA, 2002–2012. *Hum Reprod*. 2016;31:1696–702.
22. Jatlaoui TC, Riley HEM, Curtis KM. The safety of intrauterine devices among young women: a systematic review. *Contraception*. 2017;95:17–39.
23. American College of Obstetricians and Gynecologists. ACOG Committee Opinion No. 392, December 2007. Intrauterine device and adolescents. *Obstet Gynecol*. 2007;110:1493–5.
24. Kann L, McManus T, Harris WA, Shanklin SL, Flint KH, Queen B, et al. Youth risk behavior surveillance - United States, 2017. *MMWR Surveill Summ*. 2018;67:1–114.
25. Kost K, Henshaw S. U.S. Teenage pregnancies births and abortions 2010- national and state trends by age race and ethnicity. New York: Guttmacher; 2014. [Internet]. [cited 28 Nov 2018]. Available: <http://www.guttmacher.org/pubs/USTPTrends10.pdf>.
26. Sedgh G, Finer LB, Bankole A, Eilers MA, Singh S. Adolescent pregnancy, birth, and abortion rates across countries: levels and recent trends. *J Adolesc Health*. 2015;56:223–30.
27. Abma JC, Martinez GM. Sexual activity and contraceptive use among teenagers in the United States, 2011–2015. *Natl Health Stat Report*. 2017;(104):1–23.
28. Martinez GM, Abma JC. Sexual activity, contraceptive use, and childbearing of teenagers aged 15–19 in the United States. *NCHS Data Brief*. 2015;(209):1–8.
29. Romero L, Pazol K, Warner L, Gavin L, Moskosky S, Besera G, et al. Vital signs: trends in use of long-acting reversible contraception among teens aged 15–19 years seeking contraceptive services—United States, 2005–2013. *MMWR Morb Mortal Wkly Rep*. 2015;64:363–9.
30. Schubert FD, Herbitter C, Fletcher J, Gold M. IUD knowledge and experience among family medicine residents. *Fam Med*. 2015;47:474–7.
31. Curtis KM, Tepper NK, Jatlaoui TC, Berry-Bibee E, Horton LG, Zapata LB, et al. U.S. medical eligibility criteria for contraceptive use, 2016. *MMWR Recomm Rep*. 2016;65:1–103.
32. Wilson SF, Strohsnitter W, Baecher-Lind L. Practices and perceptions among pediatricians regarding adolescent contraception with emphasis on intrauterine contraception. *J Pediatr Adolesc Gynecol*. 2013;26:281–4.
33. Berlan ED, Pritt NM, Norris AH. Pediatricians’ attitudes and beliefs about long-acting reversible contraceptives influence counseling. *J Pediatr Adolesc Gynecol*. 2017;30:47–52.
34. Barrett M, Soon R, Whitaker AK, Takekawa S, Kaneshiro B. Awareness and knowledge of the intrauterine device in adolescents. *J Pediatr Adolesc Gynecol*. 2012;25:39–42.
35. Fleming KL, Sokoloff A, Raine TR. Attitudes and beliefs about the intrauterine device among teenagers and young women. *Contraception*. 2010;82:178–82.
36. Hall KS, Ela E, Zochowski MK, Caldwell A, Moniz M, McAndrew L, et al. “I don’t know enough to feel comfortable using them:” women’s knowledge of and perceived barriers to long-acting reversible contraceptives on a college campus. *Contraception*. 2016;93:556–64.
37. Payne JB, Sundstrom B, DeMaria AL. A qualitative study of young women’s beliefs about intrauterine devices: fear of infertility. *J Midwifery Womens Health*. 2016;61:482–8.

38. Hoopes AJ, Teal SB, Akers AY, Sheeder J. Low acceptability of certain contraceptive methods among young women. *J Pediatr Adolesc Gynecol.* 2018;31:274–80.
39. Roberts D. *Killing the black body: race, reproduction, and the meaning of liberty.* New York: Vintage Books; 2014.
40. The Norplant Sentence. In: Washington Post [Internet]. The Washington Post; 24 Jan 1991 [cited 28 Nov 2018]. Available: <https://www.washingtonpost.com/archive/opinions/1991/01/24/the-norplant-sentence/aa7453d8-639f-4fa8-bacb-b96e77dc6c0f/>.
41. Walker KM. Judicial control of reproductive freedom: the use of norplant as a condition of probation. *Iowa L Rev.* 1992–1993;78:779.
42. Dehlendorf C, Ruskin R, Grumbach K, Vittinghoff E, Bibbins-Domingo K, Schillinger D, et al. Recommendations for intrauterine contraception: a randomized trial of the effects of patients' race/ethnicity and socioeconomic status. *Am J Obstet Gynecol.* 2010;203:319.e1–8.
43. Gomez AM, Wapman M. Under (implicit) pressure: young Black and Latina women's perceptions of contraceptive care. *Contraception.* 2017;96:221–6.
44. Higgins JA. Celebration meets caution: LARC's boons, potential busts, and the benefits of a reproductive justice approach. *Contraception.* 2014;89:237–41.
45. Trussell J, Lalla AM, Doan QV, Reyes E, Pinto L, Gricar J. Cost effectiveness of contraceptives in the United States. *Contraception.* 2009;79:5–14.
46. Trussell J. Update on and correction to the cost-effectiveness of contraceptives in the United States. *Contraception.* 2012;85:611.
47. Kavanaugh ML, Jerman J, Finer LB. Changes in use of long-acting reversible contraceptive methods among U.S. women, 2009–2012. *Obstet Gynecol.* 2015;126:917–27.
48. Alton TM, Brock GN, Yang D, Wilking DA, Hertweck SP, Loveless MB. Retrospective review of intrauterine device in adolescent and young women. *J Pediatr Adolesc Gynecol.* 2012;25:195–200.
49. Paterson H, Ashton J, Harrison-Woolrych M. A nationwide cohort study of the use of the levonorgestrel intrauterine device in New Zealand adolescents. *Contraception.* 2009;79:433–8.
50. Grunloh DS, Casner T, Secura GM, Peipert JF, Madden T. Characteristics associated with discontinuation of long-acting reversible contraception within the first 6 months of use. *Obstet Gynecol.* 2013;122:1214–21.
51. World Health Organization. *Medical eligibility criteria for contraceptive use.* 3rd ed. Geneva: World Health Organization; 2010. p. 1–17.
52. ACOG Committee Opinion No. 735: adolescents and long-acting reversible contraception: implants and intrauterine devices. *Obstet Gynecol.* 2018;131:e130–e139.
53. Curtis KM, Tepper NK, Jamieson DJ, Marchbanks PA. Adaptation of the World Health Organization's selected practice recommendations for contraceptive use for the United States. *Contraception.* 2013;87:513–6.
54. Curtis KM, Jatlaoui TC, Tepper NK, Zapata LB, Horton LG, Jamieson DJ, et al. U.S. selected practice recommendations for contraceptive use, 2016. *MMWR Recomm Rep.* 2016;65:1–66.
55. Society for Adolescent Health and Medicine. Improving knowledge about, access to, and utilization of long-acting reversible contraception among adolescents and young adults. *J Adolesc Health Care.* 2017;60:472–4.
56. Pregnancy – Society for Adolescent Health and Medicine [Internet]. [cited 28 Nov 2018]. Available: <https://www.adolescenthealth.org/Resources/Clinical-Care-Resources/Sexual-Reproductive-Health/Clinical-Care-Guidelines/Pregnancy.aspx#Contraception>.