

Review

Best Practices for Counseling Adolescents about the Etonogestrel Implant

Elise D. Berlan MD, MPH^{a,*}, Molly J. Richards MD^b, Carolina Sales Vieira MD, PhD^c, Mitchell D. Creinin MD^d, Andrew M. Kaunitz MD^e, Ian S. Fraser MD, DSc^f, Alison Edelman MD, MPH^g, Diana Mansour MBChB^h

^a Department of Pediatrics, Nationwide Children's Hospital, Columbus, OH, USA

^b Department of Pediatrics, Children's Hospital Colorado, Aurora, CO, USA

^c Department of Obstetrics and Gynecology, University of São Paulo University of São Paulo, São Paulo, Brazil

^d Department of Obstetrics and Gynecology, University of California, Davis, Sacramento, CA, USA

^e Department of Obstetrics and Gynecology, University of Florida College of Medicine-Jacksonville, Jacksonville, FL, USA

^f School of Women's and Children's Health, Royal Hospital for Women, University of New South Wales, Randwick, New South Wales, Australia

^g Department of Obstetrics and Gynecology, Oregon Health & Science University, Portland, OR, USA

^h Sexual Health Service, New Crofte Centre, Newcastle upon Tyne, UK

ABSTRACT

Among young persons, ease of use, high efficacy, and high acceptability makes the etonogestrel contraceptive implant an important choice for this age group. Adolescent-friendly, patient-centered counseling considers the patient's cognitive development, the influence of friends and family, as well as their own preferences and values. Age-appropriate language, graphics, and models are useful to explain contraceptive options and relevant side effects. Effectiveness, reversibility, safety, noncontraceptive benefits, and side effects are important attributes and should be discussed when teens are choosing a contraceptive method. In this review we describe suggested best practices for counseling adolescents about the etonogestrel implant so they can make informed, prudent decisions about using this contraceptive method.

Key Words: Humans, Adolescent, Etonogestrel, Pregnancy, Female, Progestins, Unplanned pregnancy, Pregnancy in adolescence, Patient-centered care

Introduction

Unintended pregnancies can adversely affect the lives of adolescents, their children, and families. Efforts to ensure equitable access to contraceptive options for young people who desire pregnancy prevention are vitally important. Its ease of use, high efficacy, and high acceptability among young persons makes the etonogestrel (ENG) contraceptive implant an important choice for this age group. In this review we describe suggested best practices for counseling adolescents about the ENG implant so that they can make informed decisions about using this safe and highly effective contraceptive method.

What is the ENG Implant?

In 1999, a progestin-only subdermal contraceptive implant (Implanon; Merck & Co) containing ENG 68 mg was launched in a number of European countries.¹ The white rod measured 2 mm in diameter and 40 mm in length with ethylene-vinyl-acetate, a copolymer, holding crystals of ENG suspended in its core. The core was encased in an ethylene-vinyl-acetate membrane allowing sustained release of ENG. The implant was licensed to provide contraception for 3 years when inserted subdermally, typically in the inner aspect of the nondominant arm. When launched, this implant was not radiopaque,² the insertion

Dr Berlan is a Merck Nexplanon Clinical Trainer and Consultant to Merck, Bayer, and Ohio Chapter, American Academy of Pediatrics, and a reviewer for UpToDate (royalties received). Dr Richards is a Merck Nexplanon Clinical Trainer and Consultant to Merck. Dr Sales Vieira serves on Medical Advisory Boards and gives lectures for Bayer and Merck. Dr Kaunitz is a Consultant for Merck and Mithra, and an author for UpToDate (royalties received). His institution receives research monies from Abbvie, Merck, and Mithra, and has received travel reimbursement from American College of Obstetricians and Gynecologists and the Centers for Disease Control and Prevention for preparation of guidance regarding contraception and menopause. Dr Edelman is a consultant for Gynuity Health Projects, FHI360, and Nexplanon trainer for Merck (no monies accepted since 2016), and an author for UpToDate (royalties received). Her institution receives research monies from Merck, HRA Pharma, and the National Institutes of Health on projects for which she is principal investigator. These potential conflicts have been reviewed and managed by Oregon Health & Science University. She is the Chair of the American College of Obstetricians and Gynecologists Practice Bulletins for Gynecology committee and has received travel and honoraria from the American College of Obstetricians and Gynecologists. She is an expert technical consultant for the Centers for Disease Control and Prevention and the World Health Organization on reproductive health issues and has received travel reimbursement. Dr Creinin serves on an Advisory Board for Merck & Co and TherapeuticsMD, and is a consultant for Danco, Estetra Mayne, Medicines360, and Merck & Co. The Department of Obstetrics and Gynecology, University of California, Davis, receives research funding for contraceptive research from Daré, HRA Pharma, Medicines360, Merck & Co, and Sebel. Dr Mansour has served on an advisory board for Merck & Co, manufacturer of the etonogestrel implant, and has received financial support to attend pharmaceutical advisory board meetings, undertake research studies, speak at educational meetings, webinars, and conferences, along with travel grants from Bayer, Cilient Healthcare, Gedeon, Merck & Co, Mithra, Mylan, Pfizer, and Vifor Pharma. Dr Fraser indicated no conflicts of interest.

* Address correspondence to: Elise D. Berlan, MD, MPH, Nationwide Children's Hospital, 700 Children's Way, Columbus, OH 43205; Phone: 614-722-2450

E-mail address: Elise.berlan@nationwidechildrens.org (E.D. Berlan).

technique required 2 hands, and the rod was not “locked” in the inserter, which resulted in noninsertion when health care professionals (HCPs) failed to attend training courses or received poor-quality teaching.³ In the United States, a mandatory training program accompanied the 2006 launch of this implant. An active monitoring program showed that of more than 20,000 insertions, only 4 noninsertions were reported.⁴

Approximately 10 years ago, an updated version of the ENG implant called Nexplanon (Merck & Co) or Implanon NXT (Merck & Co) was introduced, with a new inserter and a radiopaque implant. The addition of barium sulfate 15 mg to the rod had no effect on its size, color, flexibility, contraceptive efficacy, or side effect profile. This updated implant system used a single-handed inserter, designed with the goals of facilitating correct subdermal insertion while reducing the chances of noninsertion. Additionally, to minimize the risk of neurovascular injury and implant migration,⁵ Merck updated its insertion site guidance related to technique and insertion location on the arm. The most recent recommendations are to insert the ENG implant subdermally over the triceps muscle, 3–5 cm away from the biceps/triceps sulcus, and approximately 8–10 cm from the medial epicondyle of the humerus (Fig. 1).^{6,7}

Who Is Using the ENG Implant and what Is the Effect?

In 2019, Merck supplied 8.64 million implants globally. The United States, France, Australia, and the United Kingdom are the largest markets for this long-acting reversible contraceptive (LARC; personal communication, Hans Rekers, Merck Inc). More than 80% of users, including teenagers, continue to use this method over 12 months, reporting high rates of satisfaction.^{8–10} The Contraceptive CHOICE Project, a prospective cohort study based in St

Louis that provided same-day, no-cost contraception showed that 34.5% of 14- to 19-year-old adolescents selected the implant when the barriers of cost and availability were removed (485 of 1404 participants).¹¹ In the United Kingdom, teenage pregnancy rates are now at their lowest for 50 years,¹² an accomplishment in part related to attitude changes in young people about becoming parents early in their adult lives and also to increased access to LARCs with more HCPs in family medicine and the community trained to insert ENG implants.¹³ In the United States and Australia, demographic trends are similar and studies show very low pregnancy rates in users of LARC methods, including teens.^{11,14,15}

What is the Evidence for Contraceptive Counseling in Adolescents?

Importance of HCPs

Counseling by HCPs plays an important role in improving adolescents' contraceptive knowledge, acceptability, initiation, and continuation but published evidence specific to this group is scarce. Although adolescent contraceptive decision-making is influenced by friends, family, and social media/internet, teens consistently report that they value HCPs providing accurate information.^{16,17} Adolescents feel that confidentiality in sexual and reproductive health care is of great importance and they appreciate relationships/encounters with providers that are friendly, informal, and nonjudgmental.¹⁸

Influences on Contraceptive Decision-Making

Contraceptive counseling continues to focus on shared decision-making models in which the HCP contributes medical knowledge and the patient provides expertise on their own priorities, values, and preferences.¹⁹ These preferences are influenced by multiple factors including personal contraceptive experiences and experiences of their friends and family.^{16,20,21} Many teens report effectiveness as a priority; however, this does not always translate into choosing the most effective method.²² Other non-contraceptive priorities include the desire for regular monthly, lighter or no bleeding, improvement of acne, avoidance of a foreign body, or ability to stop their method independently.²³

Adolescents' fears play a role in decision-making and should be addressed. Common concerns include effect on fertility, safety of amenorrhea, and the absence of autonomy in LARC removal.^{24–27} HCPs should be prepared to help teens have access to removal if and when they desire discontinuation. Teens value HCP discussion and might specifically ask for decision support but also value autonomy in decision-making.¹⁸ HCPs must be aware of their own agenda in adolescent counseling and avoid undue pressure or influence.

Awareness of Adolescent Development and Learning Needs

It is important that HCPs have an awareness of an adolescent's developmental stage. Younger adolescents rely

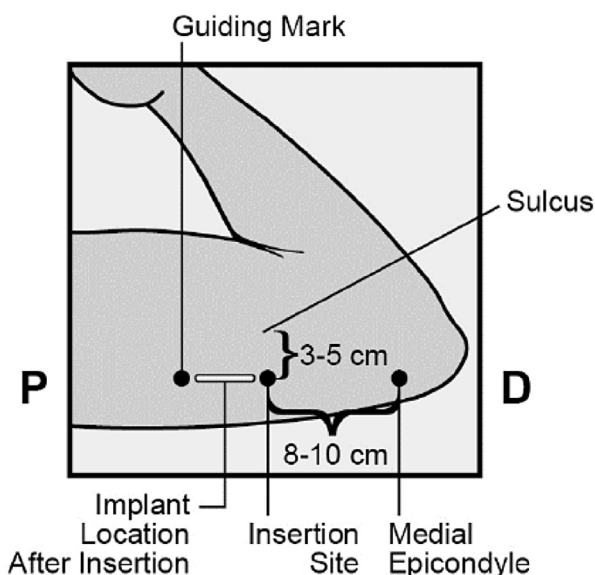


Fig. 1. Etonogestrel implant insertion site. P = proximal (toward the shoulder); D = distal (toward the elbow). Reproduced with permission from Merck and Co.⁶

Table 1
Recommendations for Contraception Counseling With Adolescents*

Recommendation	Sample Language
Speak to all adolescents 1-on-1	I am happy to see you with your friend/mother but will also chat with you by yourself as well
Discuss confidentiality and limits of confidentiality	Everything you say to me will be kept confidential/private unless I have concerns about your safety or the safety of those around you. If I feel a possible need to break confidentiality, I will discuss this with you first
Ask about contraceptive priorities and preferences (eg, effectiveness, convenience, medical indications, lack of side effects)	Is there a contraceptive method that interests you? What is important to you about your contraceptive method? Do you want to have a monthly bleed? What do you think about having less frequent bleeds or even no bleeds?
Ask about personal contraceptive experiences	What have you used in the past? What did you like about it? What was not so good about it?
Ask about experiences of friends and/or family members on contraception	What are your friends or family using? What have they said about the method?
Address fears and concerns about contraceptive methods	Is there anything that concerns you about birth control methods? Is there anything you have heard about birth control methods that scares or worries you?
Consider dispelling common myths/misconceptions	Some of my patients worry that not having a period is not healthy. It is important to know that not having a period while using birth control is normal and healthy for your body. There is no back-up of blood or risk to your fertility. Your period should come back normally after stopping birth control Patients have told me they worry about their ability to get pregnant after using birth control. No birth control method causes infertility. In fact, with many methods you can get pregnant within days or weeks of stopping them
Assure teens they are not “committed” to use of a method for a certain period of time and assure autonomy in removal of long-acting reversible contraceptive methods	Although some of these methods last for years, you do not need to use them for that long. The method can work for “up to” that number of years. You have flexibility. If you decide the method doesn’t work for you or if you want to get pregnant, you can always have it removed
Discuss possible side effects and plan for managing them	Everyone responds differently to birth control. If you have any concerns or unwanted side effects, please call us or make a follow-up appointment. We might have ways to help with the side effects or we can discuss stopping your method

* Models or pictures of the pelvis/uterus as well as models of different contraceptive methods (pill pack, ring, implant, intrauterine device) are helpful to have available when counseling.

more on concrete thinking and as teens age they are increasingly capable of abstract thinking. Comfort in initiating sensitive discussions or asking questions, and ability to understand and process information can differ according to age and developmental stage. Frequent checks for understanding (“teach back”) and encouragement of questions is important. Adolescents’ preferences around parental involvement in contraception decision-making are also influenced by their cognitive and psychosocial development. HCPs should discuss possible side effects in plain language regardless of whether these are nuisance side-effects or possible health risks, then share a plan for managing these (ie, contact HCP, follow-up in clinic, treatment options).²⁸

Adolescents might have poor knowledge about their bodies and contraception. Models and visual aids can clarify their views on anatomy, physiology (reasons for amenorrhea), insertion (intrauterine device, implant, ring) and help dispel fears about devices (size, rigidity, movement in the body).^{17,18} Models can be obtained from a variety of sources. Planned Parenthood League of Massachusetts offers a comprehensive teaching kit with models.²⁹ Youth-friendly visual aids and educational materials are available from Bedsider/Power to Decide.³⁰ Despite concerns that teens might have difficulty with complex decision-making, they are capable of weighing risks and benefits of methods and choosing one they feel is most appropriate for them.^{18,31} **Table 1** includes a summary of recommendations for contraception counseling with adolescents.

Which Features of the ENG Implant Are Most Important to Discuss?

Effectiveness, reversibility, safety, noncontraceptive benefits, and side effects are important attributes and should be discussed when teens are choosing a contraceptive method.^{22,32,33} It is also important to inform young persons that the implant does not prevent sexually transmitted infections and to recommend the use of condoms with sexual intercourse.

Effectiveness

The ENG implant is highly effective for pregnancy prevention.³⁴ The 3-year cumulative pregnancy rate of the implant is 0.4 per 100 women per year (95% confidence interval, 0.1–1.4).³⁵ No pregnancies were reported in a publication that summarized 11 clinical trials of almost 1000 ENG users.³⁶ Post marketing surveillance of more than 20,000 insertions showed only 6 confirmed contraceptive failures during a 6.4-year period (0.03% with a 95% confidence interval of 0.01%–0.05%).⁴

Reversibility

An essential feature of any LARC is its immediate reversibility and no effect on future fertility.^{7,8} A comprehensive review of pregnancy rates after contraceptive implant discontinuation showed the 1-year pregnancy rate

after cessation ranged between 76.5% and 85.6% after exclusion of 1 study with unusually low pregnancy rates.³⁷ A more recent systematic review and meta-analysis had similar findings.³⁸ This range overlaps with pregnancy rates reported after discontinuation of oral contraceptives or use of no contraceptive method.^{39,40}

Safety

The ENG implant has few contraindications, with current breast cancer and pregnancy being absolute contraindications.⁴¹ It does not cause clinical changes in blood pressure, carbohydrate metabolism, and lipid profile,^{42–44} and because it is estrogen-free, it does not affect the risk of arterial and venous thromboembolism.⁴⁴ For this reason, it can be used in a variety of women with comorbid conditions.⁴¹

Noncontraceptive Benefits

In persons with dysmenorrhea (N = 923), 83% note improvement with ENG implant use (77% resolution, 6% decrease in severity).⁴⁵ The ENG implant also reduces noncyclic chronic pelvic pain and dysmenorrhea associated with endometriosis-associated pelvic pain.^{46,47} Because the ENG implant suppresses ovulation, it likely has the ability to help in any cycle-related disorders.

What Changes in Vaginal Bleeding Do ENG Implant Users Experience?

Changes in vaginal bleeding are common while using the ENG implant. In clinical trials with users 18–40 years of age, participants experienced a range of bleeding patterns. Figure 2 depicts bleeding during the first year of ENG implant use. Of importance, when evaluating bleeding

patterns during any 90-day interval, a person's pattern in one interval might be different in future intervals. Overall, 60% of participants' bleeding in the first 90-day reference period was characterized as favorable (ie, amenorrhea, infrequent bleeding, and normal-frequency bleeding), and participants with favorable bleeding were highly likely to continue with favorable bleeding through at least 2 years.⁴⁸ For those whose vaginal bleeding during the first reference period was characterized as unfavorable (ie, frequent bleeding and/or any prolonged bleeding), future bleeding patterns were less predictable with 40%–50% reporting a more favorable pattern in the next 2 of 3 reference periods. Not surprisingly, users with unfavorable bleeding were more likely to discontinue the ENG implant,⁴⁸ and 11.3% of the overall participants discontinued ENG implant use because of bleeding irregularities,⁴⁵ citing “frequent, irregular bleeding” or “prolonged menstrual flow” in most cases.

During the first 2 years of use, the mean prevalence of amenorrhea during any 90-day reference period was 22.2%, infrequent bleeding (<3 bleeding or spotting episodes per 90 days) 33.6%, normal frequency bleeding (3–5 bleeding or spotting episodes per 90 days) 37.5%, frequent bleeding (>5 bleeding or spotting episodes per 90 days) 6.7%, and prolonged bleeding or spotting (>14 days uninterrupted per 90 days) 17.7%.⁴⁵ Unfavorable bleeding patterns, such as frequent and/or prolonged bleeding, decreased during the first 2 years of use (from 38% to 18%).⁴⁵ Mean bleeding and spotting days per 90 day reference period was 17.7, and mean bleeding days was 7.2.⁴⁵

Contraception-induced vaginal bleeding changes are frequently cited as reasons for nonuse, discontinuation, and dissatisfaction.⁴⁹ Changes in bleeding are a leading cause for early ENG implant discontinuation in adults and adolescents.^{49–53} Therefore, these changes should be addressed during counseling (Box 1).

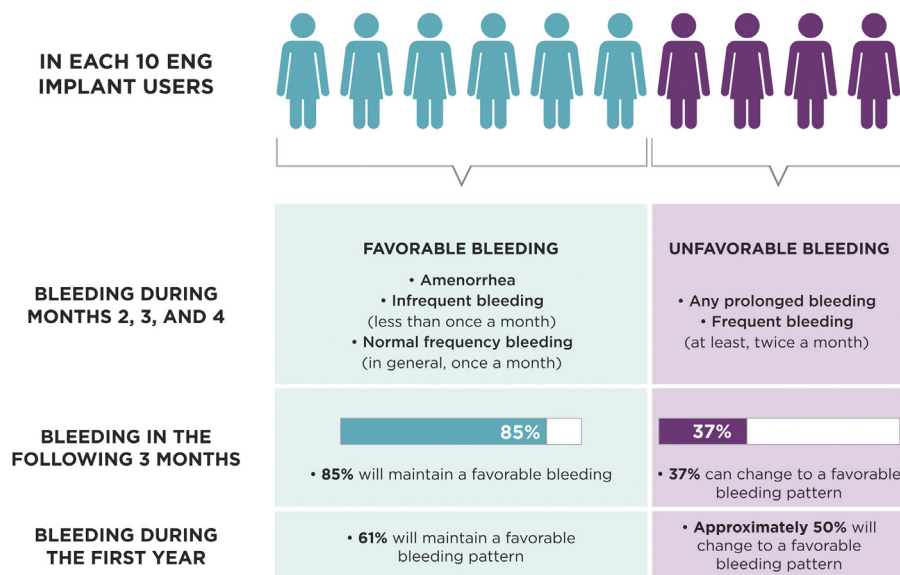


Fig. 2. Vaginal bleeding during first year of etonogestrel implant use. Adapted from Mansour et al.⁴⁸

Box 1. How Do You Counsel Adolescents about Changes in Their Bleeding?

It is important to be clear about changes in bleeding but avoid categorizing them as “good” or “bad” because patients have different subjective experiences. It is also important to stress that, regardless of the changes, most users experience light bleeding.

You are likely to experience a change in your bleeding on this method. -or-

Your bleeding will be unpredictable with this method, but most of the bleeding tends to be light. -or-

Irregular bleeding with the implant is normal and not dangerous but might be bothersome to you. -and-

I want you to let me know if you are concerned or unhappy with your bleeding with the implant. We might want to check if there is anything other than the implant that could be causing your bleeding, such as an infection. Some of my patients just want reassurance that there is nothing else wrong with them and that the bleeding is not dangerous and is an expected side effect in some implant users. If your bleeding is bothersome, we have medicines that could help the bleeding, or we can remove the implant and try something else.

What Other Side Effects Are Associated with Use of the ENG Implant?

Few studies have specifically examined side effects in adolescent users. Potential side effects should be addressed during counseling (Box 2).

Weight Gain

Studies on weight gain in ENG implant users have suffered from methodologic flaws and have often been contradictory.^{54–57} In clinical trials that excluded women over 130% their ideal body weight, US participants reported gaining a mean of 2.8 pounds within the first year and 3.7 pounds over 2 years of ENG implant use; 2.3% reported weight gain as the reason for implant removal.⁶ A recently published study of adolescents showed no difference in weight changes between ENG implant users and nonusers (which included oral contraceptive users) at 2-year follow-up.⁵⁷ The highest-quality studies on weight gain and ENG implant, after controlling for relevant confounders, showed little or no weight changes; any changes observed were less than the average weight gain for nonusers over the same period of time.^{58,59}

Mood Changes

In clinical trials of 942 subjects, 60 (6.4%) participants reported emotional lability and 52 (5.5%) reported depression, with 3.3% of participants citing these as the reason for discontinuation.^{2,6} Mood changes have been described in observational studies of ENG implant use and are an infrequent reason for discontinuation.^{50,53,54,60} No studies have

assessed mood changes and the ENG implant using validated instruments.⁶¹

Acne

Acne is reported as a side effect of ENG implant use. Etonogestrel is a third-generation progestin and is weakly androgenic. Thirteen percent of clinical trial participants (N = 942) reported acne as an adverse event and 1.3% discontinued because of acne.^{2,6} Acne was assessed in 642 participants: 15% had improvement in acne, 14% had worsening acne, and 71% had no change.² It is possible that the acne experienced by some implant users was due to discontinuing an estrogen-containing hormonal contraceptive (which improves acne) rather than starting a progestin-only implant.

Bone Density

In contrast with the injectable depot medroxyprogesterone acetate, which suppresses ovarian estradiol production, estradiol levels remain physiologic in ENG implant users.^{62,63} Accordingly, loss of bone mineral density (BMD) would not be anticipated in users. Few high-quality studies have assessed ENG implant-associated changes in BMD and none have examined adolescents, whose use of hormonal contraceptives during peak BMD accrual has attracted attention. Studies of forearm trabecular bone BMD at 18 months and 36 months showed no difference compared with baseline for users of the ENG implant.^{64,65} Prospective studies showed no change in BMD among ENG implant users compared with copper intrauterine device-using women at lumbar spine and femoral neck at 12 and 24 months, the sites where BMD is most predictive of fracture risk.^{56,66}

Ovarian Cysts

Because the ENG implant effectively inhibits ovulatory activity, users might experience painless and transient enlargement of ovarian follicles or cysts.^{67,68} In published series, no intervention was necessary, and changes resolved within 7–72 days.^{67,68}

Box 2. How Do You Counsel Adolescents about Side Effects?

As with any medication, it is possible to experience side effects with use of the implant. Changes in bleeding patterns are the most common. It does not look like the implant normally causes weight gain problems or mood changes, but everyone responds differently and if you have any concerns, I want you to get in touch with me.

What Are Potential Challenges with Inserting and Removing the ENG Implant?

Less than 10% of users experience insertion site reactions (ie, erythema, hematoma, bruising, pain, and swelling;

Box 3).⁶ Although uncommon, deep insertions have been associated with paresthesia due to neural injury and implant migration due to insertion into the muscle or fascia (Box 4).^{4,69} Vascular migration of ENG implants is extremely rare. There were 107 reported cases of implant migration to the pulmonary artery or chest between August 1998 and September 2019.⁷ Nonpalpable implants should be localized and then removed by a procedural specialist with appropriate expertise.^{70,71}

Box 3. How Do You Counsel Adolescents about Post Placement Wound Care?

You might experience some tenderness and bruising at the site. I recommend that you keep the site clean and dry for the next couple of days. You should remove the pressure bandage in 24 hours and keep the adhesive dressing on the site for the following 3–4 days. If you notice that the site is very tender, red, swollen, or has greenish-yellow draining, please contact the office, because these could be signs of an infection.

Box 4. How Do You Counsel Adolescents about Risks of Serious Adverse Events?

This is one of the safest birth control methods available. Although there are reports of deep insertions and movement of the implant to other parts of the body, these are very rare. In fact, because it does not contain estrogen, using the implant is safer than using birth control pills. It is important that you can always feel the implant. If you ever notice you can't feel it, please let me know. If that happens, we will do some tests to locate the implant and it should be removed. We can always place another one if you would like.

Conclusion

The ENG implant is an excellent contraceptive option for adolescents. Adolescent-friendly, patient-centered counseling considers the patient's cognitive development, the influence of friends and family, as well as their own preferences and values. Age-appropriate language, graphics, and models are useful to explain contraceptive options and relevant side effects. Patients who choose the contraceptive implant should understand that changes in menstrual bleeding patterns are expected and are not harmful. Concerns should be thoroughly addressed, and reassurance given that the implant can be removed at any time.

References

1. Family Planning Association: FPA fact sheet. Contraception: past, present and future. Available: <http://www.fpa.org.uk/sites/default/files/contraception-past-present-and-future-factsheet-november-2010.pdf>. Accessed January 5, 2020.
2. Blumenthal PD, Gemzell-Danielsson K, Marintcheva-Petrova M: Tolerability and clinical safety of Implanon. *Eur J Contracept Reprod Health Care* 2008; 13(suppl 1):29
3. Mansour D: Nexplanon®: what Implanon® did next. *J Fam Plan Reprod Health Care* 2011; 36:187
4. Creinin MD, Kaunitz AM, Darney PD, et al: The US etonogestrel implant mandatory clinical training and active monitoring programs: 6-year experience. *Contraception* 2017; 95:205
5. Iwanaga J, Fox MC, Rekers H, et al: Neurovascular anatomy of the adult female medial arm in relationship to potential sites for insertion of the etonogestrel contraceptive implant. *Contraception* 2019; 100:26
6. FDA: US Food and Drug Administration: Merck and Co I. Highlights of prescribing information. Available: https://www.merck.com/product/usa/pi_circulars/n/nexplanon/nexplanon_pi.pdf. Accessed February 12, 2020.
7. EMC: Letters to HCPs. Nexplanon 68 mg implant UK DHPC 15-Jan-2020. Direct healthcare professional communication on the association of Nexplanon – etonogestrel 68 mg, implant for subdermal use. Update to the insertion and removal instructions to minimise the risks of neurovascular injury and implant migration. Available: <https://www.medicines.org.uk/emc/dhpc/1662/Document>. Accessed February 10, 2020.
8. Agostini A, Godard C, Laurendeau C, et al: Two year continuation rates of contraceptive methods in France: a cohort study from the French national health insurance database. *Eur J Contracept Reprod Health Care* 2018; 23:421
9. Diedrich JT, Klein DA, Peipert JF: Long-acting reversible contraception in adolescents: a systematic review and meta-analysis. *Am J Obstet Gynecol* 2017; 216:364.e1
10. Rosenstock JR, Peipert JF, Madden T, et al: Continuation of reversible contraception in teenagers and young women. *Obstet Gynecol* 2012; 120:1298
11. Secura GM, Madden T, McNicholas C, et al: Provision of no-cost, long-acting contraception and teenage pregnancy. *N Engl J Med* 2014; 371:1316
12. Office for National Statistics: Conceptions in England and Wales. 2018. Available: <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/conceptionandfertilityrates/bulletins/conceptionstatistics/2018>. Accessed March 25, 2020.
13. Connolly A, Pietri G, Yu J, et al: Association between long-acting reversible contraceptive use, teenage pregnancy, and abortion rates in England. *Int J Womens Health* 2014; 6:961
14. Lewis LN, Doherty DA, Hickey M, et al: Implanon as a contraceptive choice for teenage mothers: a comparison of contraceptive choices, acceptability and repeat pregnancy. *Contraception* 2010; 81:421
15. Pew Research Center: Why is the teen birth rate falling?. Available: <https://www.pewresearch.org/fact-tank/2019/08/02/why-is-the-teen-birth-rate-falling>. Accessed April 17, 2020.
16. Cohen R, Sheeder J, Kane M, et al: Factors associated with contraceptive method choice and initiation in adolescents and young women. *J Adolesc Health* 2017; 61:454
17. Rubin SE, Felsher M, Korich F, et al: Urban adolescents' and young adults' decision-making process around selection of intrauterine contraception. *J Pediatr Adolesc Gynecol* 2016; 29:234
18. Brown MK, Auerswald C, Eyre SL, et al: Identifying counseling needs of nulliparous adolescent intrauterine contraceptive users: a qualitative approach. *J Adolesc Health* 2013; 52:293
19. Fox E, Reyna A, Malcolm NM, et al: Client preferences for contraceptive counseling: a systematic review. *Am J Prev Med* 2018; 55:691
20. Yee L, Simon M: The role of the social network in contraceptive decision-making among young, African American and Latina Women. *J Adolesc Health* 2010; 47:374
21. Paul R, Huysman BC, Maddipati R, et al: Familiarity and acceptability of long-acting reversible contraception and contraceptive choice. *Am J Obstet Gynecol* 2020; 222:S884.e1
22. Marshall C, Guendelman S, Mauldon J, et al: Young women's contraceptive decision making: do preferences for contraceptive attributes align with method choice? *Perspect Sex Reprod Health* 2016; 48:119
23. Egarter C, Frey Tirri B, Bitzer J, et al: Women's perceptions and reasons for choosing the pill, patch, or ring in the CHOICE study: a cross-sectional survey of contraceptive method selection after counseling. *BMC Womens Health* 2013; 13:9
24. Gomez AM, Freihart B: Motivations for interest, disinterest and uncertainty in intrauterine device use among young women. *Matern Child Health J* 2017; 21:1753
25. Potter J, Rubin SE, Sherman P: Fear of intrauterine contraception among adolescents in New York City. *Contraception* 2014; 89:446
26. Bracken J, Graham CA: Young women's attitudes towards, and experiences of, long-acting reversible contraceptives. *Eur J Contracept Reprod Health Care* 2014; 19:276
27. 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
28. Lunde B, Littman L, Stimmel S, et al: "Just wear dark underpants mainly": Learning from adolescents' and young adults' experiences with early discontinuation of the contraceptive implant. *J Pediatr Adolesc Gynecol* 2017; 30:395
29. Planned Parenthood League of Massachusetts: Protection methods demonstration kit. Available: <https://www.plannedparenthood.org/planned-parenthood-massachusetts/local-training-education/materials-resources>. Accessed May 6, 2020.

30. Power to Decide: Educational materials. Available: <https://shop.powertodecide.org/educational-materials.html>. Accessed May 6, 2020.
31. Jaccard J, Levitz N: Counseling adolescents about contraception: towards the development of an evidence-based protocol for contraceptive counselors. *J Adolesc Health* 2013; 52(4 suppl):S6
32. Wyatt KD, Anderson RT, Creedon D, et al: Women's values in contraceptive choice: a systematic review of relevant attributes included in decision aids. *BMC Womens Health* 2014; 14:28
33. Madden T, Secura GM, Nease RF, et al: The role of contraceptive attributes in women's contraceptive decision making. *Am J Obstet Gynecol* 2015; 213:46.e1
34. Jensen J, Creinin MD, editors. Speroff and Darney's Clinical Guide to Contraception, (6th). New York, Wolters Kluwer, 2019, pp 15
35. Bahamondes L, Brache V, Meirik O, et al: A 3-year multicentre randomized controlled trial of etonogestrel- and levonorgestrel-releasing contraceptive implants, with non-randomized matched copper-intrauterine device controls. *Hum Reprod* 2015; 30:2527
36. Darney P, Patel A, Rosen K, et al: Safety and efficacy of a single-rod etonogestrel implant (Implanon): results from 11 international clinical trials. *Fertil Steril* 2009; 91:1646
37. Mansour D, Gemzell-Danielsson K, Inki P, et al: Fertility after discontinuation of contraception: a comprehensive review of the literature. *Contraception* 2011; 84:465
38. Gorum T, Wasie A: Return of fertility after discontinuation of contraception: a systematic review and meta-analysis. *Contracept Reprod Med* 2018; 3:9
39. Hassan MAM, Killick SR: Is previous aberrant reproductive outcome predictive of subsequently reduced fecundity? *Hum Reprod* 2004; 20:657
40. Hassan J, Kulenthiran A, Thum YS: The return of fertility after discontinuation of oral contraception in Malaysian women. *Med J Malaysia* 1994; 49:348
41. Curtis KM, Tepper NK, Jatlaoui TC, et al: U.S. medical eligibility criteria for contraceptive use, 2016. *MMWR Recomm Rep* 2016; 65:1
42. Guazzelli CAF, De Queiroz FT, Barbieri M, et al: Etonogestrel implant in adolescents: evaluation of clinical aspects. *Contraception* 2011; 83:336
43. Lopez LM, Grimes DA, Schulz KF: Steroidal contraceptives: effect on carbohydrate metabolism in women without diabetes mellitus. *Cochrane Database Syst Rev* 2012; 4:CD006133
44. Glisic M, Shahzad S, Tsoli S, et al: Association between progestin-only contraceptive use and cardiometabolic outcomes: a systematic review and meta-analysis. *Eur J Prev Cardiol* 2018; 25:1042
45. Mansour D, Korver T, Marintcheva-Petrova M, et al: The effects of Implanon® on menstrual bleeding patterns. *Eur J Contracept Reprod Health Care* 2008; 13(suppl 1):13
46. Carvalho N, Margatho D, Cursino K, et al: Control of endometriosis-associated pain with etonogestrel-releasing contraceptive implant and 52-mg levonorgestrel-releasing intrauterine system: randomized clinical trial. *Fertil Steril* 2018; 110:1129
47. Walch K, Unfried G, Huber J, et al: Implanon® versus medroxyprogesterone acetate: effects on pain scores in patients with symptomatic endometriosis - a pilot study. *Contraception* 2009; 79:29
48. Mansour D, Fraser IS, Edelman A, et al: Can initial vaginal bleeding patterns in etonogestrel implant users predict subsequent bleeding in the first 2 years of use? *Contraception* 2019; 100:264
49. Polis CB, Hussain R, Berry A: There might be blood: a scoping review on women's responses to contraceptive-induced menstrual bleeding changes. *Reprod Health* 2018; 15:114
50. Flore M, Chen X, Bonney A, et al: Patients' perspectives about why they have their contraceptive Implanon NXT device removed early. *Aust Fam Physician* 2016; 45:740
51. Peterson AM, Brown A, Savage A, et al: Prevalence of early discontinuation and associated factors among a retrospective cohort of etonogestrel contraceptive implant users. *Eur J Contracept Reprod Health Care* 2019; 24:475
52. Berlan E, Mizraji K, Bonny AE: Twelve-month discontinuation of etonogestrel implant in an outpatient pediatric setting. *Contraception* 2016; 94:81
53. Cohen R, Sheeder J, Teal SB: Predictors of discontinuation of long-acting reversible contraception before 30 months of use by adolescents and young women. *J Adolesc Health* 2019; 65:295
54. Lakha F, Glasier AF: Continuation rates of Implanon® in the UK: data from an observational study in a clinical setting. *Contraception* 2006; 74:287
55. Vickery Z, Madden T, Zhao Q, et al: Weight change at 12 months in users of three progestin-only contraceptive methods. *Contraception* 2013; 88:503
56. Modesto W, Dal'Ava N, Monteiro I, et al: Body composition and bone mineral density in users of the etonogestrel-releasing contraceptive implant. *Arch Gynecol Obstet* 2015; 292:1387
57. Romano ME, Braun-Courville DK: Assessing weight status in adolescent and young adult users of the etonogestrel contraceptive implant. *J Pediatr Adolesc Gynecol* 2019; 32:409
58. Colditz GA, Willett WC, Stampfer MJ, et al: Patterns of weight change and their relation to diet in a cohort of healthy women. *Am J Clin Nutr* 1990; 51:1100
59. Bahamondes L, Brache V, Ali M, et al: A multicenter randomized clinical trial of etonogestrel and levonorgestrel contraceptive implants with nonrandomized copper intrauterine device controls: effect on weight variations up to 3 years after placement. *Contraception* 2018; 98:181
60. Weisberg E, Bateson D, McGeehan K, et al: A three-year comparative study of continuation rates, bleeding patterns and satisfaction in Australian women using a subdermal contraceptive implant or progestogen releasing-intrauterine system. *Eur J Contracept Reprod Health Care* 2014; 19:5
61. Worly BL, Gur TL, Schaffir J: The relationship between progestin hormonal contraception and depression: a systematic review. *Contraception* 2018; 97:478
62. Kaunitz AM, Darney PD, Ross D, et al: Subcutaneous DMPA vs. intramuscular DMPA: a 2-year randomized study of contraceptive efficacy and bone mineral density. *Contraception* 2009; 80:7
63. Murat Inal M, Yildirim Y, Ertopcu K, et al: Effect of the subdermal contraceptive etonogestrel implant (Implanon®) on biochemical and hormonal parameters (three years follow-up). *Eur J Contracept Reprod Health Care* 2008; 13:238
64. Bahamondes L, Monteiro-Dantas C, Espejo-Arce X, et al: A prospective study of the forearm bone density of users of etonogestrel- and levonorgestrel-releasing contraceptive implants. *Hum Reprod* 2006; 21:466
65. Monteiro-Dantas C, Espejo-Arce X, Lui-Filho JF, et al: A three-year longitudinal evaluation of the forearm bone density of users of etonogestrel- and levonorgestrel-releasing contraceptive implants. *Reprod Health* 2007; 4:11
66. Beerhuizen R, van Beek A, Massai R, et al: Bone mineral density during long-term use of the progestagen contraceptive implant Implanon® compared to a non-hormonal method of contraception. *Hum Reprod* 2000; 15:118
67. Mäkäräinen L, Van Beek A, Tuomivaara L, et al: Ovarian function during the use of a single contraceptive implant: Implanon compared with Norplant. *Fertil Steril* 1998; 69:714
68. Hidalgo MM, Lisondo C, Juliato CT, et al: Ovarian cysts in users of Implanon® and Jadelle® subdermal contraceptive implants. *Contraception* 2006; 73:532
69. Kang S, Niak A, Gada N, et al: Etonogestrel implant migration to the vasculature, chest wall, and distant body sites: cases from a pharmacovigilance database. *Contraception* 2017; 96:439
70. Odom EB, Eisenberg DL, Fox IK: Difficult removal of subdermal contraceptive implants: a multidisciplinary approach involving a peripheral nerve expert. *Contraception* 2017; 96:89
71. Matulich MC, Chen MJ, Schimmoeller NR, et al: Referral center experience with nonpalpable contraceptive implant removals. *Obstet Gynecol* 2019; 134:801