An updated guide to contraception

Part 2: Long-acting reversible methods

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This second article in an updated three-part series on contraception covers long-acting reversible methods – hormonal and copper-bearing intrauterine devices and the contraceptive implant – which are associated with a lower risk of unintended pregnancy than shorter-acting contraceptive methods. The contraceptive injection is no longer considered a long-acting reversible method, but it continues to play an important role for some women and is included in this article.

Long-acting reversible contraception (LARC) methods, namely the intrauterine devices (IUDs) and the contraceptive subdermal implant, have several advantages over other contraceptive methods. LARC methods are highly effective and relatively inexpensive over time compared with combined hormonal methods, as well as having the benefit of 'fit and forget'. One year after their initiation, the IUD (copper or levonorgestrel) and the etonogestrel (ENG) implant have a

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KEY POINTS

- Long-acting reversible contraception (LARC) methods are highly acceptable and offer cost-effective, efficacious contraception.
- The contraceptive implant and intrauterine devices (IUDs) have similar high efficacies in both typical and perfect use.
- There are few absolute or relative contraindications to LARC methods and few serious risks associated with their use.
- Use of LARC has not been shown to have a long-term effect on fertility once the method has been stopped.
- The depot medroxyprogesterone acetate (DMPA) injection is no longer considered a LARC method, because of its lower typical-use efficacy and lack of immediate reversibility, but it continues to play an important role for some women.
- The efficacy of IUDs and the DMPA injection is not affected by the concurrent use of medications that induce liver enzymes.
- The benefits of LARC methods should be discussed with women who present for renewal of oral contraceptive pill or vaginal ring prescriptions.

continuation rate of about 85%, compared with about 65% for depot medroxyprogesterone acetate (DMPA) injections and combined hormonal contraception.[1] In addition, women using implants and IUDs have a 20 times lower risk of pregnancy compared with women using combined hormonal contraceptive methods.[2] There is a high uptake of LARC methods by women who are given accurate advice about them.[3] Their use in Australia increased from 3% in 2002[4] to 11% in 2013.[5]

This article, the second in an updated series of three, includes important information to consider when initiating LARC methods and DMPA injections, as well as some of the common clinical issues that arise during their use. Although the DMPA injection is no longer considered a LARC method due to its lower efficacy in typical use,[6] resulting from the need to return for an injection every three months and its unpredictable reversibility, it is included here because it still plays an important role for some women. Other contraceptive methods are covered in other articles in the series. The first, published in the October 2018 issue of *Medicine Today*, covered aspects of contraception history taking and consultations on contraception choices and discussed the short-acting methods: the contraceptive pills and the vaginal ring. The third article, to be published in a subsequent issue, will cover other methods (barrier, permanent, fertility awareness-based, lactational amenorrhoea and withdrawal) and emergency contraception.

The Medical Eligibility Criteria (MEC) tables for contraceptive use are an internationally recognised system for categorising the risk of various contraceptive methods in women with specific medical conditions (Table 1).[7] This categorisation is a useful guide for clinicians in the safe provision of contraceptive methods and is referred to throughout this article.

TABLE 1. UK MEDICAL ELIGIBILITY CRITERIA (MEC) FOR CONTRACEPTIVE METHODS[7]

Category	Definition
MEC 1	A condition for which there is no restriction on the use of the method
MEC 2	A condition where the advantages of using the method generally outweigh the theoretical or proven risks
MEC 3	A condition where the theoretical or proven risks usually outweigh the advantages of using the method. The provision of a method requires expert clinical judgement and/or referral to a specialist contraceptive provider, because use of the method is not usually recommended unless other more appropriate methods are not available or not acceptable
MEC 4	A condition that represents an unacceptable health risk if the method is used

Hormonal and copper IUDs

Two types of IUDs are available in Australia: copper and levonorgestrel (LNG). Standard and short-length copper IUDs are available, lasting either five or 10 years. The LNG IUD (marketed as Mirena) lasts for up to five years. Extended use until menopause can be considered for a woman in whom a copper IUD is inserted at the age of 40 years or older, or for a woman aged 45 years or older in whom an LNG IUD is inserted, because of decreasing fertility in this age group.[8] Lower-dose hormonal IUDs with smaller frames (marketed in other countries as Kyleena, Jaydess or Skyla, lasting five, three and three years, respectively) may be encountered during consultations but are not yet available in Australia.

The LNG IUD is PBS listed. Although copper IUDs are not PBS listed, they remain cost effective at a cost of about $90, particularly the 10-year devices.

IUDs can be inserted in the primary care setting after the practitioner has completed competency-based training. Although medical indemnity provider requirements vary, additional premiums are generally not required. GPs inserting IUDs are responsible for ensuring they maintain their clinical competence. Insertion of fewer than 10 IUDs over a six- to 12-month period is associated with a higher perforation rate than insertion of greater numbers.[9] It is recommended that an assistant be present during insertion and that all practitioners maintain the skills and equipment needed to deal with emergencies, specifically vasovagal reactions, which can occasionally be profound. Where insertion difficulties are predicted or encountered, referral to a gynaecologist or clinic with facilities for sedation or general anaesthesia should be considered.[10] IUD removal is a simple procedure that can be performed by all GPs.

Mechanisms of action and efficacy

Both types of IUD act by inhibiting sperm migration to the upper genital tract, inhibiting ovum transport and preventing implantation. In addition, the LNG IUD causes endometrial changes (including atrophy), thickens cervical mucus (preventing sperm penetration) and prevents or delays ovulation in some users, especially during early use. Annual failure rates are estimated to be 0.1% for the LNG IUD and 0.5% for the copper IUD.[11] The T-shaped devices appear to be the most effective of the copper devices.[12] The efficacy of copper IUDs is slightly lower in women aged 18 to 29 years compared with women in older age groups.[11]

Initiating IUDs

Both types of IUD can be initiated at any age and used until menopause. Nulliparity is not a contraindication. An Australian study in a family planning clinic setting found that, although 20% of insertions in nulliparous women were rated as difficult,

almost 90% of nulliparous women had a successful insertion.[13] Use of IUDs in adolescents in Australia remains relatively low, but they are recognised by the American College of Obstetricians and Gynecologists as a first-line adolescent contraceptive method,[14] and demand in this age group appears to be increasing in Australia.

Insertion of IUDs should occur at a time when pregnancy can be confidently excluded, although a copper IUD may be used for emergency contraception after unprotected intercourse, before implantation of a fertilised ovum. The 'quick start' method of initiation, which can be used for the contraceptive implant and DMPA injection, cannot be used for IUDs because of the potential for an adverse effect on an ongoing pregnancy.

The copper IUD is always immediately effective after insertion. The LNG IUD is immediately effective when inserted on day one to day seven of a normal menstrual cycle and at other specified times, as outlined in Box 1. In most other situations, it will be effective after seven days.

Contraindications

There are few MEC 3 or 4 contraindications to the use of IUDs (Table 2). The most important considerations are undiagnosed abnormal vaginal bleeding, significant distortion of the uterine cavity, cervical infection, current or recent pelvic inflammatory disease and, for women considering an LNG IUD, current or past breast cancer.

Choosing between a copper and hormonal IUD

The differences between copper and hormonal IUDs that can assist women in choosing between the two types are outlined in Table 3.

Examination and investigations

A bimanual and speculum examination is performed before inserting an IUD, noting the position and size of the uterus, the presence of abnormal discharge and any abnormalities that might interfere with IUD insertion or require investigation. This can be done on the day of insertion, when appropriate.

There are no recommendations for routine pre-IUD investigations in asymptomatic women who have a normal examination. A cervical screening test should be performed if due, and screening for chlamydia and gonorrhoea should be

1. TIMING OF EFFECTIVENESS OF INTRAUTERINE DEVICES AFTER PREGNANCY HAS BEEN EXCLUDED

- The copper IUD is always effective immediately, with no additional contraceptive requirement
- The LNG IUD will be effective immediately, with no additional contraceptive requirement, in the following situations:
  - on day one to day seven of a normal menstrual cycle
  - on day one to day seven for women who menstruate regularly, when changing from a copper IUD*
  - when replacing an LNG IUD, provided it is within its recommended time frame for removal*
  - when changing from an ENG implant inserted within the previous three years or a DMPA injection given within the previous 14 weeks
  - at the time of a surgical abortion
  - within five days of completion of a medical abortion or miscarriage
- It is advised to continue the combined oral contraceptive (active hormone pills) or vaginal ring for a further seven days after insertion of an LNG IUD
- The LNG IUD will not be effective until seven days after insertion if:
  - insertion is after day seven of a normal menstrual cycle
  - the woman is ceasing the progestogen-only pill
  - it is more than five days after a medical abortion

* Seven days of abstinence or condom use before an IUD changeover is advised to cover the possibility of a failed reinsertion and the presence of surviving sperm in the upper genital tract.

Abbreviations: DMPA = depot medroxyprogesterone acetate; ENG = etonogestrel; IUD = intrauterine device; LNG = levonorgestrel.

TABLE 2. CONDITIONS POSING A HEALTH RISK FOR USE OF INTRAUTERINE DEVICES (UK MEC 3 AND 4 CONDITIONS)

Condition		MEC category	
		Copper IUD	LNG IUD
Personal characteristics and reproductive history			
Postpartum: breastfeeding or nonbreastfeeding, including after caesarean section	48 hours to <4 weeks	3	3
	Puerperal sepsis	4	4
Post-abortion sepsis		4	4
Cardiovascular disease			
Ischaemic heart disease, stroke or TIA that develops during use (in women with pre-existing disease at initiation, use of LNG IUD is MEC 2 and copper IUD is MEC 1)		1	3
Breast and reproductive tract conditions			
Current breast cancer		1	4
Past breast cancer		1	3
Unexplained vaginal bleeding (suspicious for serious condition) before evaluation, at initiation (continuation of either method is MEC 2 if develops during use)		4	4
Gestational trophoblastic disease (includes hydatidiform mole, invasive mole and placental tumour) – persistently elevated beta-hCG levels or malignant disease		4	4
Gestational trophoblastic disease (includes hydatidiform mole, invasive mole and placental tumour) – decreasing beta-hCG levels		3	3
Cervical cancer awaiting treatment at initiation (continuation of either method is MEC 2 if develops during use)		4	4
Endometrial cancer awaiting treatment at initiation (continuation of either method is MEC 2 if develops during use)		4	4
Distorted uterine cavity (any congenital or acquired uterine abnormality distorting the uterine cavity in a manner that is incompatible with IUD insertion)		3	3
Pelvic inflammatory disease at initiation (continuation of either method is MEC 2 if develops during use)		4	4
Gonorrhoeal infection, symptomatic chlamydia infection or purulent cervicitis at initiation (continuation of either method is MEC 2 if develops during use)		4	4
Asymptomatic chlamydia infection at initiation (continuation of either method is MEC 2 if develops during use)		3	3
Pelvic tuberculosis (continuation of either method is MEC 3 if develops during use)		4	4
HIV infection			
HIV infected and CD4 count <200 cells/mcL at initiation (continuation of either method is MEC 2 if develops during use)		3	3
Gastrointestinal conditions			
Severe (decompensated) cirrhosis		1	3
Hepatocellular adenoma or malignant liver tumour		1	3

Adapted from: Clinical Effectiveness Unit. UK medical eligibility criteria for contraceptive use. London: Faculty of Sexual & Reproductive Healthcare; 2016.[7]
Abbreviations: beta-hCG = beta human chorionic gonadotropin; IUD = intrauterine device; LNG = levonorgestrel; MEC = Medical Eligibility Criteria; TIA = transient ischaemic attack.

TABLE 3. COMPARISON OF COPPER AND LEVONORGESTREL INTRAUTERINE DEVICES

Feature	Copper IUD	LNG IUD
Cost	About $90, varies from $70 to $180, not PBS subsidised	PBS subsidised (for contraception or heavy menstrual bleeding)
Efficacy	99.5%	99.9%
Menstrual effects	• 20 to 50% increase in menses • Dysmenorrhoea and anaemia • MEC 2 if heavy menstrual bleeding present or develops, and for endometriosis	• About 80% reduction in menses • Increased spotting in first three to five months • About 5% persistent spotting • Amenorrhoea or light bleeding common by 12 months (up to 65%)
Hormonal side effects	Nil	Acne, breast tenderness, headaches and weight gain reported
Hormonal contraindications	Nil	• MEC 4 if breast cancer present • MEC 3 if IHD or stroke develops during use
Duration of use before replacement	• Up to 10 years (five years for some device types) • If woman aged 40 years or older at insertion, any copper IUD can be left until menopause is confirmed	• Up to five years • If woman aged 45 years or older at insertion, can be left until menopause is confirmed
Menopause masked	No	Possibly
Used for emergency contraception	Yes	No
Used as progestogen component of menopausal hormone therapy	No	Yes (within five years of insertion)

Abbreviations: IHD = ischaemic heart disease; IUD = intrauterine device; LNG = levonorgestrel; MEC = Medical Eligibility Criteria.

considered for women who are at risk of sexually transmitted infections (STIs), particularly women under the age of 30 years.[15]

Women with a history of abnormal vaginal discharge or who are clinically assessed as having bacterial vaginosis on examination require investigation before IUD insertion. Bacterial vaginosis requires treatment before or at the time of IUD insertion. Asymptomatic women diagnosed with chlamydia or gonorrhoea should, where possible, be treated before insertion (see Case Study 1 in Box 2).[16] For a woman diagnosed with pelvic inflammatory disease, insertion should be deferred until treatment is completed and her symptoms have completely resolved.[15]

Women choosing to use a hormonal IUD who have heavy menstrual bleeding require appropriate investigation before insertion, including measurement of serum ferritin levels and a transvaginal ultrasound on day five to day 10 of the cycle to check endometrial thickness and exclude hyperplasia malignancy and other serious conditions. The woman should be reviewed six months after insertion to ensure symptoms have resolved.[17]

Benefits

The copper and LNG IUDs have several advantages over other contraceptive methods, as they are fit-and-forget methods that provide cost-effective, highly efficacious and long-acting contraception. Both are rapidly reversible on removal and do not affect lactation or infant development.[18,19] Their efficacy is not reduced by liver enzyme-inducing medications or malabsorption conditions, and they can be good alternatives for women unable to use oestrogen-containing contraception.[20]

The LNG IUD is associated with a significant decrease in heavy menstrual bleeding and a reduction in dysmenorrhoea, which can be useful for the management of endometriosis-associated pain.[21,22]

The copper IUD is the only highly effective reversible nonhormonal method; it can be used as emergency contraception when inserted within five days of unprotected intercourse and will then provide ongoing contraception for up to 10 years.[23]

Side effects

Expulsion

There is an overall risk of IUD expulsion of about 5%, with the highest risk within the first year of use.[10] Women should be advised to check for the presence of the IUD threads monthly (after menstruation if it occurs).

Bleeding patterns

Up to 65% of women using the LNG IUD will have amenorrhoea or light bleeding by 12 months of use.[24,25] Unscheduled light bleeding is common during the first three to six months for women using either type of IUD, particularly for LNG IUD

2. CASE STUDY 1. INTRAUTERINE DEVICES AND CHLAMYDIA INFECTION

Jin is 24 years old and would like to have a levonorgestrel intrauterine device (IUD) inserted for contraception. She is in a monogamous relationship of seven months' duration and has had one termination. She forgets to take the pill and prefers an IUD to an implant or injection. Her age puts her in a higher risk group for sexually transmitted infections, so she is screened for chlamydia with a polymerase chain reaction (PCR) test of a swab from her endocervix. As she is asymptomatic and the vaginal discharge appears normal, vaginal swabs for culture are not necessary. Her bimanual examination is unremarkable.

Jin's chlamydia test result is positive. Both she and her partner are treated with azithromycin 1g immediately and abstain from sex for seven days. There are no clinical signs of pelvic inflammatory disease. Jin's partner's test result is also positive. A chlamydia PCR test result can remain falsely positive despite adequate treatment for several weeks after treatment, but Jin is anxious to have her IUD inserted soon.[16] You explain there is a high chance that the treatment will be successful, and you agree to insert her IUD in one week's time.

If Jin had been diagnosed with clinical pelvic inflammatory disease, this should have been treated with the standard antibiotic regimen and IUD insertion delayed until there was complete resolution of signs and symptoms.[7]

users, who may experience daily light bleeding for about three to four months, after which improvement can be expected.[26] Copper IUD users can expect heavier, more prolonged menstrual bleeding, which may be more painful. It is important to provide information at the time of insertion about how to manage heavier bleeding with NSAIDs or tranexamic acid.

Pelvic pain and unacceptable menstrual bleeding patterns, including amenorrhoea in LNG IUD users and increased bleeding in copper IUD users, are the most common reasons for discontinuation.[27,28]

Pregnancy

Although the overall risk of pregnancy in women using IUDs is extremely low, a pregnancy that does occur has a higher risk of being ectopic, compared with pregnancies in women not using an IUD.[11]

If pregnancy does occur, it is important to determine its location with a transvaginal ultrasound and remove the IUD as soon as possible, provided the woman is in the first trimester. An IUD must always be removed before medical termination of pregnancy and for a continuing pregnancy if possible; if an IUD is not removed, there is a high risk of second-trimester miscarriage, infection or premature delivery.[29,30] As the pregnancy progresses, the threads are drawn upwards, making them difficult to locate.

Pelvic infection

In the first 20 days after IUD insertion, there is a small increased risk of procedure-related pelvic inflammatory disease, which may be related to an undiagnosed STI.[31] After the first 20 days, the risk of pelvic infection relates to the user's risk of STIs rather than the presence of the IUD. Apart from procedure-related infection, women with an IUD are at no higher risk of pelvic inflammatory disease than women without an IUD.[32] Treatment for pelvic inflammatory disease should be initiated, with review for a response after 48 to 72 hours; if the symptoms have abated, the IUD can be left in place. Prompt specialist referral is required for women who are not improving by this time, to assess the possibility of a rare but serious infection. Pelvic inflammatory disease requires a minimum of two weeks of antibiotic therapy, and follow up and recall systems should ensure that complete resolution occurs.

Hormonal side effects

Although systemic levels of LNG are very low, hormonal side effects, including acne, headache, mood changes, breast

3. CASE STUDY 2. MISSING INTRAUTERINE DEVICE THREADS

Marita returns for a check-up after having a copper intrauterine device (IUD) inserted five weeks earlier. She is at day 12 of a 28-day cycle and has experienced no side effects from her IUD. Her last period was normal. On examination, the threads of the IUD cannot be seen. You attempt to bring the threads down by placing a cytobrush into her cervical canal and rotating it, without success.

You work on the assumption that Marita's IUD is not in place in the uterus, although there is a good chance her IUD will be correctly positioned and the threads are just drawn up. If Marita has had unprotected sex in the past five days, offer her emergency contraception (see the Flowchart). As she had a normal period only 12 days ago, a pregnancy test is not yet useful. You organise a pelvic ultrasound and ask that an abdominal x-ray be performed if the IUD cannot be seen on ultrasound – both copper and hormonal IUDs can be visualised by x-ray. An x-ray will locate an IUD that has perforated the uterus and become extrauterine.

The ultrasound shows the IUD is correctly positioned in the uterus. You tell Marita that her IUD will continue to work and, although she will be unable to check the threads, she is likely to see the IUD if it is expelled. Vigilance is particularly needed during menstruation – the time expulsion is most likely to occur. You also warn her that removal may be more difficult and may require referral to a specialist.

tenderness and weight gain, have been reported by some users of the LNG IUD.[27] There is a higher systemic exposure to LNG during the first few months of use, and most hormonal symptoms appear to settle over time.[33] There is no evidence of a causal link between LNG IUD use and weight gain.[34]

A Danish national database study found an increased risk of a diagnosis of depression and first prescription of an antidepressant medication in women, especially adolescents, using hormonal methods of contraception, including hormonal IUDs, although a causal association could not be determined.[35] Although mood disorders are not a contraindication, IUD users should be advised to return for review should symptoms occur or worsen.

An increased risk of simple ovarian cysts has also been reported, but most are asymptomatic and resolve spontaneously, as for women without an LNG IUD.[36]

Figure. The etonogestrel implant.

Other side effects

Some male partners report discomfort during intercourse because of IUD threads. This is best avoided by cutting the threads just long enough to sweep behind the cervix (about three to four centimetres from the external os). If the discomfort persists, it may be necessary to cut the threads flush with the os, with the understanding that this will make it harder to check for the presence of the device and may make removal more difficult. Some IUD users experience an increase in vaginal discharge.[37]

Serious risks

Perforation

Perforation of the uterus occurs in about two per 1000 IUD insertions, with increased rates during breastfeeding and in the first six months after giving birth.[38] Although perforation usually presents soon after insertion, it can be asymptomatic, with delayed detection even years later, so it is essential that it is considered in all cases of 'missing threads' (see Case Study 2 in Box 3).[9] Laparoscopic removal of the IUD under general anaesthesia may be required in cases of perforation.

Special situations and management of complications

Missing threads

The management of a woman in whom the threads of the IUD cannot be seen is discussed in Case Study 2 in Box 3 and summarised in the Flowchart.

Infections

The management of a woman wanting to use an IUD who tests positive for chlamydia is discussed in Case Study 1 in Box 2.[16]

Contraceptive implant

The contraceptive subdermal implant is a progestogen-only contraceptive. The only contraceptive implant available in Australia is a single ethylene vinyl acetate rod that slowly releases the progestogen ENG (Figure). The implant (marketed as Implanon NXT) is listed on the PBS. It lasts for up to three years, after which it needs to be removed and, if desired, replaced. Clinicians also need to be aware of two-rod implant systems (Jadelle and Sinoplant) that are available in other countries (including New Zealand), which release levonorgestrel over a five-year time frame.

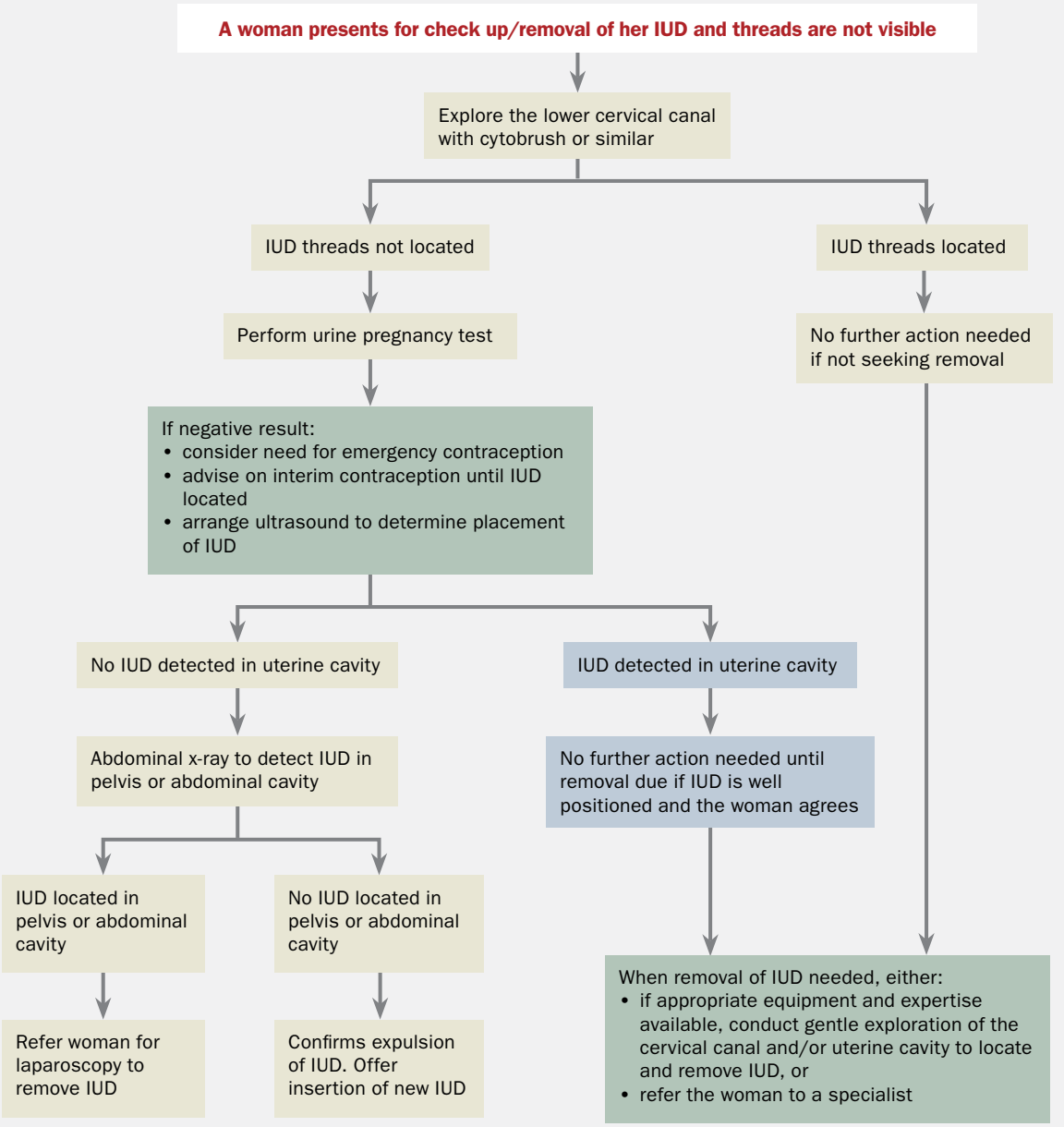
Mechanism of action and efficacy

The ENG implant effectively inhibits ovulation and thickens cervical mucus. It has an estimated failure rate of 0.05% in both typical and perfect use.[39] This means that fewer than one in 1000 women will have a pregnancy during each year of use.

Initiating implants

An implant is effective immediately if inserted on day one to day five of a normal menstrual cycle. It can be initiated at other times using the quick start method (Box 4), which requires seven days of use before contraceptive protection is achieved.[40] There

MANAGEMENT OF A WOMAN WITH MISSING IUD THREADS



Abbreviation: IUD = intrauterine device.
Adapted from: Guillebaud J. Contraception: your questions answered. London: Churchill Livingstone; 2004.

are no reports of teratogenicity with the implant, but an unintended pregnancy is best diagnosed early to enable consideration of all options, whether that be to continue with the pregnancy and access antenatal care or to terminate the pregnancy.

Contraindications

There are few absolute or relative contraindications (MEC 3 or 4) to use of the implant, and it can be used by most women of reproductive age from menarche until menopause, with the exception of women with current or past breast cancer (MEC 4 and 3, respectively) (Table 4).[7]

The continued use of the ENG implant is relatively strongly contraindicated (MEC 3) in women who develop arterial disease during use. For example,

4. QUICK START METHOD

The 'quick start' method involves initiation of contraception outside the recommended time stated in the product information, such as on the day of the consultation, when it may not always be possible to confidently exclude an imminent conception or very early pregnancy. A detailed sexual and menstrual history should be taken and a urine pregnancy test performed, with the understanding that a pregnancy test can continue to give a negative result for up to three weeks after an episode of unprotected sex that results in conception. Informed decision making is important – if early pregnancy cannot be excluded when using the quick start method, a pregnancy test in four weeks' time (to include the seven days while waiting for the implant to become effective) is essential, regardless of whether bleeding occurs.[15]

5. BENEFITS OF ETONOGESTREL IMPLANT

The benefits of the etonogestrel implant are that it:

- is an extremely effective long-acting reversible contraceptive method
- is effective for up to three years before replacement is necessary
- is rapidly reversible on removal
- reduces dysmenorrhoea

consideration should be given to removal in a woman who experiences a myocardial infarction or stroke while using an ENG implant.

Drug interactions

Liver enzyme-inducing medications, which include several antiepileptics, antiretrovirals and the herbal remedy St John's wort, reduce the effectiveness of the ENG implant.[41,42] It is recommended that women taking these medications use either an intrauterine contraceptive method or the DMPA injection.[20]

Examination and investigations

In well women commencing use of the ENG implant, a blood pressure check is the only examination necessary, although a baseline measurement of body mass index (BMI) is useful for documentation of weight gain as a perceived side effect.[15] No other routine investigations are necessary.

Benefits

The ENG implant is a highly effective and cost-effective contraceptive, with minimal action required on the part of the user (Box 5). As a nonoral method, it can be useful for women with inflammatory bowel disease or other malabsorptive conditions. It reduces dysmenorrhoea, and some women may find the possibility of amenorrhoea desirable.[43] The implant is also an option for women with medical contraindications to, or unacceptable side effects from, oestrogen-containing contraceptives, including a history of venous thromboembolism.

Insertion and removal of implants are well within the scope of all GPs, although completion of a short training course to ensure correct placement and removal techniques is a necessary requirement or expectation of most medical indemnity providers.[44]

Side effects and disadvantages

Many side effects are attributed to the ENG implant, but evidence for a causal association is limited. Headaches, mood changes including emotional lability, weight gain, breast tenderness and loss of libido have been reported by users.[45] A Danish national

TABLE 4. CONDITIONS POSING A HEALTH RISK FOR USE OF ENG IMPLANTS AND DMPA INJECTIONS (UK MEC 3 AND 4 CONDITIONS)

Condition	MEC category	
	ENG implant	DMPA injection
Arterial disease and risk factors		
Multiple risk factors for cardiovascular disease (e.g. older age, smoking, diabetes, hypertension and obesity)	2	3
Hypertension with vascular disease	2	3
History of ischaemic heart disease, stroke or TIA at initiation	2	3
Development of ischaemic heart disease, stroke or TIA during use	3	3
Breast and reproductive tract conditions		
Unexplained vaginal bleeding (suspicious for a serious condition) before evaluation	3	3
Current breast cancer	4	4
Past breast cancer	3	3
Gastrointestinal conditions		
Severe (decompensated) cirrhosis	3	3
Hepatocellular adenoma or malignant liver tumour	3	3

Abbreviations: DMPA = depot medroxyprogesterone acetate; ENG = etonogestrel; MEC = Medical Eligibility Criteria; TIA = transient ischaemic attack.

Adapted from: Clinical Effectiveness Unit. UK medical eligibility criteria for contraceptive use. London: Faculty of Sexual & Reproductive Healthcare; 2016.[7]

6. MANAGEMENT OF TROUBLESOME BLEEDING WITH ENG IMPLANTS OR DMPA INJECTIONS[47]

First-line options are:
- a combined hormonal contraceptive taken continuously or cyclically for three months
- a five-day course of an NSAID such as mefenamic acid 500 mg two or three times daily
- a five-day course of tranexamic acid 500 mg twice daily, particularly if bleeding is heavy.

Second-line options, with low-level, anecdotal or conflicting evidence, are:
- tranexamic acid 500 mg twice daily for five days for lighter bleeding
- norethisterone 5 mg three times daily for 21 days
- levonorgestrel progestogen-only pill, 30 mcg twice daily for 20 days
- early removal and replacement of implant or shortening of interval between injections from 12 to 10 weeks

Abbreviations: DMPA = depot medroxyprogesterone acetate; ENG = etonogestrel.

7. CASE STUDY 3. FREQUENT BLEEDING WITH ENG IMPLANT

Ellie, aged 20 years, had an ENG implant inserted two years ago. She complains of frequent episodes of bleeding, which have increased over the past six months. A chlamydia test result is negative.

You consider the treatments for frequent or prolonged bleeding with ENG implants (see Box 6), although you are aware they have been shown to have only a short-term effect. Ellie has no contraindications to oestrogen but when she previously used the combined contraceptive pill, she would sometimes forget to take it, which is why she chose the implant. You reassure her that, in this situation, missing a pill will not affect her contraceptive cover. You prescribe three cycles of a combined contraceptive pill to settle the bleeding and advise her to take the active pills continuously. Ellie returns 14 weeks later, stating that her bleeding restarted once she stopped taking the pill. She mentions that a friend had a similar problem, and her bleeding settled after having her implant changed early.

The mechanism of unscheduled bleeding that occurs with progestogen-only contraception is poorly understood, and there is no strong evidence to guide your management. Ellie could either continue to take the combined contraceptive pill cyclically or in an extended-cycle regimen or she could have her implant changed early on the assumption that, for her, returning to the higher serum levels of ENG associated with initial use may restore her original bleeding pattern. However, she needs to understand that there is no guarantee of this.

Abbreviations: DMPA = depot medroxyprogesterone acetate; ENG = etonogestrel.

database study found an increased risk of depression and first prescription of an antidepressant medication in women, especially adolescents, using hormonal methods of contraception, including implants, although a causal association could not be determined.[35] Although mood disorders are not a contraindication to use of an implant,[7] users should be advised to return for review should symptoms occur or worsen.

It is important to inform women initiating the ENG implant that their bleeding pattern will change from their usual menstrual cycle and to provide specific information on the range of expected bleeding patterns. The bleeding pattern can vary from amenorrhoea in about 20% of women to frequent bleeding (more than five episodes per 90 days) or prolonged bleeding (an episode lasting more than 14 days) in 25%.[46] It is not possible to predict which pattern of bleeding may occur for a woman, and patterns may even change between implants, so it can be useful to explore the woman's attitudes to unpredictable bleeding before initiation. At the time of insertion, users should also be provided with information about strategies for managing troublesome bleeding, should it occur (see Box 6 and Case Study 3 in Box 7).[47]

Weight gain is a frequently reported side effect of the ENG implant,[43,45] although consistent causal evidence of an effect is lacking.[34,48] Users may develop acne; however, acne may be improved in users in whom it is pre-existing.[43]

Insertion and removal of the ENG implant may cause scarring and local reaction and carry a small risk of infection. Deep insertion may sometimes occur, in which case specialist intervention is required for removal. Removal of impalpable implants should only be attempted under ultrasound guidance because of the risk of damage to surrounding neurovascular structures.

Serious risks

Available evidence does not suggest an increased risk of venous thromboembolism with ENG implants,[49] and progestogen-only contraceptive methods do not appear to increase the risk of cardiovascular disease, even in smokers.[50,51]

Management of special situations

Late for implant replacement

The management of a woman presenting late for a three-yearly ENG implant replacement is summarised in Box 8.

Frequent or prolonged bleeding

The management of a woman with an ENG implant presenting with frequent bleeding is discussed in Case Study 3 in Box 7, and treatment options for frequent or prolonged bleeding are outlined in Box 6.[47]

Contraceptive injection

The contraceptive injection (marketed as Depo-Provera or Depo-Ralovera) is a progestogen-only method delivering DMPA 150 mg as an intramuscular injection every 12 ± 2 weeks. It is PBS listed. It works by inhibiting ovulation and thickening the cervical mucus.

Although over 99% effective in perfect use, it is less effective than the implant and IUDs in typical use because of the need to return to the clinic for repeat injections, with up to four in 100 users becoming pregnant during the first year

8. LATE ENG IMPLANT REPLACEMENT OR DMPA INJECTION[15]

A woman presenting late for a three-yearly ENG implant replacement or a DMPA injection should be advised to:

- have a urine pregnancy test but be aware of its limitations in not excluding conception in the past three weeks
- consider levonorgestrel emergency contraception if there has been unprotected sex in the previous five days
- have the ENG implant inserted or the DMPA injection, unless she prefers to wait until early pregnancy can be excluded
- use condoms for the next seven days
- have a pregnancy test in four weeks' time, regardless of bleeding.

Abbreviations: DMPA = depot medroxyprogesterone acetate; ENG = etonogestrel.

of use.[6] A lower-dose subcutaneous formulation of medroxyprogesterone acetate, which can be self-injected every 12 weeks, is available in other countries and removes the need for regular clinic attendance.[52]

Initiation

The injection is effective immediately if initiated on day one to day five of a normal menstrual cycle, as well as in specific other circumstances (Box 9). Although it is preferable to exclude early pregnancy before administration, DMPA can be initiated using the quick start method, even when there is a small risk of an undetectable early pregnancy, if the woman could be put at higher risk of an unintended pregnancy as a result of a delayed start (Box 4).[40] There are no reports of teratogenic effects if an injection is inadvertently given in early pregnancy.[53] It takes seven days for the injection to become effective using the quick start method, and a pregnancy test four weeks after initiation is essential. Women who present late (more than 14 weeks) for a repeat injection can be managed as summarised in Box 8. They can be given the option of an immediate injection using quick start, rather than a deferred injection with a urine pregnancy test performed after three weeks of abstinence or protected intercourse (see Case Study 4 in Box 10).

Contraindications

Like all hormonal methods, DMPA is MEC 4 and 3, respectively, for women with current or past breast cancer. It is also MEC 3 (risks outweigh the benefits) in women with multiple cardiovascular risk factors, including a history of ischaemic heart disease, stroke or transient ischaemic attacks (Table 4).[7] DMPA is not a first choice for women at risk of bone density loss, including those using long-term steroids or with immobility issues.[15,20]

Drug interactions

DMPA is not affected by concurrent use of liver enzyme-inducing drugs and may be a contraceptive of choice in this instance.

Examination and investigations

A blood pressure check is the only examination required at initiation and annually, although a baseline BMI measurement may be useful, as weight gain is a recognised side effect of DMPA. Routine bone density testing is not recommended, but annual review of risk factors for bone loss is advised. Measurement of lipid levels is recommended for women with cardiovascular risk factors who are considering this contraceptive method.

Benefits

DMPA is highly effective and relatively cost-effective. It can be used by women with malabsorptive conditions and may be useful for those with endometriosis and heavy menstrual bleeding, given its effect on reducing dysmenorrhoea and menstrual blood loss, with at least 50% of women using DMPA becoming amenorrhoeic.[55,56]

The concept of reproductive coercion is increasingly recognised within the spectrum of intimate partner violence and includes situations in which the use of contraception may need to be hidden from a partner.[57] As DMPA can be easily concealed from others, it may be the most appropriate choice in this context.

9. TIMING OF EFFECTIVENESS OF THE ENG IMPLANT AND DMPA INJECTION[15]

The ENG implant and DMPA injection will be effective immediately, with no requirement for additional contraceptive protection, when initiated in the following situations:

- on day one to day five of a normal menstrual cycle
- when changing from an implant inserted within the previous three years or a DMPA injection given within the previous 14 weeks
- on day one to day five of the menstrual cycle when switching from a copper IUD
- any time within five days of an abortion or miscarriage
- any time within 21 days of giving birth.

When switching from a combined hormonal contraceptive to an implant or DMPA, it is advised to continue active hormone pills or the vaginal ring for a further seven days after insertion or administration to prevent potential pregnancy from previous intercourse.

The ENG implant and DMPA will become effective after seven days, with additional contraceptive precautions required during this time, when initiated in the following situations:

- after day five of a normal menstrual cycle
- after day five of the menstrual cycle when switching from a copper IUD*
- when switching from a hormonal IUD*
- when switching from a POP to an implant or DMPA.

* Condoms or abstinence are advised for seven days before IUD removal, or, if practical, the implant or DMPA can be commenced seven days before removal to maintain contraceptive cover.

Abbreviations: DMPA = depot medroxyprogesterone acetate; ENG = etonogestrel; IUD = intrauterine device; POP = progestogen-only pill.

Side effects and disadvantages

Headache, mood changes, breast tenderness and loss of libido have been reported by users.[55] Use of DMPA appears to be associated with weight gain in some users, especially adolescents who are

10. CASE STUDY 4. LATE DMPA INJECTION

Rozita, aged 25 years, presents two weeks late for a repeat DMPA injection. As this is her first visit to your practice, you contact the previous practice and ascertain that it is 16 weeks and five days since her previous injection. She is now therefore nearly three weeks beyond the recommended maximum injection interval of 14 weeks.

Rozita has continued to have unprotected sex, most recently yesterday. You suggest she takes the levonorgestrel emergency contraception pill, obtainable from a pharmacy, as soon as possible. A urine pregnancy test result is negative, and you explain to her that this does not rule out an early or potential pregnancy, although the chance of this is low within 17 weeks of the last injection.[54]

You discuss with Rozita the options of either using an interval method of contraception (condoms or pills) and returning in three weeks' time for a repeat pregnancy test or having the injection now and arranging a pregnancy test in four weeks, telling her that although DMPA is not considered teratogenic, this cannot be completely excluded.[53] She chooses to have her injection now. You advise her to use condoms for the next seven days and arrange a pregnancy test for four weeks from now, regardless of bleeding, placing a reminder for recall in your clinical software program. You ask her to put reminders in her phone for both her pregnancy test and her next injection in 12 weeks' time.

You provide Rozita with information on the 'fit and forget' benefit of the contraceptive implant and IUDs. She is very happy with the amenorrhoea caused by DMPA, so is not keen to change methods at this point.

Abbreviations: DMPA = depot medroxyprogesterone acetate; IUD = intrauterine device.

already overweight. Studies suggest that early weight gain predicts later increases, with continuing weight gain for the 20 to 25% of women who gained more than 5% of body weight in the first six months.[58-60]

Once given, the effect of the DMPA injection cannot be immediately reversed. There can be a delay in return to fertility of up to 18 months after DMPA discontinuation, but there is no evidence of long-term reduction in fertility in past users.[61]

Although irregular spotting or bleeding can occur, at least 50% of users are amenorrhoeic by 12 months of use.[55] Management of troublesome bleeding is outlined in Box 6.

Use of DMPA is associated with about a 7% mean reduction in hip and spine bone density compared with nonusers over a period of four years.[62] This effect is considered reversible in adult users;[63] the limited information available for adolescents shows that it may be substantially or fully reversible in this age group.[64,65] Evidence on fracture risk is inconclusive.[66,67] Because of the theoretical concerns relating to its impact on bone density, use of DMPA in adolescents aged under 18 years and women over 45 years is classified as MEC 2. This means that, although not always a first choice, DMPA can be used for women in whom other methods are unsuitable. New users should have a detailed assessment and receive advice regarding osteoporosis risk factors; this should occur every two years for continuing users.[15]

Although progestogen-only contraceptives do not appear to increase the risk of cardiovascular disease, even in smokers,[50,51] there is a theoretical concern about DMPA's hypo-oestrogenic effect on reducing HDL-cholesterol levels.[68] It is advised to switch to another contraceptive method at the age of 50 years, as the risks of DMPA to both bone health and cardiovascular health (due to its effect on lipids) generally outweigh the benefits.[69]

Conclusion

LARC methods, including the contraceptive implant and copper and hormonal IUDs, have low failure rates and few contraindications. Uptake of these fit-and-forget methods is increasing in Australia.[4] They offer several benefits over other contraceptive methods and can be considered as first-line methods of contraception in most situations. GPs are ideally placed to provide access to and information on all LARC methods and to either initiate their use or, in the case of IUDs, ensure there is a rapid referral pathway in place for insertion if they are not providing this service. The benefits of LARC methods should be discussed with women who present for renewal of oral contraceptive pill or vaginal ring prescriptions. MT

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A list of references is included in the online version of this article (www.medicinetoday.com.au).

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An updated guide to contraception

Part 2: Long-acting reversible methods

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