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Long-acting contraceptives



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About the expert



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After completing my medical degree at Trinity College Dublin, I worked at the Rotunda Hospital and then King's College Hospital in London. In 1983, I came to New Zealand and joined Family Planning, becoming the Medical Director and National Medical Spokesperson from 1988-1992. In 1991, I completed the MPH at Yale University in New Haven and on my return took up an academic position in the Department of Obstetrics and Gynaecology, University of Auckland. I was Associate Professor of Women's Health until my retirement at the end of 2017. At present, I continue my contraception and menopause clinic at Greenlane clinical centre and work as a certifying consultant at Epsom Day Unit.

Abbreviations used in this review

CI = confidence interval
FSRH = Faculty of Sexual and Reproductive Healthcare
GP = general practitioner
IUD(s) = intrauterine devices
IUS(s) = intrauterine system(s)
LARC(s) = long-acting reversible contraceptives
RANZCOG = Royal Australian and New Zealand College of Obstetricians and Gynaecologists
RR = relative risk
STI(s) = sexually transmitted infection(s)
UKMEC = United Kingdom Medical Eligibility Criteria for Contraceptive use

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Long-acting reversible contraceptives (LARCS) provide a very effective method of contraception and they do not require ongoing effort on the part of the women. This review outlines the benefits, as well as any potential management considerations associated with the use of the LARCs currently available in New Zealand. In addition, the use of LARCs in specific patient populations is briefly reviewed. This publication has been commissioned by Bayer. The production of the content is entirely independent, but has been reviewed by Bayer for technical accuracy prior to publication.

Benefits of long-acting contraceptives

LARCs are methods of birth control which provide effective contraception for an extended period without requiring user action and include intrauterine devices (IUDs) and contraceptive implants.^{1,2}

LARCs are a very effective form of contraception. The estimated percentage of women experiencing an unintended pregnancy within the first year of typical use was <1% with LARCs, but 6% with injectable contraceptives, 9% with the oral contraceptive pill, and 18% using a male condom.³ In addition, the 'typical use' failure rates of LARCs are about the same as 'perfect use' failure rates.³

As well as being highly effective, LARCs offer a number of other benefits to users (**Table 1**).¹⁻³

Table 1. Benefits of long-acting reversible contraceptives

- Most effective reversible contraceptive methods available¹⁻³
- Do not require ongoing effort from the woman - "fit and forget"^{2,4}
- Require fewer visits to healthcare professionals^{2,4}
- High rates of user satisfaction as indicated by high continuation rates⁵⁻⁸
- Easily reversible with rapid return to fertility^{9,10}
- More cost effective than oral contraceptives or injectable contraceptives^{9,10}
- Associated with fewer contraindications than oral contraceptives¹¹⁻¹³
- Suitable for women of all ages and parity, including young nulliparous women^{2,14-18}

A major advantage of LARCs, compared with other reversible contraceptive methods, is that they do not require ongoing effort on the part of the woman in order to be effective.^{2,4} Compared with other shorter-acting forms of contraception which may require regular use on a daily, weekly, monthly, or quarterly basis, LARCs are associated with high rates of continuation and patient satisfaction.⁵⁻⁸ In the US contraceptive CHOICE Project, involving more than 9000 women of reproductive age, LARC users were more likely than non-LARC users to continue use at 12 months (86% versus 55%) and at 24 months (77% versus 41%).^{5,19} Satisfaction rates in this study were similarly high in LARC users and mirrored continuation rates.^{5,19}

Apart from any potential costs associated with insertion or removal, LARCs are not associated with any ongoing costs and are therefore highly cost effective compared with oral contraceptives or injectable contraceptives.²⁰⁻²³

There are very few contraindications to the use of LARCs, with the majority of women being eligible for LARCs (including young, nulliparous women and those postpartum; see below).^{2,11-18,24,25} LARCs are also reversible, with women rapidly returning to their normal fertility after removal.^{9,10}

In recognition of these benefits, numerous national and international consensus statements/guidelines (including those of the World Health Organization,²⁴ and the Royal Australian and New Zealand College of Obstetricians and Gynaecologists [RANZCOG]²⁵) support LARCs as a first-line option for women of all ages and parity, including young nulliparous women.^{2,14-18,24,25}



LARCs in New Zealand

Consensus statements/guidelines emphasise the positive impact LARCs have on rates of unintended pregnancies, repeat terminations and teenage pregnancies.^{2, 7, 26, 27} In New Zealand, the estimated prevalence of the levonorgestrel-implant increased steadily from 3.77 per 1000 women in 2010 to 17.25 per 1000 women in 2014.²⁷ The estimated prevalence of the levonorgestrel intrauterine system (IUS) also increased from 2.48 per 1000 women to 43.71 per 1000 women over the same time (**Figure 1**).²⁷ By contrast, the estimated prevalence of the copper IUD fluctuated, and there was a corresponding decrease in the use of short-acting contraceptive methods.²⁷ A significant association was demonstrated between the use of the two LARCs that were publicly funded at the time (the levonorgestrel implant and a copper IUD) and the declining abortion rates ($p < 0.01$).²⁷

Since 1st November, 2019, LARCs available in New Zealand and funded by PHARMAC now include two levonorgestrel-releasing IUSs (Mirena® and Jaydess®),^{11, 12, 28} the copper IUD (Choice Load 375; Choice TT380),²⁹ and the subcutaneous levonorgestrel implant (Jadelle®).¹³ Although insertion costs still apply in primary care, subsidies may be available depending on the district health board or primary health organisations.⁴ Local Family Planning or Sexual Health Clinic may also offer free, or lower cost, contraception services.

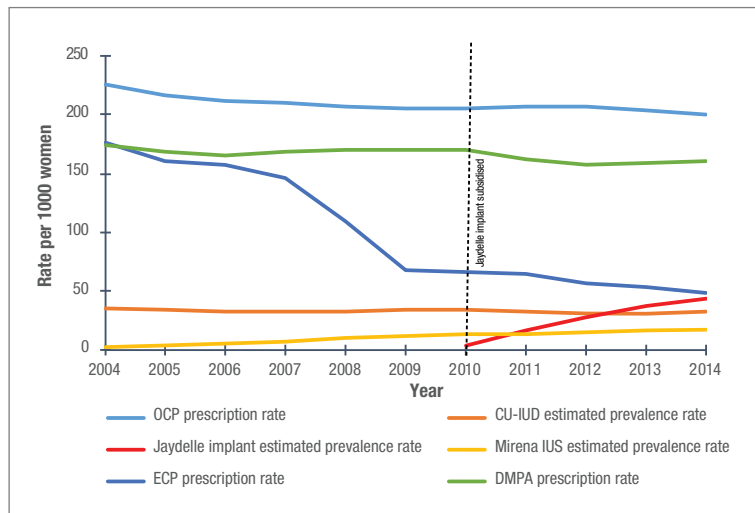


Figure 1. Estimated prevalence rates (per 1000 women) of long-acting reversible contraceptive methods and prescription rates (per 1000 women) for short-acting contraceptive methods in New Zealand from 2004 to 2014.

CU-IUD, copper intrauterine device; DMPA, depot medroxyprogesterone acetate; ECP, emergency contraceptive pill; LNG implant, levonorgestrel implant; LNG-IUS, levonorgestrel intrauterine system; OCP, oral contraceptive pill. Figure obtained from Whitley et al. J Womens Health (Larchmt). 2020; 29:21-8.

Patient-centred contraceptive counselling

Evidence-based patient counselling and education on LARC methods must occur so that misperceptions around the use of LARCs are dispelled and patients are fully informed when making contraceptive decisions.²⁰ Advice and information provided about LARCs must be patient focused, and women should be provided with the method of contraception that is most acceptable to them, unless it is contraindicated.²⁰ Women considering LARC methods should receive detailed information – both verbal and written – that will enable them to choose a method and use it effectively. Information should outline the method's contraceptive efficacy, duration of use, risks and possible side effects, non-contraceptive benefits, the procedure for initiation and removal/discontinuation, and when to seek help while using the method.

Training clinicians in evidence-based contraceptive counselling and providing women with this information increases the use of LARCs, as evidenced by outcomes from the CHOICE Project study and the ACCORd study.^{5, 6, 30}

The US CHOICE Project provided women with standardised information about, and access to, LARCs free of charge within reproductive health and family planning clinics; the women were then free to choose their contraceptive method.⁵ With the barriers of cost, knowledge, and access removed, 75% of the women chose a LARC method (46% selected the Mirena®, 12% selected the copper IUD, and 17% selected a subdermal implant) compared with an estimated 5% using LARCs before the study started.⁵ More women were satisfied with the LARC method of contraception than a non-LARC method at 12-months (84% vs 53%).⁶

Similarly, the randomised, Australian Contraceptive ChOice pROject (ACCORd) found that training family physicians in effectiveness-based contraception counselling and providing rapid access to LARC insertion clinics increased LARC use.³⁰ Significantly more women in an intervention group (who received structured contraceptive counselling from intervention-trained family physicians) than in a control group (who received the usual contraceptive care from their family physician) had a LARC inserted at 4 weeks (19.3% vs 12.9%; $p = 0.033$), at 6 months (44.4% vs 29.3%, $p = 0.001$), and at 12 months (46.6% vs 32.8%; $p = 0.0015$). The levonorgestrel IUS was the most commonly chosen LARC in the intervention group.

In New Zealand, patients can access information about LARCs from:

- Family Planning: www.familyplanning.org.nz
- Local general practitioner (GP): www.healthpoint.co.nz
- Health Navigator: <https://www.healthnavigator.org.nz>
- Healthinfo: <https://www.healthinfo.org.nz/patientinfo/Long%20Acting%20Contraceptives.pdf>

Intrauterine contraception device

Two basic types of IUDs are available in New Zealand; the non-hormonal copper IUD and the levonorgestrel IUS.

Levonorgestrel IUS

Two levonorgestrel IUSs (**Table 2**) are fully subsidised without restriction in New Zealand.²⁸ These are:

- a levonorgestrel 52 mg device (Mirena®) which is indicated for contraception for five years.¹¹ In addition, this intrauterine system is also indicated and approved in New Zealand for:
 - 1) the treatment of idiopathic menorrhagia provided there is no underlying pathology; and
 - 2) the prevention of endometrial hyperplasia during oestrogen replacement therapy;
- a levonorgestrel 13.5 mg device (Jaydess®) which is indicated for contraception for up to three years.¹²

The narrower insertion tube and smaller device size of Jaydess® compared with Mirena® (**Table 2**) may be a consideration for women who have not had a vaginal birth or who have a smaller endometrial cavity.^{11, 12, 31} Both devices have a reservoir on their stem which slowly releases levonorgestrel directly to the endometrium.³² Neither device should be used for emergency contraception.

Mechanism of action: Both Mirena® and Jaydess® primarily work by thickening the cervical mucus which prevents sperm from traveling up into the uterus.³³ In addition, local progestogenic effects within the uterine cavity cause decidualisation and atrophy of the endometrium, providing a decrease in menstrual flow.³⁴



Efficacy: Both Mirena® and Jaydess® provide similarly effective contraception.^{11,12,32} When inserted according to the manufacturer's insertion instructions, Mirena® has a failure rate of approximately 0.2% at 1 year and a cumulative failure rate of approximately 0.7% at 5 years;¹¹ Jaydess® has a failure rate of approximately 0.4% at 1 year and a cumulative failure rate of approximately 0.9% at 3 years.¹²

Side effects: Common side effects associated with either Jaydess® or Mirena® are shown in **Table 2**. Hormone-related side effects, such as breast tenderness and mood changes, associated with these IUSs have been shown to be no different from those associated with the use of a copper IUD.³⁵

In the first few months of use of either device, the initial bleeding pattern may include spotting, shorter or longer periods or irregular bleeding.^{11, 12} However, the number of bleeding days should decrease over time. Jaydess® is less likely to cause amenorrhoea than Mirena®.^{11, 12, 32}

Details relating to the risk of perforations and cervical shock associated with IUDs/IUSs are outlined below.

World Health Organization data suggest there is a small increased risk of pelvic infection (1.6 cases per 1000 woman-years of use) in the first 20 days after insertion, often relating to asymptomatic and unrecognised sexually transmitted infections (STIs).² After the first 20 days, the rate of pelvic inflammatory disease was similar in users of an IUD to that expected in the general population not using an IUD.²

Non-contraceptive benefits: Both Mirena® and Jaydess® reduce menstrual bleeding; however, the extent of reduction is greater in patients fitted with Mirena®.¹¹ In New Zealand, only Mirena® is indicated for the treatment of heavy menstrual bleeding.¹¹ See section on "Women with heavy bleeding" below. In addition, Mirena® is indicated for the prevention of endometrial hyperplasia during oestrogen replacement therapy.¹¹

Patient screening: Before insertion, the woman must be informed of the efficacy, risks and side effects of the Mirena® or Jaydess®.^{2,4,11,12} These IUS do not protect against STIs, and all women should be advised that additional barrier methods of contraception should be used if they are at risk of STIs.

A careful clinical history and physical examination are essential to identify any contraindications to their use prior to insertion.^{2, 4} There are few contraindications to IUS use.^{11, 12} The United Kingdom Medical Eligibility Criteria for Contraceptive use (UKMEC) is a useful and easily accessible guide which outlines eligibility criteria for the use of IUSs.³⁷

Insertion: Mirena® and Jaydess® should only be inserted by physicians/healthcare professionals who are experienced in inserting IUDs and/or have undergone training relating to the insertion procedure.^{11,12}

IUSs can be inserted at any time in the menstrual cycle if there is reasonable certainty that the woman is not pregnant.^{11, 12, 38} Immediate contraceptive cover is given if the IUS is inserted within seven days of the onset of menstruation. At other times in the cycle, additional contraception will be needed for seven days post insertion.³⁸ Either of these devices can be replaced by a new intrauterine system at any time in the cycle. Mirena®/Jaydess® can also be inserted immediately after a first trimester abortion.³⁸ The IUS can also be inserted immediately post delivery, or at 6 weeks.³⁹

Table 2. Comparison of Jaydess® and Mirena®^{11, 12}

	Jaydess® ¹²	Mirena® ¹¹
Indication	Contraception	Contraception Idiopathic menorrhagia provided there is no underlying pathology Prevention of endometrial hyperplasia
Total levonorgestrel in reservoir	13.5 mg	52 mg
Estimated mean dissolution rate of levonorgestrel	6 µg/24 hours over 3 years	15 µg/24 hours over 5 years
Approved duration of use for contraception	3 years	5 years
Dimensions of T-frame	28 x 30 mm	32 x 32 mm
Insertor tube width	3.8 mm	4.4 mm
Silver ring visualised on ultrasound	Yes	No
Colour of removal threads	Brown	Brown
Failure at 1 year	0.4%	0.2%
Rate of amenorrhoea in women of reproductive age at the end of 1 year	6%	16%
Adverse events	A systematic review found that hormone-related side effects were no different to those associated with a copper IUD. ³⁵	A systematic review found that hormone-related side effects were no different to those associated with a copper IUD. ³⁵
Additional benefits	Reduces heavy menstrual bleeding, but not approved for this indication	Reduces heavy menstrual bleeding, and is approved for this indication



Copper IUD

Copper IUDs available and fully funded in New Zealand are:

- Choice Load 375
- Choice TT380 Standard and Short

Mechanism of action: The copper IUD prevents fertilisation through a cytotoxic inflammatory reaction that is spermicidal.⁴⁰ In addition, its endometrial inflammatory effect prevents implantation should fertilisation occur.⁴¹

Indications: Licensed indications for copper IUDs are for ongoing contraception as well as emergency contraception provided it is inserted into the uterine cavity after unprotected intercourse up to 5 days after the estimated date of ovulation (day 19 in a 28 day cycle; day 21 in a 30 day cycle). The copper IUD may then either be removed after the next period or used as ongoing contraception.^{29, 42} Copper IUDs can be used in clinical scenarios where the use of hormonal contraceptives is not recommended, such as in women with previous breast cancer⁴

Efficacy: Copper IUDs are highly effective, with an estimated failure rate with typical use of <1% after 1 year of use.³

Duration of use: Copper IUDs are long acting, and effective for up to 10 years depending on the device.⁴ If inserted over the age of 40 years, they may be left *in situ* until the menopause.⁴²

Side effects: Although copper IUDs typically do not change menstrual frequency, currently available products can increase menstrual flow and cramping-type abdominal pain.^{4, 41-44} Bleeding and cramping typically decrease over the first six months of use, and most women report being satisfied with this contraceptive method.^{4, 43, 44}

See comments in later sections regarding risk of perforations with IUDs.

Insertion: These devices should only be inserted by physicians/healthcare professionals who are experienced in inserting copper IUDs and/or have undergone training relating to the insertion procedure of the devices.²⁹

The copper IUD can be inserted at any time in menstrual cycle if there is reasonable certainty that the woman is not pregnant.³⁸ It is immediately effective. Copper IUDs can be inserted immediately (within 10 minutes) post-abortion, or vaginal delivery.³⁹

Management of problems associated with IUDs (including levonorgestrel IUSs)

Perforation

Uterine perforation is a rare risk associated with IUD use.^{45, 46} Perforation or a penetration of the uterine corpus or cervix occurs, most often during insertion of an IUD, although it may not be detected until sometime later.^{11, 12}

In the European Active Surveillance Study for Intrauterine Devices study involving 61,448 women who were new users of levonorgestrel-releasing IUSs and copper-IUDs, an analysis at 12 months found the overall perforation rate was 1.4 per 1000 insertions for users of levonorgestrel-releasing IUSs and 1.1 per 1000 insertions for copper IUD users.⁴⁶ The strongest risk factors for uterine perforation were breastfeeding at time of insertion and a time since last delivery of less than 36 weeks, with no differences between women using levonorgestrel-releasing IUSs or copper IUDs.⁴⁶ Patients of more experienced clinicians were less likely to suffer perforation, regardless of IUD type.⁴⁶

Excessive pain or bleeding during insertion, or lost strings may be indicative of a perforation. In the event of a perforation, an ultrasound or X-ray is typically performed to determine the degree of perforation or to locate the device, which should be removed as soon as possible.^{4, 47}

The perforation usually heals without complications, and a further attempt at insertion can be made no less than 4 weeks later.⁴²

Vasovagal collapse/cervical shock

Cervical stimulation during insertion of IUDs can rarely cause a vasovagal reaction, bradycardia and other arrhythmias.³⁸ In healthy women, vasovagal incidents usually resolve with simple resuscitation measures; rarely, bradycardia persists and treatment with intravenous or intramuscular atropine is required.³⁸

Expulsions

Partial or complete expulsions of IUDs may occur, with the expulsion rates for Mirena® and Jaydess® being similar to those of other IUDs.^{11, 12, 38} Partially expelled IUDs should be removed and a new IUD inserted, provided pregnancy has been excluded and no other contraindications exist.^{11, 12}

Resources for healthcare professionals for IUDs

- The MOH have contracted Family Planning to provide Contraceptive Counselling and LARC insertions and removals for all eligible healthcare professionals.⁴⁹ <https://www.familyplanning.org.nz/courses>
- The DHBs have put forward the names of trainees to Family Planning <https://www.familyplanning.org.nz/media/304379/national-contraception-training-service-fagsdocx.pdf> https://www.familyplanning.org.nz/media/304401/family-planning-national-contraception-training-services-matrix_2020.pdf
- A continuing professional development online ecourse on IUDs is available from the University of [Auckland's Goodfellow Unit](#).

EXPERT COMMENT

IUDs/IUSs provide very effective contraception, and for women not wishing a hormonal method, the copper IUD is an excellent choice. Ensuring that a woman is not pregnant is important before insertion takes place. The Faculty of Sexual and Reproductive Healthcare (FSRH) of the Royal College of Obstetricians and Gynaecologists offers a useful table for advice. Women should be taught to check for the strings of their device and advised to see a health professional if these seem to be longer or not felt, or if the plastic stem is palpable.

Criteria for excluding pregnancy (adapted from UK Selected Practice Recommendations for Contraceptive Use)⁴⁸

Health professionals can be 'reasonably certain' that a woman is not currently pregnant if any one or more of the following criteria are met and there are no symptoms or signs of pregnancy:

- She has not had intercourse since last normal menses
- She has been correctly and consistently using a reliable method of contraception including condoms)
- She is within the first 7 days of the onset of a normal menstrual period
- She is not breastfeeding and less than 4 weeks from giving birth
- She is fully or nearly fully breastfeeding, amenorrhoeic, and less than 6 months' postpartum
- She is within the first 7 days post-abortion or miscarriage
- A negative pregnancy test, if available, adds weight to the exclusion of pregnancy, but only if ≥ 3 weeks since the last episode of unprotected sexual intercourse



Levonorgestrel implants

The subcutaneous levonorgestrel implant (Jadelle®) is fully funded for use as a contraceptive method for long-term use (up to 5 years) in New Zealand.¹³

Jadelle® consists of two implants which are inserted subdermally.^{13, 50} Each implant contains 75 mg levonorgestrel. The release rate of levonorgestrel is about 100 µg/day at one month after insertion, declining to about 40 µg/day within one year, to about 30 µg/day within three years and to about 25 µg/day within five years.⁵¹

Mechanism of action: A levonorgestrel implant primarily prevents ovulation.^{13,52,53} In addition, it alters cervical mucus thus preventing passage of sperm into the uterus.

Effectiveness: Jadelle® provides very effective contraception, with an estimated failure rate with typical use of <0.05% within the first year.³ Satisfaction with the levonorgestrel implants is generally high.⁴⁴

Patient screening: A Jadelle® implant can be inserted any time as long as the woman is not pregnant.¹³ A complete medical and family history should be taken. The most recent UKMEC should be referred to when assessing a woman's eligibility for any contraceptive method including the progestogen-only implant.¹⁸

Contraindications to use of Jadelle® include: known or suspected pregnancy, active venous thromboembolic disorder, presence or history of severe hepatic disease with liver function values above normal, presence or history of liver tumours (benign or malignant), known or suspected sex hormone-dependent malignancies, undiagnosed vaginal bleeding.¹³

Insertion and removal: Jadelle® implants are about 43 mm in length and 2.5 mm in diameter.¹³ Jadelle® implants are inserted under local anaesthesia in a subdermal position, just beneath the skin, in a narrow V shape on the inside of the upper non-dominant arm. A disposable, sterile trocar should be used, and the implants introduced one at a time.¹³ Training is required for the insertion and removal procedures, which should preferably be done by a healthcare professional.^{13, 52}

Before insertion of Jadelle®, the woman must be informed of its associated efficacy, risks, side effects and bleeding pattern changes.¹³ This discussion should include the information that a small proportion of women (1.5%) experienced adverse effects when Jadelle® is removed, including multiple or long incisions, pain, difficult removals and/or the requirement for additional visits. These problems typically occur when the implant has been inserted deeper than the advised subdermal placement.

In women who have not used hormonal contraception in the past month, Jadelle® should be inserted within 7 days from the onset of menstrual bleeding.¹³ If the implants are inserted at any other time, pregnancy must be reliably excluded before insertion and an additional non-hormonal contraceptive method used for at least 7 days after the insertion. The ideal time for inserting a levonorgestrel implant in women currently using combined oral contraceptive is on the day after the last active tablet. The FSRHC also provides advice for women starting the progestogen-only implant.⁵²

Jadelle® implants may be removed at any time of the menstrual cycle for medical or personal reasons, but they must be removed five years from insertion at the latest. Return to fertility is immediate and another contraceptive method should be used if pregnancy is not planned.¹³

Adverse events: Jadelle® implants affect the menstrual bleeding pattern in most women, with irregular, prolonged and intermenstrual bleeding, spotting and amenorrhoea being reported.¹³ In general, patterns of bleeding became more stable with increased time.^{13, 54} If bleeding is persistent or problematic, pharmacological management may be required. A combined oral contraceptive is usually the first-line treatment to reduce uncontrolled bleeding in patients using a levonorgestrel implant.⁴

A New Zealand study reported that 18% of women who had a Jadelle® implant inserted in a New Zealand Family Planning Clinic had it removed within 1 year of insertion.⁵⁴ Similar rates have been reported in other studies in other countries with levonorgestrel implants.^{3, 55, 56} The commonest reason for removal was bleeding.⁵⁴ In women who had a Jadelle® implant, 34% reported regular period-like bleeding, 27% had irregular bleeding, 22% had amenorrhoea, and the rest of the women reported bleeding patterns such as heavy bleeding or bleeding every two weeks.⁵⁴

The FSRH advise that although some women do report changes in weight, mood, headache and libido when using the progestogen-only implant, there is no evidence of a causal association.⁵² There is no requirement of routine follow-up of the woman with a levonorgestrel implant, but women should be encouraged to return at any time to discuss problems or change their contraceptive method.⁵² Women should be advised to return if: they cannot feel their implant or if it appears to have changed shape; they notice any skin changes or pain around the site of the implant; they become pregnant; or they develop any condition that may contraindicate continuation of the method.⁵²

Expulsion of implant: Expulsion of an implant may occur before healing of the incision has healed, if the implant was improperly inserted (e.g. very near the skin surface or too close to the incision), or if the insertion site is infected.¹³ The expelled implant should be replaced with a new, sterile implant.

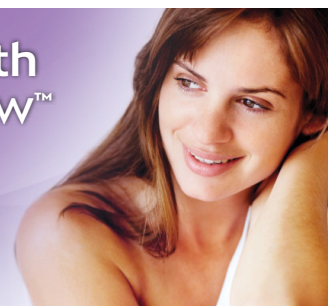
Concomitant medication: Levonorgestrel implants are not a suitable contraceptive method for women using enzyme-inducing medication.^{4, 13, 52} The effectiveness of levonorgestrel implants is reduced when women are taking medicines that induce microsomal enzymes (e.g. phenytoin, barbiturates, primidone, carbamazepine, rifampicin and efavirenz).^{4, 13, 52}

EXPERT COMMENT

The Jadelle® implant is a very effective contraceptive and has the added benefit of relieving period pain. The FSRH advises that there is no direct evidence that supports earlier replacement for women with high BMI.⁵² Women should be advised to seek help early if they have troublesome bleeding and, as long as there are no contraindications, they can be offered the combined pill in addition to the implant for a few months. It was previously recommended that the implant insertion site should be in the groove between the biceps and the triceps muscles. However, to avoid the large blood vessels and nerves that lie deeper in the connective tissue between these muscles, the current advice is to insert the implant over the biceps 8–10 cm (3–4 inches) above the medial epicondyle of the humerus. Subdermal placement is very important. If an implant is inserted deeper into muscle, it can then move out of the area. Implants that are not palpable at time of removal need to be referred to an interventional radiologist for removal under ultrasound scan guidance. Accident Compensation Corporation can be approached to pay for this removal.

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LARCs in specific populations

Young and/or nulliparous women

Use of IUDs should not be restricted based on parity or age alone, according to various consensus statements and guidelines.^{14-16, 18} In particular, major medical governance bodies have issued statements affirming the safety and appropriateness of offering LARCs to adolescents and youth, who are at often at high-risk for early and/or unintended pregnancy.^{2, 14-18, 24, 25}

Despite a rapid reduction over recent years, New Zealand still has a high rate of teenage pregnancy.⁵⁷ While the increased availability of LARCs is thought to have a role in this decline,^{27, 58} misconceptions about the risks and difficulties associated with LARC use by health professionals may continue to present a barrier.^{58, 59}

Despite concerns about the difficulty of inserting IUDs in young or nulliparous women, a study involving young females aged 13-24 years (59% of whom were nulliparous) indicated that the device was inserted successfully at the first attempt in 96.2%, with no perforations detected within the first 6 months.⁶⁰

Data from the CHOICE project indicates that continuation rates are high for nulliparous and adolescents who use LARCs, indicating a high level of satisfaction for this form of contraception.³⁷

Awareness and knowledge of LARCs among young people also appears to be low.^{61, 62} It is therefore vital that comprehensive information and counselling is specifically directed towards the needs and concerns of young and/or nulliparous women to enable them to make an informed contraceptive choice.⁶³ Given the effectiveness of LARCs, they must be included in the recommended range of options available when informing and counseling this patient population.^{15, 25}

Women with heavy bleeding

International guidelines recommend a levonorgestrel-releasing IUS as a first-line option for eligible women with heavy bleeding.^{17, 64-66}

Both Mirena® and Jaydess® reduce menstrual bleeding; however, the extent of reduction is greater in patients fitted with Mirena®.¹¹ In New Zealand, only Mirena® is indicated for the treatment of heavy bleeding.¹¹ In women who have heavy menstrual bleeding with no underlying cause, Mirena® reduces heavy bleeding by 71-95% at the end of six months.¹¹

A copper IUD may initially result in heavier and more painful menstrual bleeding.^{4, 41-44} While this typically improves after the first three months, a copper IUD may not be the ideal contraceptive in women who already have heavy, painful menstrual bleeding.⁴

Women with obesity

Obesity (body mass index [BMI] categories of ≥ 30 – 34 kg/m² and ≥ 35 kg/m²) generally results in lower plasma concentration exposures of various contraceptive drugs when given as standard doses by all common routes of administration.⁶⁷ However, since mechanisms of action of IUDs are based on local effects and do not rely on systemic drug levels, a woman's weight would not be expected to affect contraceptive effectiveness of IUDs.⁶⁸⁻⁷¹

Studies have not reported any evidence of impaired contraceptive effectiveness in IUD users with obesity, either with the copper IUD or the levonorgestrel-releasing IUSs.⁷¹ Consequently, for women with obesity without coexistent medical conditions, evidence-based guidelines do not place any restrictions on the use of IUDs in this patient population.^{18, 70} In particular, the UKMEC assign both copper IUDs and levonorgestrel-releasing IUSs a category 1 classification (i.e. no restriction to their use) in women with a BMI ≥ 30 kg/m² (Table 3).¹⁸

There has been some concern regarding the efficacy of progestogen-only implants in heavier women.⁵² However, there is considerable variation in serum levonorgestrel concentrations and in individual response, and so serum concentrations alone are not predictive of the risk of pregnancy in an individual woman,^{13, 70, 72} with studies indicating that obesity does not impact the efficacy of progestogen-only implants.⁷² According to the evidence-based UKMEC (Table 3), obesity alone does not restrict the use of a progestogen-only implant.¹⁸

Women with multiple cardiovascular risk factors/ cardiovascular disease

The risks associated with pregnancy in women with multiple cardiovascular risk factors (e.g. smoking, diabetes, hypertension, obesity and dyslipidaemias) or with cardiovascular disease vary widely and depend on the woman's cardiac diagnosis and her individual risk factors.⁷³⁻⁷⁵ Contraception for this group of women needs to be patient-focused and take into consideration the risk factors of the individual patient.⁷³

UKMEC classifications for women with multiple cardiovascular risk factors are shown in Table 3.¹⁸ In particular, copper IUDs can be used in women with higher cardiovascular risk and the advantages of levonorgestrel IUSs or progestogen-only implants generally outweigh their theoretical or proven risks.^{4, 18, 76, 77}

After pregnancy/abortion

International guidelines recommend that services providing care to pregnant women should discuss all appropriate methods of contraception, including of LARCs, to women before they are discharged from the service.^{17, 78, 79} Sexual activity and fertility may return quickly after childbirth/abortion, and it is important that effective methods of contraception are used.

Emergency contraception

Two methods of emergency contraception are licensed for use in New Zealand; oral levonorgestrel 1.5 mg (Postinor®)⁸⁰ and the copper IUD.⁴² The copper IUD is the more effective method of emergency contraception.^{42, 81, 82} Copper IUDs have the added advantage of providing ongoing contraception. When used as emergency contraception, the copper IUD prevents implantation.⁴² Neither Mirena® nor Jaydess® can be used as an emergency contraceptive.^{11, 12}

EXPERT COMMENTARY

There are few contraindications for LARC use and the FSRH UKMEC provides easily accessible advice regarding the suitability of LARCs for women with various medical conditions.^{18, 73, 78} The FSRH guidelines advise that contraceptive counselling should be made available to women in the antenatal period to enable them to choose the method they wish to use after childbirth. Intrauterine contraception and progestogen-only implants can be inserted immediately after delivery, and maternity services should ensure that there are sufficient numbers of staff able to provide these forms of contraception so that women can initiate them immediately after childbirth.

For women who are breastfeeding, progestogen-only methods have no adverse effects on lactation, infant growth or development.⁷⁸

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Table 3. United Kingdom medical eligibility criteria in specific patient populations¹⁸

	Copper intrauterine devices	Levonorgestrel intrauterine system	Progestogen -only implants	Combined hormonal contraception*
Women with obesity				
BMI ≥30–34 kg/m ²	1	1	1	2
BMI ≥35 kg/m ²	1	1	1	3
Multiple risk factors for cardiovascular disease (such as smoking, diabetes, hypertension, obesity and dyslipidaemias)				
	1	2	2	3
Venous thromboembolism (VTE)**				
History of VTE	1	2	2	4
Current VTE (on anticoagulants)	1	2	2	4
Smoking				
Age <35 years				
Age <35 years	1	1	1	2
Age ≥35 years				
<15 cigarettes/day	1	1	1	3
≥15 cigarettes/day	1	1	1	4
Stopped smoking <1 year	1	1	1	3
Stopped smoking ≥1 year	1	1	1	2

1=no restriction to use;
2=advantages generally outweigh the theoretical or proven risks;
3=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, since use of the method is not usually recommended unless other more appropriate methods are not available or not acceptable;
4=represents an unacceptable health risk if used.
* includes combined oral contraception, transdermal patch and vaginal rings.
** VTE includes deep vein thrombosis and pulmonary embolism of any aetiology.

EXPERT'S FINAL COMMENTS

Two barriers to LARC use have been lack of training for primary health care practitioners and the ability to deliver a same day service for women. The Family Planning LARC training, which will commence later this year, should help address the first issue. Providing a LARC for women the same day as requested avoids loss to follow up and the risk of unintended pregnancy, as does provision immediately post abortion and delivery.

STI screening is not considered necessary except for those women at high risk. In addition, LARCs can be inserted at any time in the menstrual cycle as long as pregnancy can be reasonably excluded. The copper IUD is the most effective post coital contraceptive and needs to be more widely considered for this purpose.

TAKE HOME MESSAGES

- Appropriate contraceptive options vary depending on the specific needs, preferences and co-morbidities of each patient.
- LARCs may be recommended as a first-line choice for women of all ages, including adolescents.
- There are few contraindications for LARC use.
- Mirena® should be considered above other contraceptive methods for women with heavy menstrual bleeding.
- The narrower insertion tube and smaller device size of Jaydess® may be a consideration for women who have not had a vaginal birth or who have a smaller endometrial cavity.
- The FSRH UKMEC provides easily accessible advice regarding the suitability of LARCs for women with various medical conditions,
- Contraceptive education and counselling are important to ensure maximum persistence with the chosen contraceptive method.

Helpful websites regarding LARC use are:

- Faculty of Sexual and Reproductive Healthcare. UK medical eligibility criteria for contraceptive use. 2019.
- Faculty of Sexual and Reproductive Healthcare. FSRH clinical guideline: intrauterine contraception. 2019. <https://www.fsrh.org/standards-and-guidance/documents/ceuguidanceintrauterinecontraception/>.
- Faculty of Sexual and Reproductive Healthcare. FSRH clinical guidance: progestogen-only implants. 2014. www.fsrh.org/standards-and-guidance/documents/cec-ceu-guidance-implants-feb-2014. Accessed April 21, 2020.
- Faculty of Sexual and Reproductive Healthcare. FSRH guideline: contraception after pregnancy 2017.



REFERENCES

- Committee on Practice Bulletins-Gynecology Long-Acting Reversible Contraception Work Group. Practice Bulletin No. 186: Long-acting reversible contraception: Implants and intrauterine devices. *Obstet Gynecol.* 2017;130:e251-e69.
- Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG). Long-acting reversible contraception. 2017. <http://www.ranzcog.edu.au/college-statements-guidelines.html>. Accessed April 17, 2020.
- Trussell J. Contraceptive failure in the United States. *Contraception.* 2011;83:397-404.
- Best Practice Advocacy Centre. Long-acting contraceptives: implants and IUDs. 2019. <https://bpac.org.nz/2019/contraception/docs/long-acting.pdf>. Accessed April 17, 2020.
- McNicholas C, Madden T, Secura G, et al. The contraceptive CHOICE project round up: what we did and what we learned. *Clin Obstet Gynecol.* 2014;57:635-43.
- Peipert JF, Zhao Q, Allsworth JE, et al. Continuation and satisfaction of reversible contraception. *Obstet Gynecol.* 2011;117:1105-13.
- Birgisson NE, Zhao Q, Secura GM, et al. Preventing unintended pregnancy: the contraceptive CHOICE project in review. *J Womens Health (Larchmt).* 2015;24:349-53.
- Hubacher D, Spector H, Monteith C, et al. Long-acting reversible contraceptive acceptability and unintended pregnancy among women presenting for short-acting methods: a randomized patient preference trial. *Am J Obstet Gynecol.* 2017;216:101-9.
- Hov GG, Skjeldstad FE, Hilstad T. Use of IUD and subsequent fertility-follow-up after participation in a randomized clinical trial. *Contraception.* 2007;75:88-92.
- Girum T, Wasie A. Return of fertility after discontinuation of contraception: a systematic review and meta-analysis. *Contracept Reprod Med.* 2018;3:9.
- Bayer New Zealand Limited. MIRENA® 52 mg intrauterine contraceptive device: Data sheet. 2018. <https://www.medsafe.govt.nz/profs/Datasheet/m/Mirenaus.pdf>. Accessed June 17, 2020.
- Bayer New Zealand Limited. JAYDESS® 13.5 mg intrauterine contraceptive device: Data sheet. 2018. <https://www.medsafe.govt.nz/profs/Datasheet/j/jaydessIVD.pdf>. Accessed June 17, 2020.
- Bayer New Zealand Limited. JADELLE® subcutaneous implants levonorgestrel: Data sheet 2019. <https://www.medsafe.govt.nz/profs/datasheet/j/Jadelleimplant.pdf>. Accessed June 17, 2020.
- Family Planning Alliance Australia. Long Acting Reversible Contraceptive (LARC): position statement. 2019. <http://familyplanningallianceaustralia.org.au/larc/>. Accessed Oct 18, 2019.
- Family Planning 2020. Global consensus statement for expanding contraceptive choice for adolescents and youth to include long-acting reversible contraception. 2019. <https://www.familyplanning2020.org/sites/default/files/Globa%20Consensus%20Statement%20-%20Expanding%20Contraceptive%20Choice.pdf>. Accessed Oct 18, 2019.
- Australian Healthcare and Hospitals Association. Consensus statement: reducing unintended pregnancy for Australian women through increased access to long-acting reversible contraceptive methods. 2017. https://ahha.asn.au/sites/default/files/docs/policy-issue/larc_consensus_statement.pdf. Accessed May 28, 2020.
- American College of Obstetricians and Gynecologists (ACOG). Practice Bulletin No. 186 Summary: Long-acting reversible contraception: implants and intrauterine devices. *Obstet Gynecol.* 2017;130:1173-5.
- Faculty of Sexual and Reproductive Healthcare. UK medical eligibility criteria for contraceptive use. 2019. <https://www.fsrh.org/standards-and-guidance/uk-medical-eligibility-criteria-for-contraceptive-use-ukmec/>. Accessed April 17, 2020.
- Secura GM, Allsworth JE, Madden T, et al. The Contraceptive CHOICE Project: reducing barriers to long-acting reversible contraception. *Am J Obstet Gynecol.* 2010;203:115 e1-7.
- National Institute for Health and Care Excellence. Long-acting reversible contraception: clinical guideline. 2019. www.nice.org.uk/guidance/cg30. Accessed April 17, 2020.
- Angelini K. A lower-cost option for intrauterine contraception. *Nurs Womens Health.* 2016;20:197-202.
- Matysina-Quinlan LA. Jaydess audit standards and benefits. *BMJ Sex Reprod Health.* 2019.
- Trussell J, Hassan F, Henry N, et al. Cost-effectiveness analysis of levonorgestrel-releasing intrauterine system (LNG-IUS) 13.5 mg in contraception. *Contraception.* 2014;89:451-9.
- World Health Organization. Reproductive health and research - medical eligibility criteria for contraceptive use. 4th ed. Geneva: WHO; 2009.
- Faculty of Sexual and Reproductive Healthcare. Contraceptive choices for young people. 2019. <https://www.fsrh.org/standards-and-guidance/documents/cec-ceu-guidance-young-people-mar-2019/>. Accessed April 30, 2020.
- Baldwin MK, Edelman AB. The effect of long-acting reversible contraception on rapid repeat pregnancy in adolescents: a review. *J Adolesc Health.* 2013;52:S47-53.
- Whitley CE, Rose SB, Sim D, et al. Association between women's use of long-acting reversible contraception and declining abortion rates in New Zealand. *J Womens Health (Larchmt).* 2020;29:21-8.
- PHARMAC. Decision to widen access to levonorgestrel intrauterine (LIUS) systems (Mirena and Jaydess). 2019. <https://www.pharmac.govt.nz/news/notification-2019-10-14-lius-mirena-jaydess/>. Accessed April 17, 2020.
- New Zealand Formulary. Copper intra-uterine device. 2020. https://nzfz.org.nz/nzfz_4233. Accessed April 17, 2020.
- MaZZa D, Watson CJ, Taft A, et al. Increasing long-acting reversible contraceptives: the Australian Contraceptive CHOICE pROject (ACCORD) cluster randomized trial. *Am J Obstet Gynecol.* 2020;222:S921.e1-S.e13.
- Gemzell-Danielsson K, Schellschmidt I, Apter D. A randomized, phase II study describing the efficacy, bleeding profile, and safety of two low-dose levonorgestrel-releasing intrauterine contraceptive systems and Mirena. *Fertil Steril.* 2012;97:616-22 e1-3.
- Faculty of Sexual and Reproductive Healthcare. New product review from the clinical effectiveness unit: Jaydess® levonorgestrel intrauterine system (LNG-IUS). 2014. <https://www.fsrh.org/standards-and-guidance/documents/new-product-review-levosert-intrauterine-delivery-system-april/>. Accessed April 20, 2020.
- Lewis RA, Taylor D, Nativio MF, et al. Effects of the levonorgestrel-releasing intrauterine system on cervical mucus quality and sperm penetrability. *Contraception.* 2010;82:491-6.
- Seeber B, Ziehr SC, Gschlieber A, et al. Quantitative levonorgestrel plasma level measurements in patients with regular and pro-longed use of the levonorgestrel-releasing intrauterine system. *Contraception.* 2012;86:345-9.
- French RS, Cowan FM, Mansour DJ, et al. Implantable contraceptives (subdermal implants and hormonally impregnated intrauterine systems) versus other forms of reversible contraceptives: two systematic reviews to assess relative effectiveness, acceptability, tolerability and cost-effectiveness. *Health Technol Assess.* 2000;4:i-vi, 1-107.
- PHARMAC. 2019. Decision to widen access to levonorgestrel intrauterine (LIUS) systems (Mirena and Jaydess). 2019. <https://www.pharmac.govt.nz/news/notification-2019-10-14-lius-mirena-jaydess/>. Accessed June 23, 2019.
- Abraham M, Zhao Q, Peipert JF. Young age, nulliparity, and continuation of long-acting reversible contraceptive methods. *Obstet Gynecol.* 2015;126:823-9.
- Faculty of Sexual and Reproductive Healthcare. FSRH clinical guideline: intrauterine contraception. 2019. <https://www.fsrh.org/standards-and-guidance/documents/ceuguidanceintrauterinecontraception>. Accessed April 29, 2020.
- Faculty of Sexual and Reproductive Healthcare. UKMEC - Summary table hormonal and intrauterine contraception. 2019. <https://www.fsrh.org/standards-and-guidance/documents/ukmec-2016-summary-sheets>. Accessed June 15, 2020.
- Holland MK, White IG. Heavy metals and human spermatozoa. III. The toxicity of copper ions for spermatozoa. *Contraception.* 1988;38:685-95.
- Hsia JK, Creinin MD. Intrauterine contraception. *Semin Reprod Med.* 2016;34:175-82.
- Goodfellow Unit. Intrauterine contraceptive devices. Auckland: University of Auckland; 2019.
- Sanders JN, Adkins DE, Kaur S, et al. Bleeding, cramping, and satisfaction among new copper IUD users: A prospective study. *PLoS One.* 2018;13:e0199724.
- Diedrich JT, Desai S, Zhao Q, et al. Association of short-term bleeding and cramping patterns with long-acting reversible contraceptive method satisfaction. *Am J Obstet Gynecol.* 2015;212:50.e1-8.
- Barnett C, Moehner S, Do Minh T, et al. Perforation risk and intra-uterine devices: results of the EURAS-IUD 5-year extension study. *Eur J Contracept Reprod Health Care.* 2017;22:424-8.
- Heinemann K, Reed S, Moehner S, et al. Risk of uterine perforation with levonorgestrel-releasing and copper intrauterine devices in the European Active Surveillance Study on Intrauterine Devices. *Contraception.* 2015;91:274-9.
- Kaislasuo J, Suhonen S, Gissler M, et al. Uterine perforation caused by intrauterine devices: clinical course and treatment. *Hum Reprod.* 2013;28:1546-51.
- Faculty of Sexual and Reproductive Healthcare. UK Selected Practice Recommendations for Contraceptive Use. 2002. <http://www.fsrh.org/pdfs/archive/SelectedPracticeRecommendations2002.pdf>. Accessed June 15, 2020.
- Planning F. IUD insertion training. 2020. <https://www.familyplanning.org.nz/courses/course?id=12>. Accessed June 15, 2020.
- Wan LS, Stiber A, Lam LY. The levonorgestrel two-rod implant for long-acting contraception: 10 years of clinical experience. *Obstet Gynecol.* 2003;102:24-6.
- Bayer New Zealand Limited. JADELLE® 75 mg: Data sheet. 2019.
- Faculty of Sexual and Reproductive Healthcare. FSRH clinical guidance: progestogen-only implants. 2014. www.fsrh.org/standards-and-guidance/documents/cec-ceu-guidance-implants-feb-2014. Accessed April 21, 2020.
- Croxatto HB. Mechanisms that explain the contraceptive action of progestin implants for women. *Contraception.* 2002;65:21-7.
- Roke C, Roberts H, Whitehead A. New Zealand women's experience during their first year of Jadelle® contraceptive implant. *J Prim Health Care.* 2016;8:13-9.
- Sivin I. Risks and benefits, advantages and disadvantages of levonorgestrel-releasing contraceptive implants. *Drug Saf.* 2003;26:303-35.
- O'Neil-Callahan M, Peipert JF, Zhao Q, et al. Twenty-four-month continuation of reversible contraception. *Obstet Gynecol.* 2013;122:1083-91.
- National Institute of Demographic and Economic Analysis. Current trends for teenage births in New Zealand. Hamilton: University of Waikato; 2015.
- Sandle M, Tuohy P. Everyone's talking Jadelle®: the experiences and attitudes of service providers regarding the use of the contraceptive implant, Jadelle in young people in New Zealand. *N Z Med J.* 2017;130:40-6.
- Black K, Lotke P, Buhling KJ, et al. A review of barriers and myths preventing the more widespread use of intrauterine contraception in nulliparous women. *Eur J Contracept Reprod Health Care.* 2012;17:340-50.
- Teal SB, Romer SE, Goldthwaite LM, et al. Insertion characteristics of intrauterine devices in adolescents and young women: success, ancillary measures, and complications. *Am J Obstet Gynecol.* 2015;213:515.e1-5.
- Ritter T, Dore A, McGeehan K. Contraceptive knowledge and attitudes among 14-24-year-olds in New South Wales, Australia. *Aust N Z J Public Health.* 2015;39:267-9.
- Bracken J, Graham CA. Young women's attitudes towards, and experiences of, long-acting reversible contraceptives. *Eur J Contracept Reprod Health Care.* 2014;19:276-84.
- Jaccard J, Levitz N. Counseling adolescents about contraception: towards the development of an evidence-based protocol for contraceptive counselors. *J Adolesc Health.* 2013;52:56-13.
- Australian Commission on Safety and Quality in Health Care. Heavy Menstrual Bleeding Clinical Care Standard. ACSQHC2017.
- National Institute for Health and Care Excellence. Heavy menstrual bleeding: assessment and management. 2018. www.nice.org.uk/guidance/ng88. Accessed April 23, 2020.
- Health Quality Ontario. Levonorgestrel-releasing intrauterine system (52 mg) for idiopathic heavy menstrual bleeding: A health technology assessment. *Ont Health Technol Assess Ser.* 2016;16:1-119.
- Jusko WJ. Clarification of contraceptive drug pharmacokinetics in obesity. *Contraception.* 2017;95:10-6.
- Merki-Feld GS, Skouby S, Serfaty D, et al. European society of contraception statement on contraception in obese women. *Eur J Contracept Reprod Health Care.* 2015;20:19-28.
- Lopez LM, Bernholm A, Chen M, et al. Hormonal contraceptives for contraception in overweight or obese women. *Cochrane Database Syst Rev.* 2016;CD008452.
- Faculty of Sexual and Reproductive Healthcare. Overweight, obesity and contraception England No. 28042132019.
- Gemzell-Danielsson K, Apter D, Hauck B, et al. The effect of age, parity and body mass index on the efficacy, safety, placement and user satisfaction associated with two low-dose levonorgestrel intrauterine contraceptive systems: subgroup analyses of data from a phase III trial. *PLoS One.* 2015;10:e0135309.
- Xu H, Wade JA, Peipert JF, et al. Contraceptive failure rates of etonogestrel subdermal implants in overweight and obese women. *Obstet Gynecol.* 2012;120:21-6.
- Faculty of Sexual and Reproductive Healthcare. Contraceptive choices for women with cardiac disease 2014. <https://www.fsrh.org/standards-and-guidance/documents/cec-ceu-guidance-contraceptive-choices-for-women-with-cardiac/>. Accessed April 30, 2020.
- Thorne S, MacGregor A, Nelson-Piercy C. Risks of contraception and pregnancy in heart disease. *Heart.* 2006;92:1520-5.
- Roos-Hesselink JW, Cornette J, Siwa K, et al. Contraception and cardiovascular disease. *Eur Heart J.* 2015;36:1728-34, 34a-34b.
- Practice Committee of the American Society for Reproductive Medicine. Combined hormonal contraception and the risk of venous thromboembolism: a guideline. *Fertil Steril.* 2017;107:43-51.
- Committee on Gynecologic Practice. ACOG Committee Opinion Number 540: Risk of venous thromboembolism among users of drospirenone-containing oral contraceptive pills. *Obstet Gynecol.* 2012;120:1239.
- Faculty of Sexual and Reproductive Healthcare. FSRH guideline: contraception after pregnancy 2017. <https://www.fsrh.org/news/new-fsrh-guideline-contraception-after-pregnancy/>. Accessed April 30, 2020.
- American College of Obstetricians and Gynecologists (ACOG). Committee Opinion No. 670: immediate postpartum long-acting reversible contraception. *Obstet Gynecol.* 2016;128:e32-e7.
- Bayer New Zealand Limited. POSTINOR-1: New Zealand data sheet. 2017. <https://www.medsafe.govt.nz/profs/datasheet/p/Postinor-1tab.pdf>. Accessed April 24, 2020.
- Faculty of Sexual and Reproductive Healthcare. FSRH guideline: emergency contraception 2017. <https://www.fsrh.org/standards-and-guidance/documents/cec-clinical-guidance-emergency-contraception-march-2017/>. Accessed April 30, 2020.
- Shen J, Che Y, Showell E, et al. Interventions for emergency contraception. *Cochrane Database Syst Rev.* 2017;8:CD001324.



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