Prescribing contraception is a core part of primary care practice. A patient’s co-morbidities and concurrent medicines can influence the balance of risks and benefits and therefore the choice of contraceptive. Key changes in guidelines in recent years include recommending long-acting contraceptive methods, such as the levonorgestrel implant or intrauterine contraceptive devices (IUDs) for use in all ages, and using “the pill” in a continuous regimen.
Contraception: which option for which patient?

Prescribing contraception is a core part of primary care practice. A patient’s co-morbidities and concurrent medicines can influence the balance of risks and benefits and therefore the choice of contraceptive. Key changes in guidelines in recent years include recommending long-acting contraceptive methods, such as the levonorgestrel implant or intrauterine contraceptive devices (IUDs), for use in all ages, and using “the pill” in a continuous regimen.

**KEY PRACTICE POINTS:**

- Appropriate contraceptive options vary depending on the specific needs, preferences and co-morbidities of each patient. A subsidised option is available for everyone.
- Long-acting reversible contraceptives (LARC) may be recommended as a first-line choice for people of all ages, including adolescents.
- Combined oral contraceptive regimens can be tailored: advise patients that withdrawal bleeds are not necessary and extended use is safe and effective.
- Clinicians should ensure that people of all ages recognise the need for condoms to protect against STIs, even when other forms of contraception are used.
- Contraception is needed until patients reach menopause or age 55 years.

This article is the first in a series on prescribing contraceptives in primary care. For further information on specific contraceptive methods, see the accompanying articles in this series:

- “Condoms: advising on the options”
- “Oral contraceptives: selecting a pill”
- “Depot medroxyprogesterone acetate injections: an intermediate option”
- “Long-acting contraceptives: implants and IUDs”

**Counselling patients on contraception: it’s better out in the open**

Patients may find discussing contraception and the prevention of sexually transmitted infections (STIs) a sensitive or awkward topic, as it touches on issues such as their sexuality and sexual practices, as well as relationship issues and their future plans.
for children. In addition, their views and behaviours can be influenced by social, family, religious or cultural factors. However, there is much to be gained and little to be lost when patients and healthcare providers have open discussions about contraception and prevention of STIs. The goal of counselling patients about contraception is to ensure they are using a safe, effective option which is the most appropriate for their clinical needs and preferences. Clinicians should be aware that transgender patients may still require contraception even when using gender affirming hormone treatment (see: “Contraception in transgender patients”).

For further information on discussing sex and contraception with younger people, see:

Evidence suggests people are interested in hearing more
The most commonly used form of contraception in New Zealand is the oral contraceptive pill. However, data from international surveys and focus groups in New Zealand show that people are eager to know more about the contraceptive options available to them, and that many would be interested in trying other options, such as long-acting contraceptives, if they had information about them.2, 3

A variety of contraceptive options are available
Methods of contraception available* in New Zealand include:
- Condoms; external and internal varieties – ensure that patients of all ages recognise the need for condoms to protect against STIs, even when other forms of contraception are used4
- Oral contraceptives; combined and progestogen-only formulations
- Long-acting reversible contraceptives (LARC); progestogen implants, copper and levonorgestrel (progestogen) intrauterine devices (IUDs)
- Depot medroxyprogesterone acetate (DMPA) injections†
- Sterilisation options; vasectomy or tubal ligation
- Emergency contraception
- Natural family planning

* Diaphragms and vaginal rings are no longer available on prescription in New Zealand
† Depot medroxyprogesterone acetate injections are no longer classified as a long-acting contraceptive as they are less effective than IUDs or implants and require patients to return for an injection every 12 weeks 1

Depending on co-morbidities, other prescribed medicines or recent pregnancy, some options may be inappropriate due to a high risk of adverse effects (Table 1).

Patients may base their preference for a contraceptive method on factors such as effectiveness (Table 2), adverse effects and risks, ease of use, future pregnancy plans, cost, or particular symptoms they wish to manage. For example, some people may want greater cycle control, relief from menstrual pain or heavy menstrual bleeding, while others may be concerned about age-related adverse effects, such as venous thromboembolism.

Contraception is needed until age 55 years or menopause
Patients can cease using contraceptives at age 55 years, as pregnancy is very rare beyond this age even if they continue menstruating.6 Some patients may discontinue contraceptives earlier if menopause has occurred.6 A clinical diagnosis of menopause can be made after one year of amenorrhea; contraception can be ceased at this time for patients aged over 50 years, but is recommended for an additional year in patients aged 40–50 years, i.e. for two years after the onset of amenorrhoea.6

What’s new?
- Long-acting contraceptive methods, including the levonorgestrel implant and IUDs, are the most effective form of contraception and are increasingly recommended as a first-line option for many patients; IUDs are not just for use after pregnancy
- The ideal method for using combined oral contraceptives is to take pills continuously, without a hormone-free interval. A withdrawal bleed is not medically necessary, and a continuous regimen reduces the chance of contraceptive failure (e.g. if pills are missed) and avoids the adverse effects associated with the hormone-free interval.
- Combined oral contraceptives can be started from six weeks post-partum even if breastfeeding; previous advice was to wait until six months post-partum

Increased use of long-acting contraceptives could help reduce disparities
Conventionally, IUDs were most commonly used by women who had completed their families and wished to have a long-term form of contraception. There was some resistance to the idea that an IUD could be an appropriate contraceptive option for younger women and those who had not yet given birth,
Table 1: Recommendations regarding the likely benefits and risks of different contraceptive options. Adapted from the World Health Organization, Centers for Disease Control and Prevention and Faculty of Sexual and Reproductive Healthcare \textsuperscript{4,14,15}

<table>
<thead>
<tr>
<th>Patient characteristics</th>
<th>Oral contraceptives</th>
<th>Depot medroxyprogesterone acetate injections (DMPA)</th>
<th>Levonorgestrel implant</th>
<th>IUDs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Combined oral contraceptives (COCs)</td>
<td>Progestogen-only oral contraceptives (POPs)</td>
<td>Levonorgestrel</td>
<td>Levonorgestrel</td>
</tr>
<tr>
<td>Younger (e.g. &lt; 18 years) or nulliparous</td>
<td></td>
<td></td>
<td>a</td>
<td></td>
</tr>
<tr>
<td>Aged ≥ 50 years or over \textsuperscript{4}</td>
<td>b</td>
<td></td>
<td>b</td>
<td></td>
</tr>
<tr>
<td>Taking hepatic-enzyme inducing medicines, e.g. some anticonvulsants</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At increased risk of venous thromboembolism (VTE)</td>
<td>c</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With, or at increased risk of, cerebro- or cardiovascular diseases</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td></td>
<td></td>
<td>d</td>
<td></td>
</tr>
<tr>
<td>Smoking in patients aged over 35 years</td>
<td>e</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valvular heart disease or atrial fibrillation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stroke or ischaemic heart disease</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vascular disease</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>With multiple cardiovascular risk factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With diabetes and complications, or diabetes for &gt; 20 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Migraine with aura</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-partum</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediately</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 4 weeks</td>
<td>g</td>
<td></td>
<td>f</td>
<td></td>
</tr>
<tr>
<td>4 - 6 weeks</td>
<td>g</td>
<td></td>
<td>f</td>
<td></td>
</tr>
<tr>
<td>&gt; 6 weeks</td>
<td>g</td>
<td></td>
<td>f</td>
<td></td>
</tr>
<tr>
<td>Following termination of pregnancy or spontaneous abortion</td>
<td></td>
<td></td>
<td></td>
<td>h</td>
</tr>
<tr>
<td>Current or previous breast cancer</td>
<td></td>
<td></td>
<td></td>
<td>i</td>
</tr>
</tbody>
</table>

- Benefits are likely to outweigh risks
- Risks may outweigh benefits for some patients, see footnotes for details
- Not recommended, risks are likely to outweigh benefits

\textsuperscript{a} Medroxyprogesterone acetate injections are associated with a decrease in bone mineral density; other contraceptive options should be considered first in patients aged <18 years.

\textsuperscript{b} Use in patients aged 50 years and over is not recommended due to an increased risk of venous thromboembolism (COC) or a decrease in bone mineral density (DMPA).

\textsuperscript{c} For example, personal history of VTE, or prolonged immobility due to surgery or disability.

\textsuperscript{d} Risks are likely to outweigh benefits for patients with poorly controlled hypertension, i.e. systolic blood pressure ≥ 160 mmHg or diastolic ≥ 100 mmHg.

\textsuperscript{e} Risk increases with age. Use is generally not recommended in people aged over 35 years who smoke, however, clinicians should consider the patient’s overall level of risk when considering the use of COCs in a patient who smokes, rather than relying on a strict age criterion.

\textsuperscript{f} IUDs can be safely inserted within 48 hours of delivery, otherwise insertion should be delayed until after four weeks post-partum.

\textsuperscript{g} COC may be considered from three weeks post-partum if not breastfeeding and no additional risk factors for VTE (e.g. caesarean section delivery, pre-eclampsia, haemorrhage, transfusion at delivery, immobility, BMI ≥ 30 kg/m\textsuperscript{2} or smoking).

\textsuperscript{h} IUDs can be inserted after a first or second trimester termination, but should not be inserted immediately after an abortion where sepsis has occurred.

\textsuperscript{i} Should not be used in patients with current breast cancer, but may be considered if cancer has been in remission for more than five years and non-hormonal contraceptive options are inappropriate.
Table 2: Effectiveness of different contraceptive methods and rates of continuation after one year. Adapted from the Faculty of Sexual and Reproductive Healthcare, United Kingdom¹⁶,¹⁷

<table>
<thead>
<tr>
<th>Number of pregnancies per 1,000 females of reproductive age after one year</th>
<th>Subsidy</th>
<th>For further information, see:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No contraception</strong></td>
<td>850</td>
<td></td>
</tr>
<tr>
<td><strong>Barrier and short-term options:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male condoms</td>
<td>20</td>
<td>130–180</td>
</tr>
<tr>
<td>Female condoms</td>
<td>50</td>
<td>210</td>
</tr>
<tr>
<td>Diaphragm†</td>
<td>60</td>
<td>120</td>
</tr>
<tr>
<td>Spermicide†</td>
<td>180</td>
<td>280</td>
</tr>
<tr>
<td><strong>Oral contraceptives:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combined oral contraceptive (COC)</td>
<td>3</td>
<td>90</td>
</tr>
<tr>
<td>Progestogen-only contraceptive (POP)</td>
<td>2</td>
<td>90</td>
</tr>
<tr>
<td><strong>Injectable options:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depot medroxyprogesterone acetate injections (DMPA)</td>
<td>2–6</td>
<td>60</td>
</tr>
<tr>
<td><strong>Long-acting reversible contraceptives:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Levonorgestrel implants</td>
<td>&lt; 1</td>
<td></td>
</tr>
<tr>
<td>Levonorgestrel IUD</td>
<td>2–6</td>
<td></td>
</tr>
<tr>
<td>Copper IUD</td>
<td>6–8</td>
<td></td>
</tr>
<tr>
<td><strong>Non-pharmacological options</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fertility awareness methods</td>
<td>50</td>
<td>240</td>
</tr>
<tr>
<td><strong>Permanent contraceptive methods:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tubal occlusion/ligation</td>
<td>5</td>
<td>**</td>
</tr>
<tr>
<td>Vasectomy</td>
<td>1–2</td>
<td>**</td>
</tr>
</tbody>
</table>

- Fully subsidised options available  
- SA = Special Authority approval required

* Perfect use refers to using the contraceptive exactly as recommended. Typical use is when contraception is not always used consistently or correctly, e.g. forgetting to take a dose of medicine, condom applied incorrectly.
† Diaphragms and spermicide have not been available on prescription in New Zealand for some time. Diaphragms may be available unsubsidised at some pharmacies. If patients already have a diaphragm they wish to keep using, support is available from Family Planning: www.familyplanning.org.nz/advice/contraception/diaphragms
‡ A levonorgestrel IUD is fully subsidised with Special Authority approval for patients with heavy menstrual bleeding; use as a contraceptive alone is unsubsidised
** Some patients may qualify for a tubal ligation or vasectomy performed in the public health system, depending on local eligibility criteria.
due to concerns such as ease of insertion. However, there is no clinical basis for this concern, and an IUD should be considered as an appropriate option for almost anyone. The levonorgestrel implant (inserted in the arm) has been funded in New Zealand since 2010, and is the most effective method of reversible contraception available (Table 2). Some clinicians may be less familiar with this method as they do not have experience in placing the implants, but the procedure can be easily learned.

Use of a long-acting reversible contraceptive (LARC) is associated with a much lower rate of unintended pregnancy, compared to shorter-acting methods such as oral contraceptives or DMPA injections. In New Zealand, rates of abortion have been declining since the mid-2000s and research suggests that this is due in part to an increased use of LARC.

Reductions have been particularly pronounced in females aged 15–19 years, however, rates of abortion are still highest amongst people of Māori ethnicity and females aged 20–29 years.

The additional appointment time and repeat visits, or visits to another provider, required for initiating a LARC can be a barrier to patients in terms of convenience and cost. Consider whether there are ways your practice could simplify the process for patients, e.g. by having a clinical staff member trained in insertion and removal techniques, and having a supply of LARC at the practice (available on PSO). If offering these services at your practice is not possible, patients can be referred to Family Planning or Sexual Health Clinics, if locally available; these services may offer contraception services at a lower cost or free. Some PHOs may also offer funding for sexual health or contraception-related consultations; enquire with your PHO.

* Appointments at Family Planning are free for people aged under 22 years

Funding to help cover the costs of initiating a LARC may be available for some patients from Work and Income New Zealand: www.workandincome.govt.nz/eligibility/health-and-disability/contraception.html

Withdrawal bleeds with combined oral contraceptives are not necessary

Combined oral contraceptive (COC) pills were first introduced in New Zealand in the 1960s. They were formulated to mimic the natural menstrual cycle, with three weeks of active hormone tablets followed by one week of placebo tablets at which time a withdrawal bleed usually occurs. However, there is no medical basis for this withdrawal bleed and COC users can be reassured that skipping the hormone-free interval is safe, and is in fact now recommended. Continuous use of hormone pills, rather than stopping and starting, may improve contraceptive effectiveness by reducing the likelihood of missing pills, as well as lessening the consequences of missed pills, e.g. compared with missing pills in the first week of a conventional regimen, thereby extending the hormone-free interval. In addition, bleeding-related adverse effects, such as headache, bloating and abdominal pain, can be avoided, which is likely to improve satisfaction and adherence with this method of contraception.

Any contraceptive can be started six weeks post-partum

If contraception is required after childbirth, any of the available options can be given from six weeks post-partum, including COCs; progestogen-only pills, injections or implants can be used prior to six weeks and IUDs can either be inserted immediately post-partum or after four weeks (Table 1).

It was previously recommended that COCs be avoided for the first six months post-partum if breastfeeding due to potential suppressive effects of ethinylestradiol on milk supply. While the data on COC use and breastfeeding are limited and conflicting, better quality studies investigating breastfeeding performance, i.e. duration, exclusivity and initiation of supplemental feeding, and infant growth, health and development have shown no adverse effects when COCs are started from six weeks post-partum, provided breastfeeding is well established and there are no concerns with the infant’s growth.

The lactational amenorrhoea method is an effective form of contraception if less than six months post-partum, amenorrhoeic and fully breastfeeding. This method should not be relied on if the frequency of breastfeeding decreases, e.g. night feeds stopped, supplemental foods started, if menstruation returns or if the patient is more than six months post-partum.

Selecting a contraceptive option

Tables 1 and 2 can be used to decide, together with the patient, which types of contraception may be the most appropriate for them; detailed information on each option is available in the accompanying articles in this series:

Natural family planning

The use of fertility awareness or withdrawal methods to prevent conception may be preferred by people who wish to avoid other methods of contraception for religious or personal reasons.19 When adhered to strictly these methods can have good efficacy rates. However, with typical use approximately one-quarter of people relying on these methods become pregnant within one year.14, 16

Fertility awareness methods rely on monitoring markers of fertility daily, including body temperature, changes in cervical secretions, changes in the cervix and timing of menstruation. Combining multiple markers is more effective than relying on a single marker.20 Monitoring needs to occur for a number of cycles before relying on the results. Learning the technique can be difficult and is more complicated if patients have irregular cycles.20

Key practice points for the use of fertility awareness methods include:20

- They should not be used in patients who are taking potentially teratogenic medicines
- They require a high level of patient engagement and in typical use have high failure rates
- Menstrual irregularities or recent use of hormonal contraception may make determining the fertile window difficult
- All patients wanting to use a fertility awareness method should be instructed in this method by an expert, such as an educator from Natural Fertility New Zealand: www.naturalfertility.co.nz
- Caution patients that smartphone apps which aim to assist users with fertility awareness may be unreliable and should not replace education from an expert


Emergency contraception

Emergency contraception should be considered for patients who have had unprotected sex:21

- If no contraceptive method is being used
- If contraceptive failure occurs, e.g. condom breakage
- If two or more active combined oral contraceptive pills have been missed in the first week following the hormone-free interval,* or more than eight pills have been missed at other times or in a continuous cycle22
- If a progestogen-only pill is missed and intercourse occurs <48 hours after restarting*
- If more than 14 weeks have passed since a DMPA injection
- In the seven-day period prior to expulsion of an IUD or discovering the threads of an IUD are missing

* Evidence suggests that oral emergency contraceptives are not effective if taken after ovulation has occurred or if taken more than 96 hours after unprotected intercourse

Two forms of fully subsidised emergency contraception are available in New Zealand (Table 3). The levonorgestrel tablet is slightly less effective than the copper IUD, however, it does not require an insertion procedure and may be more convenient for patients as it is available at pharmacies without a prescription.

<table>
<thead>
<tr>
<th>Emergency contraceptive</th>
<th>Pregnancy rate with correct use</th>
<th>To be used within</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levonorgestrel 1.5 mg tablet</td>
<td>1–3%</td>
<td>72 hours (3 days)*</td>
</tr>
<tr>
<td>Copper IUD</td>
<td>Less than 1%</td>
<td>120 hours (5 days) OR Up to 5 days after expected date of ovulation</td>
</tr>
</tbody>
</table>

* Evidence suggests that oral emergency contraceptives are not effective if taken after ovulation has occurred or if taken more than 96 hours after unprotected intercourse

The copper IUD should be considered as an option whenever emergency contraception is needed, as it is the most effective method of emergency contraception and effectiveness is not altered by BMI or the use of enzyme-inducing medicines.21 A copper IUD can be inserted either up to five days following unprotected intercourse or up to five days after the expected date of ovulation. The copper IUD can be left in place for ongoing contraception, or removed once pregnancy is excluded, e.g. at the next menstrual period.21

Levonorgestrel emergency contraception may be less effective in patients weighing over 70 kg or with a BMI greater than 26 kg/m², with rates of pregnancy of up to 5% observed in some, but not all, studies.23 For these patients, clinicians may consider prescribing two 1.5 mg tablets, however, this is an unapproved dose.21, 26 The effectiveness of levonorgestrel emergency contraception is also reduced in patients taking enzyme-inducing medicines.

After use of levonorgestrel emergency contraception, patients should expect a change in menstruation, typically
occurring earlier and heavier than expected. Other adverse effects include headache, nausea, dizziness and, less commonly vomiting. If vomiting does occur and it is within two hours of administration, a repeat dose or use of a copper IUD is recommended. There is limited evidence as to whether taking levonorgestrel emergency contraception with food, or prior administration of antiemetic medicines, can help reduce nausea. However, these approaches are widely recommended and may benefit some patients. Some evidence suggests that if levonorgestrel emergency contraception fails there may be a higher risk of ectopic pregnancy, however, this has not been consistently observed in studies and the absolute rate is very low.

**Sterilisation methods**

Discussion about sterilisation should cover issues such as life stage, future plans and relationship stability and ensure that both partners have an opportunity to express any questions or concerns. Information should be provided on other contraceptive options for the female partner that would offer a similar level of effectiveness, such as an implant or IUD; also consider if the patient has a history of menstrual difficulties that may reoccur when their current contraceptive is stopped, and menstruation resumes after sterilisation.

Sterilisation options include vasectomy and tubal ligation or occlusion. Tubal ligation or occlusion is carried out by laparoscopy or laparotomy and is typically performed under general anaesthesia. Vasectomy is typically performed with a local anaesthetic.

Some patients may be eligible for a sterilisation procedure performed in the public health system, however, most patients will need to seek private treatment. Vasectomies are also performed in some primary care clinics. Some patients may be eligible for assistance from Work and Income (WINZ) to assist with the cost of a vasectomy (see: www.workandincome.govt.nz/eligibility/health-and-disability/vasectomies.html).

Sterilisation options are not intended to be reversed. Reversal procedures may be possible, depending on the technique used, but are more complex than the initial sterilisation procedure and may not be successful.

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**Contraception in transgender patients**

Female to male transgender or gender diverse patients may require contraception, unless they have undergone surgical procedures which result in infertility. Gender affirming hormone treatment should not be relied on as a method of contraception as pregnancies can still occur in female to male transgender patients using testosterone; discussion with an endocrinologist involved in the patients care is recommended.

DMPA injections, progestogen implant, or copper or progestogen IUDs may be preferred options as they do not interfere with the process of masculinisation, however, IUD insertion may be more difficult than in other patients due to cervical atrophy associated with testosterone treatment. Contraceptive options more likely to result in amenorrhoea, such as DMPA or a progestogen IUD, may be preferred by some patients.

For further information on contraception in transgender patients, see:

- The NZF: www.nzf.org.nz/nzf_70819
Acknowledgement: Thank you to Dr Beth Messenger, National Medical Advisor, Family Planning New Zealand for expert review of this article

N.B. Expert reviewers are not responsible for the final content of the article.

References:


This article is available online at: www.bpac.org.nz/2019/contraception/options.aspx
Condoms: advising on the options

Condoms are the only form of contraception that protects against both sexually transmitted infections (STIs) and unplanned pregnancy. There is a selection of subsidised condoms available in New Zealand and some patients may require guidance to ensure correct and consistent use.

**KEY PRACTICE POINTS:**

- If external (male) condoms are used correctly on every occasion of sexual intercourse over a year the rate of pregnancy is approximately 2%; however, typical use results in a yearly rate of pregnancy of 13%.
- If used correctly, all types of condoms are effective at preventing transmission of most STIs, including HIV, syphilis, gonorrhoea, chlamydia and hepatitis B.
- Condoms should be routinely and widely offered in primary care to ensure equitable access.
- A variety of external latex condoms are fully subsidised in New Zealand.
- Latex-free condoms are available but not subsidised; however, these products should only be necessary in a small number of people with latex allergy (approximately 4% of the general population).
- Internal (female) condoms are available but not subsidised; there is an approximately 5% rate of pregnancy with correct use on every occasion of sexual intercourse over a year, however, typical usage results in a yearly pregnancy rate of 21%.

**The benefits of regular condom use**

The first external (male) condoms were developed in the 16th century to slow the spread of syphilis. Originally these were bespoke and made from linen or animal gut, but in the twentieth century mass production resulted in a variety of condom sizes, shapes, colours, flavours and thicknesses. The majority of external condoms are constructed from latex, although they may be made from other materials including polyurethane, polyisoprene and nitrile.

**Recommend condoms widely to prevent the spread of STIs**

Condoms are the only method of contraception that protects against sexually transmitted infections (STIs). They are often used in combination with another contraceptive, to prevent STI transmission and to further reduce the risk of an unintended pregnancy.
The advantages of external condoms:

- Protect effectively against many STIs
- Do not affect fertility
- Do not cause hormonal-related adverse effects
- May result in sex lasting longer, due to decreased sensitivity
- Provide foetal protection against STIs, if used during pregnancy

The disadvantages of external condoms:

- Need to be stored in an easily accessible location
- Breakage or slippage may occur requiring emergency contraception
- Incorrect use may result in pregnancy
- May be uncomfortable if an inappropriate size is used
- The sensation of sex may be dulled
- Latex-free condoms (not subsidised) are required if either partner has a latex allergy

Condoms substantially reduce the risk of STI transmission occurring through discharge to or from the penile urethra during vaginal or anal sex, e.g. HIV, gonorrhoea, chlamydia and hepatitis B. Dermal and oral transmission of STIs, e.g. herpes and human papillomavirus (HPV), is reduced, but not eliminated through the regular use of condoms as they may not cover all infectious areas.

**Table 1: Selection guide for fully-subsidised condoms in New Zealand**

<table>
<thead>
<tr>
<th>Condom width</th>
<th>Brand</th>
<th>Thickness</th>
<th>Length</th>
<th>Additional features</th>
</tr>
</thead>
<tbody>
<tr>
<td>49 mm</td>
<td>Shield 49</td>
<td>0.065 mm</td>
<td>Information not available</td>
<td>–</td>
</tr>
<tr>
<td>53 mm</td>
<td>Shield Blue</td>
<td>0.065 mm</td>
<td>Information not available</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Gold Knight</td>
<td>0.065 mm</td>
<td>180 mm</td>
<td>Strawberry or chocolate flavoured lubricant</td>
</tr>
<tr>
<td>56 mm</td>
<td>Gold Knight</td>
<td>0.065 mm</td>
<td>180 mm</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Durex Extra Safe</td>
<td>0.08 mm</td>
<td>190–195 mm</td>
<td>Slightly thicker with extra lubricant</td>
</tr>
<tr>
<td></td>
<td>Durex Confidence</td>
<td>0.065 mm</td>
<td>“Shaped”</td>
<td></td>
</tr>
<tr>
<td>60 mm</td>
<td>Shield XL</td>
<td>0.065 mm</td>
<td>Information not available</td>
<td></td>
</tr>
</tbody>
</table>

The effectiveness of external condoms

Pregnancy occurs in approximately 2% of females when external condoms are used correctly as the sole form of contraception during every occasion of sexual intercourse over one year. However, condoms are often not used consistently or correctly, therefore typical usage results in 13% of females becoming pregnant each year that condoms are used.

**Condoms are substantially reduced the risk of STI transmission occurring through discharge to or from the penile urethra during vaginal or anal sex, e.g. HIV, gonorrhoea, chlamydia and hepatitis B.**

Dermal and oral transmission of STIs, e.g. herpes and human papillomavirus (HPV), is reduced, but not eliminated through the regular use of condoms as they may not cover all infectious areas.

**Recommending the most appropriate condom**

Ensuring consistent and correct use are the most important considerations when providing patients with condoms. All subsidised condoms available in New Zealand are made from latex and are pre-lubricated. There are differences in the width, thickness, length and shape of subsidised condoms and some patients may require guidance on these issues (Table 1). Condoms made from isoprene (for people with latex allergy – see below) and textured condoms are available over-the-counter from a variety of retail outlets and online stores but are not subsidised.

**Advising patients on the size and type of condom**

The 56 mm condoms are the most commonly prescribed size in New Zealand. However, due to variations in penile size, this width of condom may not be appropriate for all. The length and thickness of some brands of condom does vary slightly, however, this is unlikely to be a significant issue for fit or protection in most cases.

* The manufacturer claims the design makes it easier to apply and more comfortable to wear
Offer patients a selection to try first
All fully subsidised condoms in New Zealand are also available on Practitioner’s Supply Order (PSO). It is recommended that a selection of condoms be available in the practice and offered the first time a prescription for condoms is provided. The prescription can be written with a default option but with instructions for another width or brand of condom to be dispensed if the patient wishes, following discussion with a pharmacist, e.g. “as specified or directed by patient preference”. Filling the prescription can be delayed until the preferred condom size has been determined. If a previous prescription for condoms has been provided, ask if the fit was appropriate.

N.B. Prescription condom dispensing is currently limited to 72 condoms every 90 days due to a global supply shortage.

Additional lubrication is not routinely required with condom use
All subsidised condoms in New Zealand are pre-lubricated; there are no separate lubricant products for use with condoms that are subsidised. There is insufficient evidence to recommend the routine use of extra lubrication for vaginal intercourse. However, additional lubrication may be helpful where there is a history of condom breakage or irritation. There is some evidence to suggest that extra lubrication may help to reduce the risk of condom breakage during anal intercourse.

Water-based, e.g. K-Y Jelly, or silicone-based, e.g. Durex Perfect Glide, lubricants should be used if additional lubrication of latex condoms is required. Oil-based lubricants, e.g. petroleum gel (Vaseline) should not be used with latex condoms as they increase the risk that the condom will break. Lubricating substances such as cooking or coconut oil or body moisturisers should not be used with condoms.

The frequent use of spermicidal condoms is not recommended
There is no evidence that condoms with added spermicide provide any additional protection against pregnancy or STIs than non-spermicidal condoms. Nonoxynol-9, a surfactant that disrupts cell membranes, is the most common spermicide. The use of condoms lubricated with nonoxynol-9 is not recommended as excessive use, i.e. several times a day, increases the risk of urinary tract infections (UTIs) and vaginal or anal irritation which may increase the risk of HIV infection. However, using condoms with nonoxynol-9 is preferable to not using condoms at all.

Thicker condoms are unlikely to provide better protection against STIs
Limited evidence suggests that using a thicker condom does not reduce the risk of a condom breaking. A study involving 283 male couples in England found that the failure rate for condoms 0.074 mm thick was 2.5%, compared to a failure rate of 2.3% for condoms 0.112 mm thick. The majority of the subsidised condoms in New Zealand are 0.065 mm thick, however, the Durex Extra Safe brand is 0.08 mm thick and can be prescribed if there is a history of condom breakage.

Latex allergy is uncommon and non-latex condoms are generally not indicated
Condoms users may report dermal adverse reactions involving irritation of the penis or vagina or redness, rash and/or swelling of the groin or thighs. Mild symptoms may be avoided by using a water or silicone-based lubricant to reduce friction and irritation, or by trialling another brand of condom. When discussing potential adverse reactions to condoms, consider if the symptoms may be caused by a STI and whether a sexual health check is appropriate.

Most people with latex allergy will already be aware of an allergy through previous reactions, e.g. when using latex gloves or dressings or inflating a balloon. Severe latex allergy, e.g. systemic urticaria, dizziness, difficulty breathing or loss of consciousness, is extremely rare. The worldwide prevalence of latex allergy of any severity is estimated to be 4% in the general population, with higher rates in groups who are regularly exposed, e.g. health workers who wear latex gloves. Latex allergy can be managed by using non-latex external condoms or internal condoms (see below); neither of these options are currently subsidised.

Non-latex condoms are indicated while using vaginal creams for fungal infections
Latex condoms should not be used at the same time as vaginal creams for fungal infections, e.g. clotrimazole, miconazole and nystatin, as the condom may be degraded by ingredients in the base of the cream.

Abstinence from sex or the use of non-latex condoms can be recommended while using these creams.

Correct use is essential for condoms to be effective
Key points to cover when discussing the correct use of condoms include:
- Checking the expiry date
- Inspecting the packet carefully for tears and opening it carefully
- Applying the condom correctly, e.g. checking it is the right way up before applying

Detailed instructions on the correct use of condoms are provided with product packaging and Family Planning has instructions available from: www.familyplanning.org.nz/advice/contraception/condoms

N.B. Condoms should not be flushed down the toilet. Latex condoms degrade naturally in landfill.
Provide advice on what to do if a condom fails

Emergency contraception can be administered up to five days after experiencing condom failure. Treatment options that are fully subsidised include:11

- A copper intra-uterine device which is the most effective method and can be used up to five days after unprotected sex
- The oral emergency contraceptive pill (levonorgestrel) is the most convenient method, however, this is only effective within three days of unprotected sex and may be less effective in patients weighing over 70 kg or with a body mass index greater than 26 kg/m²

A sexual health check should be undertaken following condom failure if there is a possibility of STI exposure.5

Further information on emergency contraception is available from: “Prescribing contraception: which option for which patient”

Internal condoms

Internal condoms, also referred to as female condoms, are thin pouches that are inserted into the vagina prior to sexual intercourse. The condom is held loosely in the vagina by a closed flexible ring at one end while an open ring at the other end allows for penile insertion. Internal condoms are “one size fits all” and the products available in New Zealand are generally made from a nitrile polymer and are latex-free.11 Their use has been promoted among sex workers in some countries with high rates of HIV infection as a female-controlled, alternative form of barrier contraception.

Internal condoms are currently not subsidised in New Zealand and are less accessible than external condoms. They can be purchased from the Family Planning website or a limited number of retail outlets and online stores.

Internal condoms are less effective at preventing pregnancy than external condoms

Pregnancy occurs in approximately 5% of females when internal condoms are used correctly as the sole form of contraception during every occasion of sexual intercourse over a year, compared to 2% with external condoms.2 However, internal condoms may not be used consistently or correctly, therefore typical usage results in 21% of females becoming pregnant each year that condoms are used, compared to 13% for external condoms.2

<table>
<thead>
<tr>
<th>The advantages and disadvantages of internal condoms:2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advantages</strong></td>
<td><strong>Disadvantages</strong></td>
</tr>
<tr>
<td>The female partner controls the use of the condom</td>
<td>Not subsidised in New Zealand</td>
</tr>
<tr>
<td>They can be inserted up to eight hours prior to sex</td>
<td>Less effective at preventing pregnancy than external condoms</td>
</tr>
<tr>
<td>They have a soft, moist texture that feels more “natural” than latex and does not dull the sensation of sex</td>
<td>More often used incorrectly than external condoms</td>
</tr>
<tr>
<td>Water, silicone or oil-based lubricants can be safely used with latex-free condoms</td>
<td>Slippage may occur requiring emergency contraception</td>
</tr>
<tr>
<td>They do not need to be removed immediately after ejaculation</td>
<td>Insertion may need to be practiced</td>
</tr>
<tr>
<td>The outer ring may provide additional stimulation</td>
<td>May be uncomfortable for some people</td>
</tr>
</tbody>
</table>
Data on STI prevention is limited

Internal condoms reduce the risk of contracting STIs, including HIV. However, due to a lack of studies it is not possible to directly compare the effectiveness of internal condoms and external condoms for STI prevention.

Using internal condoms correctly

Internal condoms are relatively easy to use, although it is recommended that patients practice the technique before they are used for the first time. External condoms should not be used at the same time as internal condoms.

Problems encountered with the use of internal condoms may include discomfort following insertion, which may be resolved by tucking the inner ring behind the pubic bone, and noise from friction during use which can be resolved with lubrication.


Information is also available from New Zealand Family Planning: www.familyplanning.org.nz/advice/contraception/internal-condoms

Acknowledgement: Thank you to Dr Beth Messenger, National Medical Advisor, Family Planning New Zealand for expert review of this article

N.B. Expert reviewers do not write the articles and are not responsible for the final content.

References

Oral contraceptives: selecting a pill

Oral contraceptive pills are a safe and effective contraceptive method widely used in New Zealand. For patients using a combined ethinylestradiol/progestogen pill, omitting the monthly withdrawal bleed may improve contraceptive efficacy and reduce associated symptoms such as pain, bloating or headache. Progestogen-only contraceptives are a suitable alternative for patients with contraindications to oestrogen use, such as those at high risk of venous thromboembolism.

**KEY PRACTICE POINTS:**

- Combined and progestogen-only oral contraceptives are equally effective for preventing pregnancy; the estimated rate of pregnancy is 2–3 per 1000 during the first year if used correctly and consistently, however, with typical use, the rate of pregnancy is 90 per 1000.
- A reasonable choice for a first-time combined oral contraceptive (COC)-user is a formulation containing ≤ 30 micrograms ethinylestradiol with either levonogestrel or norethisterone.
- Avoid use of COCs in patients with risk factors for venous thromboembolism, myocardial infarction or ischaemic stroke, such as those aged over 35 years who smoke, have migraine with aura or are likely to be immobile for a prolonged period, e.g. undergoing major surgery.
- Progestogen-only oral contraceptives, commonly referred to as progestogen-only pills (POPs), can be used if oestrogen is contra-indicated.
- COCs can be initiated from six weeks post-partum in patients who are breastfeeding; previous guidance recommended waiting until six months post-partum.

**COCs: the first-line oral contraceptive choice**

Oral contraceptives are available in two formulations, a combined ethinylestradiol/progestogen pill and a progestogen-only pill (POP). Combined oral contraceptives (COCs) are generally the first-line choice for those who wish to use an oral contraceptive, unless oestrogen use is contra-indicated. This is because COCs require less strict adherence to regular dosing times than POPs and provide additional non-contraceptive benefits. When COCs and POPs are taken correctly, the estimated rate of pregnancy is 2–3 per 1000 during the first year of use.¹

COCs prevent ovulation, thicken cervical mucus to inhibit sperm penetration of the upper reproductive tract and alter the endometrial lining to make implantation less likely. They are taken as one pill, daily, at approximately the same time of day.

All COCs in New Zealand contain the same oestrogen (ethinylestradiol) in varying doses along with differing progestogens (Table 1). The progestogens vary in their androgenic properties; norethisterone and levonorgestrel...
are more androgenic than desogestrel; drospirenone and cyproterone are anti-androgenic and therefore most effective for treating acne.⁷

**Which COCs are available in New Zealand?**

A range of fully or partly subsidised* COCs are available in New Zealand. Other unsubsidised oral formulations are also available. Formulations with lower doses of ethinylestradiol are just as effective for preventing pregnancy as those with a higher dose.³,⁴

* For partly subsidised COCs, higher subsidy is available with Special Authority approval for patients with a low income if at least one fully subsidised option has been trialled and not tolerated, see: [www.pharmac.govt.nz/2019/02/01/SA0500.pdf](http://www.pharmac.govt.nz/2019/02/01/SA0500.pdf)

<table>
<thead>
<tr>
<th>Oestrogen (ethinylestradiol) dose</th>
<th>Progestogen dose</th>
<th>Brand names</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 micrograms</td>
<td>Levonorgestrel 100 micrograms</td>
<td>Microgynon 20 Loette</td>
</tr>
<tr>
<td></td>
<td>Desogestrel 150 micrograms</td>
<td>Mercilon</td>
</tr>
<tr>
<td></td>
<td>Drospirenone 3 mg</td>
<td>Yaz</td>
</tr>
<tr>
<td>30 micrograms</td>
<td>Levonorgestrel 150 micrograms</td>
<td>Levlen ED Ava 30 Microgynon 30† Microgynon 30 (ED formulation) Monofeme</td>
</tr>
<tr>
<td></td>
<td>Desogestrel 150 micrograms</td>
<td>Marvelon</td>
</tr>
<tr>
<td></td>
<td>Drospirenone 3 mg</td>
<td>Yasmin</td>
</tr>
<tr>
<td>35 micrograms</td>
<td>Norethisterone 500 micrograms</td>
<td>Brevinor **† Norimin</td>
</tr>
<tr>
<td></td>
<td>Norethisterone 1 mg</td>
<td>Brevinor-1 21 Day **† Brevinor-1 28 Day ED</td>
</tr>
<tr>
<td></td>
<td>Cyproterone 2 mg</td>
<td>Estelle-35 † Estelle-35 ED Ginet Diane-35 ED</td>
</tr>
<tr>
<td>50 micrograms</td>
<td>Levonorgestrel 125 micrograms</td>
<td>Microgynon 50 ED</td>
</tr>
</tbody>
</table>

* Fully subsidised  † Partly subsidised

ED = every day formulation – this is a COC regimen that includes placebo pills to be taken during the hormone-free interval. NB. Not all brand names include “ED” even though they are an ED regimen.

† COC formulations that do not contain placebo pills

* Brevinor will be delisted from 01 July, 2019 and Brevinor-1 21 Day will be delisted from 1 Jan, 2020
Cautions and contraindications: when to avoid COCs

Venous thromboembolism (VTE) risk

COC use is associated with a three to 3.5-fold increase in the relative risk of VTE. However, if there are no additional risk factors, the absolute risk of VTE associated with COC use is very small, particularly when compared to the risk during pregnancy and post-partum (Table 2). The risk of VTE is highest in the first few months after initiating a COC and reduces over the first year of use.

If the patient has existing risk factors for VTE, the absolute risk is higher and COCs should not be used.

For information on non-oestrogen-containing contraceptive options appropriate for patients at high risk of VTE, see: “Prescribing contraception: which option for which patient”.

Risk factors for VTE that are contraindications to COC use include:
- Current or past VTE
- Thrombogenic mutations, e.g. factor V Leiden,* prothrombin mutation, Protein S, Protein C, antithrombin deficiencies
- Major elective surgery, any surgery to the legs or surgery resulting in prolonged immobility, i.e. more than one week
- Age ≥ 35 years and smoke ≥ 15 cigarettes per day
  * If homozygous for factor V Leiden or heterozygous with a history of VTE, COCs should be avoided. If heterozygous but no history of VTE and no alternative contraceptive is suitable, COCs may be used but avoid formulations with a higher VTE risk (Table 5).
  † The COC should be stopped four weeks prior to surgery and can be restarted from two weeks after mobilisation.
  ‡ The duration of COC use was not reported in this meta-analysis

Risk factors for VTE where COC use is strongly cautioned, include:
- Family history of VTE in a first-degree relative aged < 45 years
- Immobile for a prolonged period due to illness or disability, i.e. without the added risk of VTE associated with surgery
- Aged ≥ 35 years and smoke < 15 cigarettes per day or stopped smoking less than one year ago
- Obesity (body mass index [BMI] ≥ 35 kg/m²)

Table 2: Risk of VTE for different patient groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Risk of VTE per 10,000 females per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Childbearing age, non-COC users</td>
<td>2–4</td>
</tr>
<tr>
<td>COC users</td>
<td>7–10</td>
</tr>
<tr>
<td>Pregnant and post-partum</td>
<td>20–30*</td>
</tr>
</tbody>
</table>

* The risk of VTE two days before and after delivery is estimated to be 300–400 per 10,000 females per year and for the first 12 weeks post-partum is 40–65 per 10,000 females per year

Best practice tip: Remind patients who use COCs and are going to be travelling to maintain mobility on long-haul flights (> 3 hours). Compression stockings are not essential unless other risk factors for VTE are present. If the patient is going to spend more than one week at an altitude > 4500 metres they should consider switching to a non-oestrogen-containing contraceptive, particularly if they have other risk factors for VTE.

Other cardiovascular disease (CVD) risk

COC use is associated with a 1.6-fold and 1.7-fold increase in the relative risk of myocardial infarction and ischaemic stroke, respectively. However, the absolute risk of each of these outcomes is small unless additional risk factors for arterial disease are present. It is estimated that among 10,000 females the use of COCs for one year would result in:
- Two additional cases of thrombotic stroke
- One additional case of myocardial infarction

COCs should not be used if there are additional risk factors for myocardial infarction or stroke, including:
- Hypertension (systolic ≥ 140 mmHg or diastolic ≥ 90 mmHg) or use of antihypertensive medicines, even if hypertension is well controlled
- Multiple risk factors for CVD, e.g. increasing age, smoking, hypertension, obesity, dyslipidaemia, diabetes
- Current or past ischaemic heart disease, stroke, complicated valvular or congenital heart disease, e.g. pulmonary hypertension, and other vascular disease
- Impaired cardiac function or atrial fibrillation
- Migraine with aura or migraine without aura that is new onset during use of COC
  * Could consider initiating a COC with caution if history of migraine without aura, provided no other CVD risk factors

www.bpac.org.nz/contraception
Current breast cancer
COCs should not be used in patients with current breast cancer and use is strongly cautioned against in those with a history of breast cancer or who are known carriers of gene mutations associated with breast cancer, e.g. BRCA1 or BRCA2.1

N.B. COCs may be protective against ovarian cancer associated with these mutations; discussion with an oncologist is recommended.

Post-partum
COCs can be started from six weeks post-partum if breastfeeding, provided breastfeeding is well established and there are no concerns with the infant’s growth.1, 12

COCs can be started from three weeks post-partum if not breastfeeding, provided there are no other risk factors for VTE; those with additional risk factors should wait six weeks to begin the COC.1

* Other risk factors for VTE post-partum include immobility, transfusion at delivery, BMI ≥ 30 kg/m², caesarean section delivery, haemorrhage, pre-eclampsia, smoking

For further information on suitable contraceptive options post-partum, see: “Providing contraception: which option for which patient?”.

Age ≥ 50 years
The use of COCs is not recommended in those aged ≥ 50 years due to the risks outweighing the benefits.13

For further information on suitable contraceptive methods for older patients, see: “Prescribing contraception: which option for which patient”.

For further information on medical conditions where COC use is contraindicated or cautioned, e.g. systemic lupus erythematosus, refer to the New Zealand Formulary: www.nzf.org.nz/nzf_4178 and the United Kingdom Medical Eligibility Criteria: www.fsrh.org/standards-and-guidance/external/ukmec-2016-digital-version/

Starting a COC: selecting a dose and formulation
A reasonable option for a first-time COC user is 30 micrograms ethinylestradiol with either 150 micrograms levonorgestrel or 500 micrograms norethisterone. A lower dose of ethinylestradiol is recommended for older patients, e.g. > 40 years.13

The choice of oral contraceptive may also be influenced by whether the patient seeks non-contraceptive benefits from the medicine, e.g. a formulation containing cyproterone may be appropriate for a patient with acne or polycystic ovary syndrome, however the benefits should be weighed against the higher VTE risk.

If a patient experiences adverse effects with one COC, another formulation may be trialled (see: “Adverse effects depend on dosing and formulation” and Table 3).

COCs can be initiated on any day of the menstrual cycle, however, if starting six or more days after the onset of menses, condoms should be used for the first seven days of hormone pills.

Tailored regimens can be offered to omit the pill-free week
COCs are typically taken in a regimen of 21 “active” hormone pills followed by a hormone-free interval of seven days, during which withdrawal bleeding occurs. However, there is no evidence to support any health benefits from having a monthly withdrawal bleed.1 Lengthening the hormone-free interval by missing pills at the beginning or end of a cycle may increase the risk of pregnancy by allowing follicular development and ovulation in some patients.1

Omitting the hormone-free interval may improve contraceptive effectiveness, reduce heavy bleeding and improve symptoms associated with the withdrawal bleed, such as bloating/fluid retention, headache and altered mood.1, 6 Data directly comparing the risk of cardiovascular events and cancer between standard and extended regimens are not yet available, however indirect evidence suggests no difference in cardiovascular risk.1 There is also no evidence of endometrial thickening or histological abnormalities with extended or continuous regimens.1 There is an increased risk of breakthrough bleeding when pills are taken continuously, but this declines with time.14

If breakthrough bleeding persists for three to four days when taking pills continuously, the pills should be stopped for four days and then resumed.1

If patients do not wish to omit the hormone-free interval completely, another option is to shorten this period from seven to four days. This reduces the chance of return to ovarian activity and therefore may decrease the risk of contraceptive failure, e.g. if pills are missed.1

A tailored regimen can be recommended to patients who are starting or already using a COC (Table 4). There is an additional cost associated with requiring more pill packs per year, i.e. if used continuously, a six-month prescription will last 18 weeks instead of 24 weeks. However, this cost may be offset by savings made from not having to purchase sanitary products.
Table 4. Examples of different regimens for COC use

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Duration of hormone pills (days)</th>
<th>Hormone-free interval (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>21</td>
<td>7</td>
</tr>
<tr>
<td>Shortened hormone-free interval</td>
<td>21</td>
<td>4</td>
</tr>
<tr>
<td>Extended</td>
<td>63 or 84, i.e. 3 or 4 packets of pills</td>
<td>4–7 (every 3–4 packets of pills)</td>
</tr>
<tr>
<td>Continuous use</td>
<td>Continuous use of active pills</td>
<td>None</td>
</tr>
</tbody>
</table>

Ensure that patients understand how to follow the tailored regimen correctly
Tailoring a COC regimen requires deviation from the instructions on the COC packaging which may lead to medicine errors. Discuss the regimen options with the patient and ensure that they understand how to omit the hormone-free interval, i.e. by discarding the unused placebo pills and starting on the next pack of active pills.

For further information on initiating an oral contraceptive, including changing from another method of contraception, refer to the New Zealand Formulary: www.nzf.org.nz/nzf_4163

Patient information on how to take a pill continuously can be found here: www.familyplanning.org.nz/advice/contraception/combined-oral-contraceptive-pill
Adverse effects and risks associated with COC use depend on dosing and formulation

Lower doses of oestrogen are associated with lower risks. Research has shown that doses of 20 micrograms of ethinylestradiol, daily, are associated with lower risks of VTE, stroke, and myocardial infarction than doses of 30 micrograms and above, daily, but more risk of breakthrough bleeding.¹

The choice of progestogen may influence risks: Evidence regarding the safety of different progestogens is conflicting but suggests that COCs containing levonorgestrel or norethisterone may be associated with lower rates of VTE (Table 5), stroke, and myocardial infarction than COCs containing the newer generation progestogens.¹ In addition, discontinuation rates due to adverse effects such as headache, breast tenderness and nausea are lower for levonorgestrel-containing than norethisterone-containing COCs.¹⁶

Table 5. VTE risk according to COC formulation⁹,¹⁰

<table>
<thead>
<tr>
<th>Group</th>
<th>Risk of VTE per 10,000 females per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-COC users</td>
<td>2–4</td>
</tr>
<tr>
<td>Low-dose* COC with levonorgestrel or norethisterone</td>
<td>5–7</td>
</tr>
<tr>
<td>Low-dose* COC with drospirenone, desogestrel, cyproterone</td>
<td>9–12</td>
</tr>
<tr>
<td>High-dose† COC with levonorgestrel</td>
<td>9–12</td>
</tr>
</tbody>
</table>

* Low dose = 20–35 micrograms ethinylestradiol
† High dose = 50 micrograms ethinylestradiol

Long-term outcomes associated with COC use

Cancer
COCs are associated with a reduced risk of several cancers including endometrial, ovarian and colorectal cancers, but an increased risk of breast and cervical cancers.¹

A longitudinal study conducted in the United Kingdom which followed females* for up to 44 years estimated that COC use resulted in the prevention of:¹⁷
- 19% of colorectal cancers
- 34% of endometrial cancers
- 34% of ovarian cancers

COC use was associated with an estimated:
- 25% of cervical cancers¹
- 3% of breast cancers

The increased risk of breast and cervical cancer was only present in current and recent users; the risk was no longer present in this study five years after stopping the COC.¹⁷

* Average age at recruitment was approximately 28 years; 82% had at least one child at the time of recruitment
† Human papillomavirus (HPV) infection is necessary for the development of cervical cancer. It is not certain whether the COC itself increases the risk of cervical cancer, or whether its use is associated with an increase in HPV infection rates due to sexual activity without a condom. COC use for more than five years is associated with a small increase in the risk of cervical cancer, but the risk reduces over time.¹

Mood changes
Evidence of an association between COC use and changes in mood is variable. In one study of over 600 females, 16% reported a deterioration in mood while 12% reported an improvement with use of COCs.¹⁸ COCs should be used with caution if there is a history of depression and all patients should be monitored for abnormal changes in mood.³

Weight gain due to use of COCs is unlikely
A 2014 Cochrane review covering 49 studies concluded there was no convincing evidence that use of COCs affects body weight or composition, and if any effect exists it is likely to be small.¹⁹
Managing breakthrough bleeding associated with COC use

Some patients may experience breakthrough spotting or bleeding while taking COCs. This is more common within the first three months of initiation and typically settles over time.1

When prescribing a COC, inform patients about the possibility of breakthrough bleeding and provide reassurance that this does not reduce the contraceptive effectiveness of the COC. Patients should also be reminded that missing a pill increases the risk of breakthrough bleeding and, depending on when in the pack it is missed, may reduce the contraceptive effectiveness.

If bleeding does not settle after three months and other causes have been excluded, consider the following strategies to improve breakthrough bleeding:1,2

**Increasing oestrogen dose:** changing to a formulation with a higher dose of ethinylestradiol (to a maximum of 35 micrograms)

**Changing progestogen type:** limited evidence suggests that a levonorgestrel-containing COCs may be preferable over a formulation containingnorethisterone, and that desogestrel may be preferable to levonorgestrel

**Smoking cessation:** breakthrough bleeding is more common in COC users who smoke although the mechanism for this is not well defined

If the first instance of breakthrough bleeding is more than three months following the initiation of the COC or bleeding is persistent consider whether there might be another clinical explanation, e.g. missed pills, sexually transmitted infection, pregnancy, cervical pathology.

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**POPs: the oral contraceptive option when oestrogen use is contraindicated**

Progestogen-only formulations are a suitable alternative for those who wish to use an oral contraceptive but have contraindications to oestrogen use or prefer not to use a COC. POPs thicken cervical mucus to inhibit sperm penetration and may also prevent ovulation (50% of cycles).20 The desogestrel-only formulation consistently inhibits ovulation (97% of cycles), but is not subsidised in New Zealand (Table 6).20

POPs can be initiated on any day of the menstrual cycle, however, if starting six or more days after the onset of menses, condoms should be used for the first two days (48 hours) of hormone pills.

**Which POPs are available in New Zealand?**

There is currently one fully subsidised POP available in New Zealand (Table 6). Although robust head-to-head studies are not available, evidence suggests that when used correctly the different formulations of POPs available in New Zealand are equally effective in preventing pregnancy.20

**Table 6. POP formulations available in New Zealand**

<table>
<thead>
<tr>
<th>Progestogen type and dose</th>
<th>Brand name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desogestrel 75 micrograms</td>
<td>Cerazette</td>
</tr>
<tr>
<td>Levonorgestrel 30 micrograms</td>
<td>Microlut</td>
</tr>
<tr>
<td>Norethisterone 350 micrograms</td>
<td>boringday</td>
</tr>
</tbody>
</table>

- Fully subsidised

**Cautions and contraindications to POP use**

POPs should not be used in patients with current breast cancer. They may be considered with caution, i.e. only if there are no other suitable options, if cancer has been in remission for more than five years.21 POPs, as with COCs, should be used with caution in patients with systemic lupus erythematosus who are positive for antiphospholipid antibodies, and in those with some liver diseases, e.g. decompensated cirrhosis.21
Correct and consistent use is essential for POPs to provide effective contraception

POPs are taken continuously, i.e. an active pill each day. Advise patients considering a POP that regular adherence is essential for these medicines to be maximally effective. Norethisterone and levonorgestrel-only pills must be taken within three hours of the regular dosing time each day. Desogestrel-only pills have a wider window for error and must be taken within 12 hours of the regular dosing time.

Benefits of POPs

POPs offer the same level of contraceptive effectiveness as COCs and can be used in clinical situations where COCs are not recommended.

Adverse effects associated with POPs

Bleeding patterns may be unpredictable, due to the variable inhibition of ovulation; it is estimated that 50% of patients using a POP will continue to have a normal menstrual cycle, 40% an irregular menstrual cycle and 10% no menstrual cycle. Up to 70% of patients using POPs report breakthrough bleeding and 10% report frequent bleeding, i.e. more than five episodes in 90 days.

Problematic bleeding does not always settle over time. Changing to a different POP, e.g. a desogestrel-only pill, may

Recommendations for missed COCs or POPs

A missed COC pill is when ≥ 24 hours have passed since the regular dosing time. The missed pill should be taken as soon as it is remembered, and the next pill taken at the usual time, even if that means taking two pills at once. No extra contraceptive precautions are necessary.

If two or more COC pills are missed, one active pill should be taken as soon as it is remembered, and the normal regimen then resumed. Condoms should be used, or sex avoided, until seven consecutive hormone pills have been taken. For patients using a standard COC regimen, additional precautions depend on when in the regimen the pills are missed:

- Week 1 (after hormone-free interval) – if unprotected sex has occurred during the hormone-free interval or week 1, consider use of emergency contraception
- Week 3 (prior to hormone-free interval) – omit the hormone-free interval

Theoretically, up to eight consecutive pills could be missed during week 2 or 3 of a standard regimen or at any time during a continuous regimen, before additional contraceptive precautions would be required (provided the hormone-free interval is omitted if the missed pills are in week 3 of a standard regimen, and seven hormone pills were taken consecutively before the missed pills). However, evidence is lacking on the outcomes of this practice therefore there is currently a lack of consensus on this recommendation.

For POPs, a missed pill is if more than three hours have passed since the regular dosing time for norethisterone or levonorgestrel-only pills or more than 12 hours for desogestrel-only pills. The missed pill should be taken as soon as it is remembered. If more than one pill has been missed, only one should be taken. The next pill should be taken at the regular dosing time and condoms should be used, or sex avoided, for the next 48 hours. If unprotected intercourse has occurred after the missed pill and within 48 hours of restarting the POP, emergency contraception should be used.

Vomiting and diarrhoea may interfere with the absorption of COCs and POPs. If vomiting occurs and less than two hours have passed since taking a COC or POP, another pill should be taken as soon as possible. If the replacement POP is taken more than three hours after the regular dosing time (12 hours for a desogestrel-only pill), additional contraceptive precautions will need to be taken during the illness and until two consecutive hormone pills have been taken.

If vomiting or diarrhoea is persistent, i.e. lasting more than 24 hours, an additional contraceptive method should be used during the illness and until:

- Seven consecutive hormone pills have been taken if using COCs
- Two consecutive hormone pills have been taken if using POPs

POPs may be used when breastfeeding and can be initiated at any time post-partum, unlike COCs which should not be used in the first six weeks if breastfeeding (see: “Cautions and contraindications: when to avoid COCs”).
improve bleeding regularity in some patients. An alternative method of contraception may be required in some cases.

N.B. There is no convincing evidence that POPs cause weight gain.

Interactions between COCs or POPs and other medicines

The effectiveness of COCs and POPs can be reduced by interactions with medicines that induce hepatic metabolism by the CYP3A4 enzyme, e.g. rifampicin, rifabutin, carbamazepine, oxcarbazepine, nevirapine, phenytoin, phenobarbital, primidone, rifabutin, St John's wort and topiramate. COC or POP absorption may be reduced by concurrent use of laxatives if they cause diarrhoea or are used excessively or inappropriately.

For further information on the use of antiepileptic medicines in females, see: www.bpac.org.nz/2018/antiepileptic.aspx

Most broad-spectrum antibiotics do not interact with oral contraceptives

Most antibiotics, aside from rifampicin and rifabutin, do not have a clinically relevant interaction with oral contraceptives and patients do not need to take extra precautions as long as they are taking their contraceptive consistently and correctly. However, if the antibiotic or the illness it is treating causes vomiting or diarrhoea, additional contraceptive precautions might be required (see: “Recommendations for missed COCs or POPs”).

Reminder: accredited pharmacists can supply selected oral contraceptives without a prescription

The reclassification of selected oral contraceptives in 2017 allows accredited pharmacists to supply the following formulations without a prescription to medically eligible patients:

- COCs with ≤ 35 micrograms of ethinylestradiol combined with levonorgestrel or norethisterone (can be supplied to patients aged 16 – 39 years)
- POPs with levonorgestrel, norethisterone or desogestrel alone (can be supplied to patients aged 16 – 52 years)

Registered pharmacists must complete an approved training programme to be able to supply these oral contraceptives.

A comprehensive assessment is required to determine whether the patient meets the requirements for the pharmacist-supply of the COC or POP. The selected oral contraceptive must have been prescribed by a medical practitioner in the last three years, the patient must have had at least one further appointment with a medical practitioner since initiating the oral contraceptive and the patient must see a medical practitioner at least once every three years (to assess continued suitability of the oral contraceptive and for a sexual health check). The pharmacist must supply the same formulation of oral contraceptive that the patient was originally prescribed (refer to the Practice Guidelines for some exceptions to this). With consent from the patient, the pharmacist should notify the patients medical practitioner that they are supplying their COC or POP.

For further information on the use of antiepileptic medicines in females, see: www.bpac.org.nz/2018/antiepileptic.aspx
Acknowledgement: Thank you to Dr Beth Messenger, National Medical Advisor, Family Planning New Zealand for expert review of this article

N.B. Expert reviewers do not write the articles and are not responsible for the final content.

References:


This article is available online at: www.bpac.org.nz/2019/contraception/oral-contraceptives.aspx
Depot medroxyprogesterone acetate (DMPA) injections: an intermediate option

Depot medroxyprogesterone acetate injections are a form of hormonal contraception administered every 12 weeks for optimal effect. Despite being associated with variable changes in bleeding patterns and a delayed return to fertility when stopped, it is a preferred method of contraception for many people as it does not rely on daily adherence or require an insertion procedure.

**KEY PRACTICE POINTS:**

- DMPA injections are a highly effective form of contraception; the estimated rate of pregnancy during the first year of use is 2 per 1000 if administered every 12 weeks.
- DMPA injections are a suitable option in many cases when oestrogen-containing contraceptives are contraindicated.
- The decision to initiate use should involve a comprehensive discussion regarding the potential risks and adverse effects; in particular, the patient should be aware that irregular bleeding patterns are common during the first year of use and that return to fertility can be delayed after stopping injections.
- Approximately half of those receiving DMPA injections report amenorrhoea after 12 months of use, which may be beneficial in those who have experienced menorrhagia or dysmenorrhoea during their menstrual cycle.
- Although evidence of adverse clinical outcomes is lacking, DMPA injections are associated with a reduction in bone mineral density, therefore alternative methods of contraception should be considered first in those aged under 18 years or of any age with risk factors for osteoporosis.
- The risks and benefits should be re-evaluated at least once every two years in every person using this form of contraception.

**Depot medroxyprogesterone acetate (DMPA) injections are an effective form of hormonal contraception**

DMPA (Depo-Provera) is a fully subsidised form of progestogen-only contraception administered via intramuscular injection. Its primary effect is to reduce the chance of ovulation by limiting follicle-stimulating hormone and luteinizing hormone secretion. In addition, DMPA injections can alter cervical mucus to prevent sperm penetration, as well as thin the endometrial lining to make it unsuitable for implantation.

**DMPA injections may be preferred by people who:**

- Have difficulty adhering to daily oral contraceptive regimens, e.g. working irregular shifts, forgetful with daily medicine use.
- Prefer a contraceptive with prolonged action but have concerns over the more invasive insertion procedures associated with levonorgestrel implants and intrauterine devices.
- Have a contraindication or caution for oestrogen use, e.g. migraine with aura.
DMPA injections may also be a useful treatment for heavy menstrual bleeding or dysmenorrhea, although its effects on bleeding are unpredictable (see “Altered bleeding patterns are common”).

**Highly effective contraception when administered on time**

When administered at the recommended dose (150 mg) and frequency (every 12 weeks), DMPA has a failure rate of approximately 0.2% in the first year of use, i.e. two pregnancies per 1,000 people treated. Although not encouraged, injections can be given up to 14 weeks after the previous dose without compromising the contraceptive effect if necessary, e.g. if the person is travelling and is unable to attend their 12-week appointment. Clinical studies used to derive “perfect use” failure rates included patients receiving injections every 13 weeks ± seven days.

With typical use of DMPA, which includes inconsistent, late or incorrect use, the failure rate has been estimated at 6%, which is higher than for long-acting reversible contraceptives (LARCs), e.g. levonorgestrel implants. For this reason, along with the fact that effectiveness is user-dependent, organisations such as the Royal Australian and New Zealand College of Obstetricians and Gynaecologists no longer consider DMPA injections to be a form of LARC.

**Injections are generally well-tolerated**

DMPA injections are usually well-tolerated, but adverse effects can include acne, nausea, headaches and hot flushes, the occurrence of which will typically decrease over time. Menstrual irregularities and weight gain can also occur, which may be unacceptable for some people (see “Balancing the benefits and risks of DMPA injections”).

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**Administering DMPA injections**

- The upper outer quadrant of the buttock (i.e. dorsogluteal site) is the preferred IM injection site; the ventrogluteal site is an alternative, to reduce sciatric nerve injury. If excessive adipose tissue is present the deltoid muscle site is another alternative that can be used.
- The first injection should be given within the first five days of starting of a menstrual cycle or within the first five days after giving birth; however, the risk of heavy or prolonged bleeding is increased when injections are administered shortly after giving birth.
  - If breastfeeding, it is generally recommended to delay the first injection until six weeks after giving birth (see: “DMPA injections can be used while breastfeeding”).
- No additional contraception is needed when injections are started within the first five days of the menstrual cycle; if initiated later in the menstrual cycle, additional contraception should be used for seven days following the first injection with a follow up pregnancy test recommended four weeks later.
- Although repeat injections should be given every 12 weeks, they can be administered between 10 and 14 weeks if necessary (Table 1).

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**Table 1. Guidance for repeat DMPA injections administered outside the recommended 12 week interval**

<table>
<thead>
<tr>
<th>Time since last injection</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–12 weeks</td>
<td>Consider administering injection early if bleeding occurs; exclude other causes if bleeding is very heavy</td>
</tr>
<tr>
<td>12–14 weeks</td>
<td>Administer injection; no additional contraception is required</td>
</tr>
<tr>
<td>&gt;14 weeks</td>
<td>Perform a pregnancy test and consider emergency contraception; administer injection if pregnancy is excluded and recommend additional contraception for seven days</td>
</tr>
</tbody>
</table>

For further information on performing intramuscular injections, see: www.bpac.org.nz/BPJ/2015/December/correspondence.aspx#3
Symptoms to monitor. Patients should be advised to report any new-onset chest pain, deep unilateral leg pain or shortness of breath, and investigated for the possibility of a thromboembolic event (see “Cardiovascular risk factors may be a reason not to use DMPA injections”). Mood changes are also sometimes reported. It is recommended that patients with a history of clinical depression are closely monitored during treatment, and the injections stopped if a significant relapse occurs.

Suitable if given concurrently with hepatic enzyme-inducing medicines. A notable advantage of DMPA over other forms of hormonal contraception is that its effectiveness is not influenced by the use of hepatic enzyme-inducing medicines, e.g. antiepileptic medicines, so they can be used at the same time.

When should DMPA injections be avoided?
DMPA injections are contraindicated in people with:
- Current breast cancer or a history of breast cancer; although it may be considered if other forms of contraception are inappropriate and the cancer has been in remission for at least five years
- Undiagnosed vaginal or urinary tract bleeding
- Thrombophlebitis or thromboembolic disorders, or in those with a history of these conditions
- Poorly controlled hypertension; systolic blood pressure ≥ 160 mmHg or diastolic ≥ 100 mmHg
- Multiple cardiovascular risk factors
- Severe hepatic dysfunction, e.g. people with decompensated cirrhosis or malignant hepatic tumours

For a full list of contraindications and cautions, e.g. systemic lupus erythematosus, refer to the NZF at: https://nzf.org.nz/nzf_1005 and the United Kingdom Medical Eligibility Criteria: www.fsrh.org/standards-and-guidance/external/ukmec-2016-digital-version/

Balancing the benefits and risks of DMPA injections
Before beginning treatment, it is important to discuss the potential benefits and risks of DMPA injections and to emphasise that its effectiveness is dependent on adherence.

Altered bleeding patterns are common
DMPA injections are likely to cause changes in bleeding pattern such as amenorrhoea, irregular bleeding or spotting, or prolonged bleeding. As the duration of use increases, amenorrhoea becomes more likely (Table 2). Altered bleeding patterns are the most frequent reason for stopping DMPA use in the first year; if information is provided about this and people are reassured that irregular bleeding patterns are normal, and are likely to settle, it may help with longer term adherence. If bleeding is persistent or problematic, after excluding other causes (e.g. cervical pathology), it can be managed using pharmacological intervention (see “Managing persistent or problematic bleeding”).

Changes in bleeding may be beneficial for some, but are unpredictable
In some people, reduced bleeding or amenorrhoea may be desirable, such as those with menorrhagia or dysmenorrhoea, or those that experience anaemia as a result of their heavy bleeding. However, as the bleeding patterns associated with DMPA are unpredictable, this may be an unreliable management strategy. In people with endometriosis, DMPA injections (using a different dosing regimen) can be useful for reducing bleeding symptoms and pelvic pain.

* Injections are administered at a dose of 50 mg weekly or 100 mg every two weeks for at least six months.

For further information on the pharmacological management of endometriosis, see: www.bpac.org.nz/bpj/2013/april/endometriosis.aspx

Table 2. Prevalence of altered bleeding patterns in people administered DMPA injections

<table>
<thead>
<tr>
<th>Altered bleeding pattern</th>
<th>After three months</th>
<th>After 12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amenorrhoea</td>
<td>10%</td>
<td>47%</td>
</tr>
<tr>
<td>Irregular bleeding</td>
<td>15%</td>
<td>9%</td>
</tr>
<tr>
<td>Prolonged bleeding</td>
<td>33%</td>
<td>12%</td>
</tr>
</tbody>
</table>

There is often a delay in the return to fertility with DMPA injections
A significant factor influencing the decision to use DMPA injections is its association with a delay in the return to fertility once treatment is stopped. This delay is variable, with one follow-up study reporting an average of six months (range two to eleven months) for return of ovulation. There is no evidence that DMPA injections cause a permanent loss of fertility. Following the final injection, it is estimated that 65% of those who wish to become pregnant do so within 12 months, 83% do so within 15 months and 93% do so within 18 months (median time ten months). As such, those wanting to become pregnant in the near future or shortly after stopping contraceptives should consider an alternative method of contraception until they are ready to conceive. If DMPA injections are stopped, another contraceptive should be initiated at the time the next injection would have been due.
DMPA injections can be used while breastfeeding

DMPA injections are considered safe to use while breastfeeding.1, 8, 14 The manufacturer recommends delaying administration until six weeks post-partum if breastfeeding, due to theoretical concerns over an infant’s ability to metabolise DMPA.5 However, there is no evidence of adverse effects on infant growth, health or development or on breastfeeding performance, therefore the UKMEC considers the benefit of use of DMPA in the first six weeks post-partum to outweigh the risks.14 The UK FSRH guidelines advocate the use of DMPA post-partum but recommend to ideally delay administration until day 21 if breastfeeding.1

Managing persistent or problematic bleeding while using DMPA

First-line options (recommended in clinical guidelines)

- A combined oral contraceptive for up to three months (with or without placebo pills), e.g. 30 micrograms ethinylestradiol with levonorgestrel or norethisterone;15 one month is usually sufficient to manage abnormal bleeding
- Oral mefenamic acid 500 mg (partly subsidised), two to three times daily, for up to five days; OR oral tranexamic acid 1 g (fully subsidised), three to four times daily, for up to four days, can be used to reduce an episode of heavy bleeding10

Second-line options (low-level, anecdotal or conflicting evidence)

- Oral medroxyprogesterone acetate* 10 mg (fully subsidised), once daily, for 21 days6, 9
- Oral norethisterone 5 mg (fully subsidised), two to three times daily, for 21 days9

* Family Planning New Zealand recommends oral medroxyprogesterone acetate as the preferred second-line option. This is because there is concern that at high doses norethisterone is converted into oestrogenic compounds, which is not suitable for women who have a contraindication to oestrogen treatment.

DMPA injections are associated with a small amount of weight gain

Current evidence suggests that DMPA injections are the only form of contraception associated with weight gain.15 In clinical studies, an average increase in weight of one to two kilograms over one year of use has been reported.2, 15 Weight gain appears to increase with longer durations of treatment and is most strongly associated with use in people aged under 18 years with an initial body mass index ≥ 30 kg/m².15 Switching to an alternative method of contraception may be advised in those who gain more than 5% of their initial body weight within six months as continued weight gain is likely.15

Other potential health concerns are not well defined

Be aware of potential changes in bone mineral density

DMPA injections are associated with a small reduction in bone mineral density due to its hypo-oestrogenic effect.1, 2 This form of contraception is therefore not a first-line choice in people aged under 18 years as there are concerns that it may influence peak bone mineral density.1 It is recommended that the benefits and risks of treatment should be reassessed every two years, and if risk factors for osteoporosis are identified, e.g. rheumatoid arthritis, inflammatory bowel disease, age over 50 years or perimenopausal, an alternative method of contraception should be recommended.1, 2

Further investigation is required to understand the consequences of these changes

It is not known whether the changes in bone mineral density with DMPA use results in an increased fracture risk or whether longer durations of treatment cause greater losses.1 Some studies suggest that the rate of bone mineral density loss is more significant during the first two years of treatment and slows with continued use, however, this finding has not been consistently replicated. In general, any losses are reversed once treatment is stopped.1

The association with cancer risk requires further investigation

Breast cancer. Evidence on the risk of breast cancer in people who have taken DMPA injections is limited.1 Studies have indicated there may be a weak association—similar to findings with combined oral contraceptives—but absolute increases in risk are generally low and appear to diminish once treatment is discontinued, e.g. there is no increased risk more than five years after treatment ceases.1

Cervical cancer. Studies have found a slightly increased risk of cervical cancer in people using DMPA injections for five years
or more, however, it is not clear if the association is causal or whether confounding factors are involved. As with breast cancer, the risk reduces after stopping treatment.

Other conditions. DMPA injections are not associated with an increased risk of endometrial or ovarian cancers and evidence suggests they may actually have a protective effect. In addition, studies indicate a potentially reduced risk of colon cancer, acute episodes of pelvic inflammatory disease and ectopic pregnancy when using this form of contraception, however, further investigation is required to confirm these benefits.

Cardiovascular risk factors may be a reason not to use DMPA injections

The effect of taking DMPA injections on cardiovascular disease risk remains under scrutiny. A small increase in the risk of venous thromboembolism (VTE) has been noted in clinical trials of progestogen-only contraceptives, however, a causal relationship has not been confirmed specifically for DMPA injections. In addition, it should be considered that the risk of VTE is considerably lower than that associated with pregnancy or use of combined oral contraceptives. There is also insufficient evidence to conclude whether myocardial infarction and stroke are associated with DMPA. In general, clinical decisions should be made based on the severity and number of risk factors, in addition to the likelihood of follow-up. For example, DMPA injections should usually not be used if the person has multiple risk factors for arterial cardiovascular disease, e.g. hypertension and diabetes.

Acknowledgement: Thank you to Dr Beth Messenger, National Medical Advisor, Family Planning New Zealand for expert review of this article

N.B. Expert reviewers do not write the articles and are not responsible for the final content.

References:

Long-acting contraceptives: implants and IUDs

Long-acting contraceptives include progestogen (levonorgestrel) implants, and copper or levonorgestrel intrauterine devices (IUDs). These are the most effective forms of contraception and are recommended as a preferred option in patients who do not wish to become pregnant for a number of years, including those who are young or nulliparous. Long-acting contraceptives provide a “fit and forget” approach to contraception.

**KEY PRACTICE POINTS:**
- Long-acting contraceptives have the highest rates of effectiveness of the available contraceptive methods, and are associated with the highest rates of continuation and patient satisfaction.
- Age and parity are not a barrier: levonorgestrel implants and all types of IUDs can be used by patients of any age, including those who are nulliparous.
- Copper IUDs and a levonorgestrel implant are fully subsidised without restriction. A levonorgestrel IUD is available fully subsidised with Special Authority approval for patients with heavy menstrual bleeding. Some patients may choose to use this form of contraception unsubsidised.
- IUDs are licenced for five to ten years of contraception, but can be used for shorter, and in some cases longer, durations.
- Copper IUDs can be used in many clinical scenarios where the use of hormonal contraceptives is not recommended, such as in those with higher cardiovascular risk.

**Evidence increasingly favours the use of long-acting reversible contraceptives**

Long-acting reversible contraceptives (LARCs) are the most effective reversible contraceptive options available, equally as effective as sterilisation methods. Once removed, the patient’s natural fertility resumes. They do not require regular adherence to be effective and evidence suggests LARCs are a preferred option for many people, including those who are younger or nulliparous. In addition, a higher percentage of people persist with use of a LARC compared to those using other methods such as oral contraceptives or medroxyprogesterone acetate injections.

Long-acting contraceptive options that are fully subsidised without restriction in New Zealand are levonorgestrel implants and a variety of copper IUDs. A levonorgestrel IUD can be prescribed fully subsidised with Special Authority approval for patients with heavy menstrual bleeding and low serum ferritin or haemoglobin levels; this also provides contraception.
levonorgestrel IUD can also be prescribed unsubsidised if patients prefer this to a copper IUD and cost is not a barrier.

* Depot medroxyprogesterone acetate injections are no longer classified as a long-acting contraceptive as they are less effective than IUDs or implants and require patients to return for three monthly visits.¹

**Levonorgestrel implants**

Levonorgestrel implants prevent pregnancy by inhibiting ovulation, as well as preventing sperm penetration by altering cervical mucus.² They are the most effective form of reversible contraception and can provide protection for a period of up to five years. However, many patients will require replacement before this time; patients weighing over 60 kg should generally have the rods replaced after four years due to the possibility of reduced efficacy after this time.³ After removal of the implant, over 90% of patients ovulate within three weeks.⁴

**Placing levonorgestrel implants**

Levonorgestrel implants are available on prescription, or up to three packs are available on a practitioner’s supply order (PSO). Jadelle, the device currently fully subsidised in New Zealand, consists of two flexible rods, approximately the size of match sticks, each containing 75 mg of levonorgestrel.⁵ ⁶ ⁷ The rods are inserted sub-dermally under local anaesthetic using a disposable, sterile trocar, typically on the inside of the non-dominant arm.⁷ N.B. Trocars need to be ordered separately. The insertion procedure should take approximately two minutes, but training is required.⁸

Approximately one in five patients experience local pain, bruising or tingling at the insertion site during the first month of use.⁹ The rods are palpable in the upper arm and a lump or outline may be visible.¹⁰ A small scar at the site of insertion usually occurs.¹⁰

A levonorgestrel implant can be inserted at any time of the menstrual cycle. Depending on the previously used method of contraception, condoms or another form of contraception may need to be used for the first seven days after placing the implant (Table 1). The ideal time for inserting a levonorgestrel implant for patients currently using a combined oral contraceptive (COC) is in their second week (or longer) of active hormone pills, as there will then be no need for bridging contraception (Table 1).

Removal of an implant generally takes longer than insertion, but it should still be a relatively quick procedure. If rods have been correctly inserted, migration to other tissues is not thought to occur, however, there have been rare cases reported of insertion into deep tissue, nerve and vascular injury.¹¹ There is no delay in return to fertility after removal of a levonorgestrel implant so a contraceptive should be initiated immediately if the patient is not planning a pregnancy.¹²

**When should levonorgestrel implants not be used?**

Levonorgestrel implants are contraindicated* in patients with:⁶ ¹¹

- Current breast cancer
- Unexplained vaginal bleeding
- Severe liver disease, e.g. decompensated cirrhosis

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**Training and resources**

**Levonorgestrel implants:**
Contact your local DHB or Family Planning clinic regarding access to training courses.

Animations showing the insertion and removal procedures are available at:

- Insertion: [www.k4health.org/sites/default/files/Animation%20Intro_1.mp4](http://www.k4health.org/sites/default/files/Animation%20Intro_1.mp4)
- Removal: [www.k4health.org/sites/default/files/Animation%20Removal_1.mp4](http://www.k4health.org/sites/default/files/Animation%20Removal_1.mp4)

A continuing professional development online course for medical practitioners and nurses is available from the Goodfellow Unit: [www.goodfellowunit.org/courses/jadelle%C2%AE-progesterone-only-implant-contraception](http://www.goodfellowunit.org/courses/jadelle%C2%AE-progesterone-only-implant-contraception)

**Intrauterine devices:**
IUD insertion training is available from Family Planning: [www.familyplanning.org.nz/courses/course?id=12](http://www.familyplanning.org.nz/courses/course?id=12)

**Patient information:**
Patients can access information about long-acting contraceptives at the Family Planning website. Printed resources for patients can be ordered from: [www.familyplanning.org.nz/catalog/resources](http://www.familyplanning.org.nz/catalog/resources)
Levonorgestrel implants should be used with caution* in patients with:6,11

- A history of breast cancer; would usually only be considered if cancer has been in remission for more than five years and all other contraceptive options are inappropriate
- Risk factors for ectopic pregnancy, e.g. previous history, tubal surgery
- Functional ovarian cysts
- Hepatic dysfunction
- Systemic lupus erythematosus with positive antiphospholipid antibodies


The effectiveness of levonorgestrel implants is reduced when people are also taking hepatic enzyme-inducing medicines, such as some antiepileptic medicines or the antibiotic rifampicin. If use of the enzyme-inducing medicine is short term, an additional method of contraception, e.g. condoms, is recommended during this time and for four weeks following use (rather than removing the levonorgestrel implant). However, if patients require long-term use of a hepatic enzyme-inducing medicine, switching to an alternative method of contraception is recommended.12


### Table 1: Recommendations for additional contraception after switching to the levonorgestrel implant. Adapted from FSRH, 2014*3

<table>
<thead>
<tr>
<th>Contraceptive method switching from</th>
<th>Timing of implant insertion</th>
<th>Additional contraceptive advice</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Up to and including day seven of the menstrual cycle</td>
<td>No additional precautions required</td>
</tr>
<tr>
<td></td>
<td>Day seven of menstrual cycle onwards†</td>
<td>Use condoms for seven days</td>
</tr>
<tr>
<td>Combined oral contraceptives (COCs)</td>
<td>From day two of a hormone-free interval and in the first week of taking active ingredient tablets following a hormone-free interval</td>
<td>Use condoms for seven days</td>
</tr>
<tr>
<td></td>
<td>In the second week or longer of taking active ingredient tablets until day one of a hormone-free interval</td>
<td>No additional precautions required</td>
</tr>
<tr>
<td>Progestogen only pills (POPs) or levonorgestrel IUD</td>
<td>Any time</td>
<td>Use condoms for seven days</td>
</tr>
<tr>
<td>Copper IUD</td>
<td>First five days of menstrual cycle</td>
<td>No additional precautions required</td>
</tr>
<tr>
<td></td>
<td>At other stages of menstrual cycle or in patients with amenorrhoea</td>
<td>Use condoms for seven days. Leave the IUD in situ for seven days if unprotected intercourse occurred in the seven days prior to insertion of the implant.</td>
</tr>
<tr>
<td>Medroxyprogesterone acetate injections</td>
<td>Within 14 weeks of previous injection</td>
<td>No additional precautions required</td>
</tr>
<tr>
<td></td>
<td>More than 14 weeks since the previous injection†</td>
<td>Use condoms for seven days</td>
</tr>
</tbody>
</table>

* For further information, see: www.fsrh.org/standards-and-guidance/documents/cec-ceu-guidance-implants-feb-2014/
† Pregnancy must first be ruled out if unprotected sex has occurred
Levonorgestrel implants have variable effects on bleeding patterns

Most patients experience a change in their typical pattern of bleeding within the first three to six months after insertion of an implant and these changes are variable.\(^3\) \(^9\) Although bleeding patterns may settle after this time, the pattern within the first three months of implant insertion is often predictive of future bleeding.\(^1\) After six months to one year of use, approximately 35% of patients report having regular bleeding similar to their normal menstrual cycle, approximately 25–35% report irregular or infrequent bleeding, and approximately 20% report amenorrhoea.\(^9\) The remainder of patients experience other patterns such as heavy bleeding or bleeding every two weeks.\(^9\) If bleeding is persistent or problematic, it may require pharmacological management; a combined oral contraceptive is usually the first-line treatment to reduce uncontrolled bleeding in patients using a levonorgestrel implant.\(^13\)


Weight gain and mood changes unlikely

Levonorgestrel implants are not associated with changes in weight.\(^5\) Some people may experience mood changes, but observational studies suggest less than 10% discontinue use due to this.\(^5\)

Intrauterine devices

An intrauterine device (IUD) provides contraception by preventing fertilisation and preventing implantation of fertilised eggs.\(^5\) They are effective for five to ten years, or potentially longer, depending on the type (see: Table 2 and “Extended use is possible in some cases”).\(^6\)

Inserting an IUD

IUDs are best fitted by an experienced practitioner, e.g. who inserts an IUD at least once a month, as the risk of perforation and subsequent expulsion are lower and patients typically experience less discomfort.\(^5\)

Assess for STIs: A STI check, and testing if necessary, should be undertaken prior to inserting an IUD. If the patient is asymptomatic, an IUD can be inserted prior to swab results being available, provided they can be promptly contacted if they have a positive result.\(^14\) STIs can usually be treated without the need for removal of the IUD.\(^14\) \(^15\) Antibiotic prophylaxis for STIs prior to IUD insertion in asymptomatic patients is not justified.\(^15\) In patients with symptoms or signs suggestive of a STI, investigation and treatment of any infection should take place before insertion of an IUD.\(^15\)

Timing of insertion: Patients who have a levonorgestrel IUD fitted may require bridging contraception for the first seven days after insertion (Table 3). The copper IUD is immediately effective when fitted. If patients are post-partum, have recently used emergency contraception or insertion is being performed after a termination of pregnancy, additional precautions regarding the timing of insertion may apply; see the NZF for details: [www.nzf.org.nz/nzf_1](http://www.nzf.org.nz/nzf_1).

A follow-up visit is not essential provided that patients understand how to check thread placement and how to recognise symptoms and signs of infection, perforation or expulsion.\(^15\)

Removal: There is no delay in return to fertility after removal of an IUD.\(^15\)

When should IUDs not be used?

Copper or levonorgestrel IUDs should not be inserted in patients with:\(^16\)

- Distortions of the uterine cavity, either anatomical or due to uterine fibroids; patients who have previously had a caesarean section may use an IUD\(^15\)
- Unexplained vaginal bleeding
- Pelvic inflammatory disease
- Purulent cervicitis, chlamydia or gonorrhoea infections
- Puerperal sepsis following birth or following a post-septic abortion
- In the post-partum period, unless initiated within the first 48 hours following delivery; insertion four weeks following delivery is recommended\(^15\)\(^16\)
- Endometrial, ovarian or cervical cancer; consultation with the patient’s oncologist is recommended.
- Gestational trophoblastic disease, until levels of β-human chorionic gonadotropin (βhCG) are undetectable; oral contraceptives are preferred\(^11\)\(^17\)

A levonorgestrel IUD is contraindicated in patients with breast cancer; it might be considered with caution if cancer has been in remission for more than five years and a copper IUD cannot be used.\(^16\)
Table 2: IUDs available in New Zealand

<table>
<thead>
<tr>
<th>Copper</th>
<th>Levonorgestrel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Indicated duration of use</td>
</tr>
<tr>
<td>Choice Load 375</td>
<td>Five years</td>
</tr>
<tr>
<td>Choice TT380 short</td>
<td>Five years</td>
</tr>
<tr>
<td>Choice TT380 standard</td>
<td>Ten years</td>
</tr>
<tr>
<td>Mirena (52 mg)</td>
<td>Five years</td>
</tr>
<tr>
<td>Jaydess (13.5 mg)</td>
<td>Three years</td>
</tr>
</tbody>
</table>

* Recommendations do not apply to nulliparous women aged < 25 years; see “Extended use of an IUD is possible in some cases” for further details

Copper IUDs may initially cause heavier bleeding, levonorgestrel IUDs reduce bleeding

The use of a copper IUD can initially result in heavier and more painful menstrual bleeding, but this typically improves after the first three months and most people report being satisfied with this contraceptive method. Although not listed as a contraindication in most guidelines, the use of a copper IUD may not be ideal in patients who already have heavy, painful menstrual bleeding.

Levonorgestrel IUDs reduce menstrual bleeding and one-half to two-thirds of patients report lighter and less frequent bleeding within three months of use.

IUDs can be used with tampons and menstrual cups; evidence suggests there is no increased risk of expulsion. When removing a menstrual cup, care needs to be taken that the IUD strings are not inadvertently pulled.

Many patients experience increased menstrual pain and cramps

Changes in menstrual pain and cramps are common after insertion of an IUD. One study reported that three months after having a device inserted, approximately one-third of people using a levonorgestrel IUD and two-thirds using a copper IUD had increased pelvic pain and cramps; this rate reduced to approximately 10–15% after six months of use. Some people using a levonorgestrel IUD experience improvements in dysmenorrhoea.

Adverse effects associated with insertion of an IUD are uncommon

Insertion carries a small risk of uterine perforation and vasovagal reaction

Uterine perforation occurs at a rate of approximately 1–2 per 1000 insertions of IUDs; rates are lowest when insertion is performed by an experienced practitioner. The risk is increased to approximately 6 per 1000 insertions for patients up to 36 weeks post-partum or who are breastfeeding. If a perforation occurs, ultrasound or X-ray is typically required to ascertain the degree of perforation or locate the device, followed by laparoscopic removal. Some patients may have mild vasovagal reactions, however, severe vasovagal reactions are rare, with a reported incidence of approximately one in 500 patients.

The risk of pelvic inflammatory disease is very low

Research shows that placement of an IUD is associated with a small increase in the risk of pelvic inflammatory disease (0.5% of insertions), but the risk is only increased within the first 20 days after insertion. Screening for STIs before IUD insertion does not reduce the risk of pelvic inflammatory disease.

IUD expulsion occurs in a minority of patients

Expulsion rates of 2–15% have been reported for periods of follow-up ranging from one to ten years; on average it is estimated that fewer than one in 20 patients over the course
Table 3: Contraceptive advice after insertion of a levonorgestrel IUD if switching from another contraceptive method. Adapted from FSRH, 2015 6,15

<table>
<thead>
<tr>
<th>Contraceptive method switching from</th>
<th>Timing of IUD insertion</th>
<th>Additional contraceptive advice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>None or barrier methods</strong></td>
<td>Days one to seven of menstrual cycle</td>
<td><img src="%E2%9C%93" alt="✓" /></td>
</tr>
<tr>
<td></td>
<td>After day seven of the menstrual cycle</td>
<td><img src="%E2%9A%A0%EF%B8%8F" alt="⚠️" /> Provided pregnancy has been ruled out</td>
</tr>
<tr>
<td><strong>COC</strong></td>
<td>In the second week or longer of taking active ingredient tablets until day 1 of a hormone-free interval</td>
<td><img src="%E2%9C%93" alt="✓" /> Provided no missed pills</td>
</tr>
<tr>
<td></td>
<td>From day two of a hormone-free interval and in the first week of taking active ingredient tablets following a hormone-free interval</td>
<td><img src="%E2%9A%A0%EF%B8%8F" alt="⚠️" /></td>
</tr>
<tr>
<td><strong>POP</strong></td>
<td>Any time</td>
<td><img src="%E2%9A%A0%EF%B8%8F" alt="⚠️" /></td>
</tr>
<tr>
<td><strong>Levonorgestrel implant</strong></td>
<td>Up to three years post-insertion*</td>
<td><img src="%E2%9C%93" alt="✓" /></td>
</tr>
<tr>
<td></td>
<td>After three years post-insertion*</td>
<td><img src="%E2%9A%A0%EF%B8%8F" alt="⚠️" /></td>
</tr>
<tr>
<td><strong>Medroxyprogesterone acetate injections</strong></td>
<td>Within 14 weeks of previous injection</td>
<td><img src="%E2%9C%93" alt="✓" /></td>
</tr>
<tr>
<td></td>
<td>After 14 weeks since the previous injection</td>
<td><img src="%E2%9A%A0%EF%B8%8F" alt="⚠️" /> Provided pregnancy has been ruled out</td>
</tr>
<tr>
<td><strong>Copper IUD</strong></td>
<td>Any time</td>
<td><img src="%E2%9A%A0%EF%B8%8F" alt="⚠️" /> If unprotected intercourse has occurred within the last seven days leave the copper IUD in place and use condoms for a further seven days before changing to levonorgestrel IUD</td>
</tr>
</tbody>
</table>

Key: ✓ No other contraceptive methods are required

* This FSRH advice refers to the Nexplanon implant which is only licensed for three years use. The Jadelle implant used in New Zealand provides contraceptive protection for up to five years after insertion; efficacy may be reduced in those weighing over 60 kg after four years.

Of five years experience IUD expulsion. Expulsion most often occurs in the first three months of use and during menstruation, and rates of expulsion are lower when IUDs are inserted by experienced practitioners.

An IUD should be removed if pregnancy occurs

In the unlikely event that a patient using an IUD becomes pregnant, the device should be removed, if possible, in the first 12 weeks of pregnancy; it is recommended to discuss this with an obstetrician. Continuing a pregnancy with an IUD in place increases the risk of complications such as spontaneous abortion and preterm delivery. Although there is an overall reduced risk of ectopic pregnancy while using an IUD, if a pregnancy does occur, it is estimated that in up to half of cases this will be ectopic. Therefore an early ultrasound scan is required.

Extended use of an IUD is possible in some cases

Clinical guideline groups in the United Kingdom and United States recommend that use of some IUDs can be extended (Table 2), without affecting contraceptive efficacy. This recommendation does not apply at present to nulliparous patients aged <25 years as this patient group was generally not included in studies. Patients who have a copper IUD inserted after age 40 years may continue to use the same device until menopause; the device should be removed when contraception is no longer required.
References:

Acknowledgement: Thank you to Dr Beth Messenger, National Medical Advisor, Family Planning New Zealand for expert review of this article

N.B. Expert reviewers do not write the articles and are not responsible for the final content.