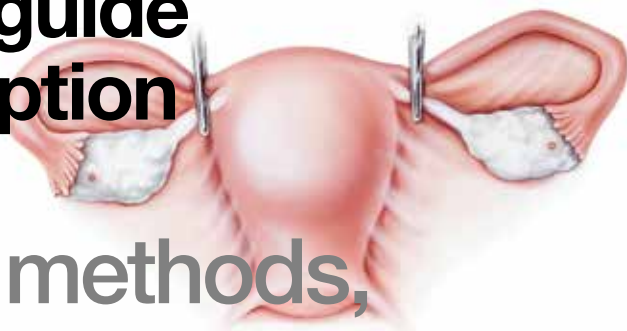




# A practical guide to contraception

## Part 3:

### Traditional methods, sterilisation and emergency contraception



#### Key points

- The traditional methods of contraception – the barrier, fertility awareness-based, withdrawal and lactational amenorrhoea methods – are not as effective as modern methods but have a role as contraceptive options.
- The use of sterilisation is decreasing with the increasing availability and acceptability of long-acting reversible contraceptives.
- Barrier methods such as male and female condoms and diaphragms require sustained motivation and correct use to be effective contraceptives.
- Fertility awareness-based methods require an understanding of the female reproductive cycle and a commitment to daily vigilance of physical changes, signs and symptoms.
- All women who are at risk of unintended pregnancy should be aware of emergency contraception, understand how it works and know how to access it.

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Traditional methods of contraception have lower efficacies in typical use than modern methods but are valued contraceptive options. Sterilisation has high efficacy rates but is being used less as long-acting reversible contraceptives become more widely available and accepted. Emergency contraception has a vital role in reducing the number of unintended pregnancies.

**P**ractical information about the barrier methods, the fertility awareness-based methods (FABMs) and the withdrawal and lactational amenorrhoea methods of contraception as well as permanent methods of fertility control are discussed in this third and final article in a series on contraception. Apart from sterilisation, each of these methods has a relatively low typical-use efficacy compared with modern methods, in particular the long-acting reversible contraceptives (LARCs).<sup>1</sup> However, it is important to acknowledge their role within the range of contraceptive options available to women and their partners. Women may value the nonhormonal nature of these methods but

should be aware of the more effective nonhormonal copper IUD as a highly effective, reversible alternative.

Emergency contraception is also discussed in this article. It plays a vital backup role in the case of unprotected intercourse as well as contraceptive failure. Informing women about the availability of emergency contraception is an important part of all contraceptive consultations.

The first article in this series covered the short-acting hormonal contraceptives (the combined hormonal methods and the progestogen-only pill) and the second article discussed the LARCs. These articles were published in the July and August 2013 issues of *Medicine Today*.<sup>2,3</sup> The

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Figure 1. The female condom.

series is based on the publication *Contraception: an Australian Clinical Practice Handbook, 3rd ed.*, published by the Family Planning Organisations of New South Wales, Queensland and Victoria.<sup>4</sup>

## BARRIER METHODS: MALE AND FEMALE CONDOMS, DIAPHRAGMS

### The male condom

The male condom is a single-use sheath that is rolled on to the erect penis before intercourse and collects ejaculate and pre-ejaculate secretions in the space at its tip. It has the advantage of being readily available and relatively inexpensive.

Male condoms are available in different sizes, colours and flavours, and most are made of thin latex rubber. Nonlatex condoms are available in Australia and are an acceptable alternative for people with a latex allergy or an aversion or reluctance to use latex condoms. These polyurethane condoms are more expensive and may be more susceptible to breakage than latex types. Polyisoprene condoms are another alternative but are generally only available over the internet. Polyisoprene is a synthetic version of latex and condoms made of this material may be suitable for people with a latex allergy.

Although the male condom is self-lubricated, additional water-based lubricant may be applied to the outside. Oil-based lubricants such as vaseline should be avoided with latex products because they increase breakage.

Importantly, the male condom is also

effective at reducing the risk of sexually transmissible infections (STIs) and can be 'doubled up' with another method of contraception to provide dual protection against STIs and unintended pregnancy. It can be used at the same time as all other contraceptive methods except for the female condom (there is an increased chance of breakage and slippage if the two condom types are used together). It can also be used to back up other methods where potential for reduced effectiveness exists, such as when contraceptive pills have been missed or a liver enzyme-inducing drug is being used concurrently.

Male condoms can be an effective contraceptive method when used correctly and consistently. Effectiveness, with reduced breakage and slippage, increases with user familiarity and experience.<sup>5</sup> Correct use, including removal and disposal, should be demonstrated explicitly, preferably with a penis model. Improving condom negotiation skills and self-efficacy is an important strategy to increase effective condom use.

Emergency contraception can be advised if there is condom breakage or slippage. Figures for the percentage of pregnancies occurring in the first year of use of male condoms are 2% in perfect use and 18% in typical use.

### The female condom

The female condom is a loose-fitting lubricated polyurethane sheath with a flexible ring at each end, and collects ejaculate and pre-ejaculate secretions (Figure 1). It is available in a single size and recommended for single use only. It is inserted into the vagina prior to intercourse, and the penis is guided into the sheath. The inner ring at the closed end of the sheath is firm and slides into the vagina to act as an anchor; the outer ring at the open end spreads over the vulva. Allergy and irritation are very rare, and additional water- or oil-based lubricant can be used if required. The condoms are quite slippery so practice before intercourse may be useful. Also, couples may need to get used to their slight rustling noise during use.

The female condom, like the male

condom, protects against STIs. It can be used at the same time as other contraceptive methods (except for the male condom) to provide dual protection against STIs and unintended pregnancy.

Emergency contraception is advised if the condom is displaced or torn during intercourse. Figures for the percentage of pregnancies occurring in the first year of use of female condoms are 5% in perfect use and 21% in typical use.<sup>1</sup>

As with the male condom, using the female condom requires negotiation and, to be effective, requires consistent and correct use. Features that can make the female condom an attractive option for some couples include:

- enhanced transmission of body heat by use of polyurethane rather than latex may improve sensitivity
- use does not rely on a male erection so may be useful with erectile dysfunction
- it can be inserted many hours before sex.

Features that may limit the use of the female condom include:

- more expensive than male condoms (approximately \$3 each)
- limited availability in pharmacies (they are also available from family planning clinics and online).

It is likely that new and more cost-effective female condoms will be available in Australia in the future. The potential advantages of a female-controlled device that simultaneously prevents STIs and unintended pregnancy are significant on a global scale. The challenge lies in developing a device that is effective and cost-effective at the same time as being acceptable to women and their partners.

### The diaphragm

The diaphragm is a silicone dome with a flexible rim that is inserted into the vagina to cover the cervix. The diaphragm acts to prevent sperm transport through the cervix and must be kept in place for at least six hours after intercourse in order for the spermatozoa to be incapacitated in the acidic vaginal environment.

A diaphragm costs approximately \$90 and lasts for up to two years. Cervical caps and latex diaphragms are no longer available in Australia.

The diaphragm can be inserted many hours before sex and therefore does not necessarily interfere with sexual spontaneity. Rather than inserting it intermittently prior to intercourse, some women choose to use their diaphragm almost continuously, with removal for washing once in every 30 hours. This practice is only advised for non-menstruating women because of the small theoretical risk of toxic shock syndrome during menstruation. Women using the diaphragm during menstruation are advised to remove it as soon as practical after the six-hour minimum requirement.

The diaphragm has a lower effectiveness, even with perfect use, than nonbarrier methods, and offers limited, if any, protection against STIs. Effectiveness depends on sustained motivation to use the diaphragm with each act of intercourse and it is a method best suited to women with reduced fertility or those who are accepting of the relatively high failure rate. Emergency contraception is advised if the diaphragm is displaced or damaged during or after intercourse (see Case study 1). Figures for the percentage of pregnancies occurring in the first year of use of the diaphragm are 6% in perfect use and 12% in typical use.<sup>1</sup>

### **Contraindications**

The diaphragm has no significant medical contraindications to its use apart from a history of toxic shock syndrome. Although toxic shock syndrome is extremely rare, a small case-control study suggested a possible increased risk in women using a diaphragm or cervical cap, particularly during menses.<sup>6</sup> Allergy to silicone is extremely rare.

Vaginal or uterine anatomic anomalies including prolapse may compromise the correct placement of the device. Some studies suggest an increased risk of urinary tract infection (UTI) with diaphragm use, particularly in women with recurrent infections, although it is difficult to assess the

## **CASE STUDY 1. DIAPHRAGMS AND EMERGENCY CONTRACEPTION**

Johara comes to see you as she wants to discuss using a diaphragm for contraception.

She is 32 years old, has a 2-year old son and is planning another baby in a year or two. Johara and her partner have been using condoms or the withdrawal method since their son was born and would like to try a different nonhormonal method.

After discussing the use and efficacy of the diaphragm compared with other methods (including the copper intrauterine device), Johara is happy to have a diaphragm fitted for size and is comfortable inserting, checking and removing it.

You discuss emergency contraception with her as a 'back-up plan' in case she has intercourse without the device in place or it is displaced or damaged during intercourse. She is initially concerned about using the emergency contraceptive pill as she was under the misapprehension that it was an abortifacient. You give her written information about effective diaphragm use and hormonal emergency contraception.

strength of the association as intercourse itself can result in UTIs.<sup>7,8</sup> A diaphragm of a size that does not put undue pressure on the urethra should be chosen.

### *Finding the correct 'fit'*

To use a diaphragm correctly, a woman must feel comfortable about inserting the device and confident about feeling the cervix through the diaphragm to ensure it is covered.

Diaphragms are available in sizes 65, 70, 75 and 80 mm diameter. A consultation with a trained practitioner is advised to determine the correct size and to ensure the woman is able to correctly insert and remove the device. Fitting after a pregnancy should be deferred until six weeks postpartum.

The correct size is assessed by estimating the distance from the posterior fornix to the posterior aspect of the pubic symphysis on pelvic examination. 'Fitting sets' are available from the manufacturer to aid the consultation. The size should be reviewed when a diaphragm is replaced, after a pregnancy, if the diaphragm becomes uncomfortable for either partner or with a weight change of 3 kg or more (this may be overly conservative but is based on the recommendations of the UK Faculty of Sexual and Reproductive Healthcare).

The most suitable position to insert the diaphragm varies between women, with some preferring to stand with one foot

elevated and others preferring to squat or lie down. The diaphragm is inserted along the posterior aspect of the vaginal wall towards the coccyx to cover the cervix; the cervix should be palpable through the diaphragm (Figure 2a). A correctly fitted diaphragm just allows the insertion of a fingertip between the diaphragm rim and the pubic arch (Figure 2b). After successfully inserting and removing the diaphragm in the clinic, women may wish to trial the diaphragm for a week or so before review to check its fit and comfort.

Maintenance of the diaphragm requires rinsing with warm water and mild unpreserved soap after use, patting it dry and storing in its case away from direct heat. The use of additional lubricants may lead to slippage but evidence is lacking. The diaphragm should be checked regularly for holes.

### *Spermicide use*

Although the use of a spermicide with the diaphragm is advised in the product information and by the UK Faculty of Sexual and Reproductive Healthcare,<sup>9</sup> spermicidal products are not available in Australia. The additional use of spermicide theoretically increases the effectiveness of the method, but no study has had sufficient numbers to show a significant effect.<sup>10</sup> It is therefore recommended by Family Planning Organisations that diaphragms can



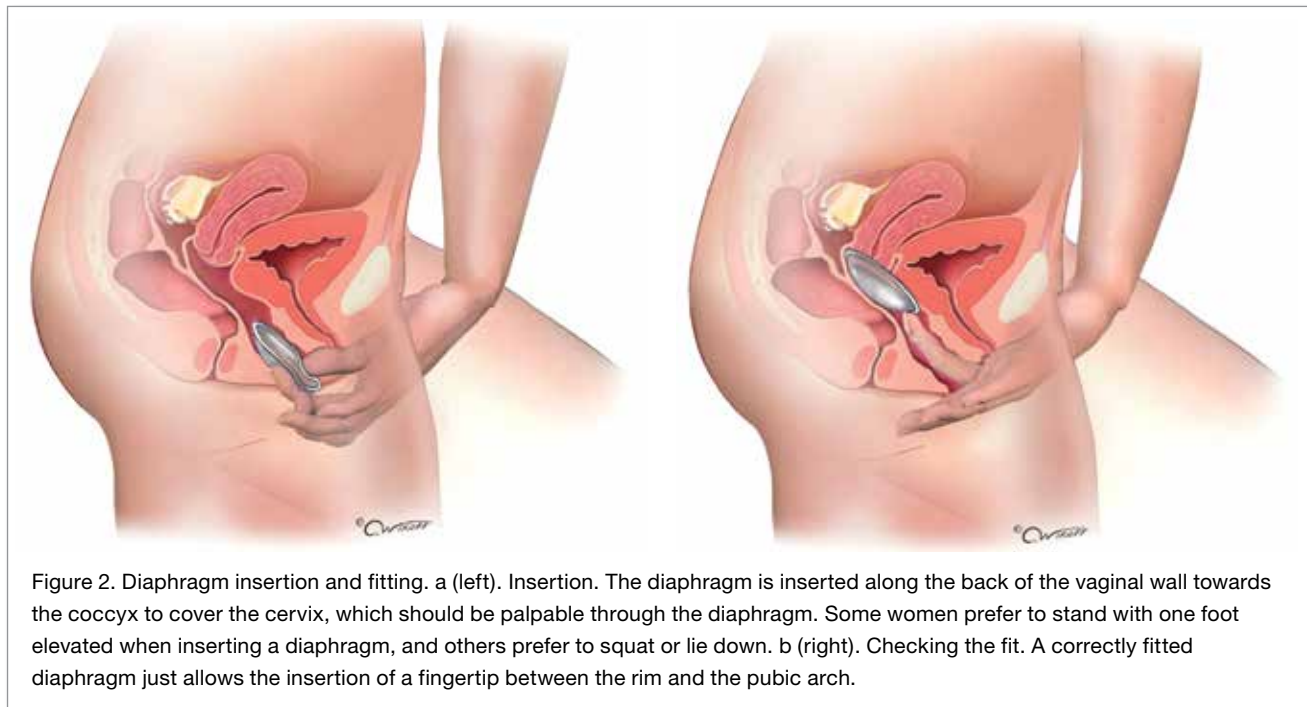


Figure 2. Diaphragm insertion and fitting. a (left). Insertion. The diaphragm is inserted along the back of the vaginal wall towards the coccyx to cover the cervix, which should be palpable through the diaphragm. Some women prefer to stand with one foot elevated when inserting a diaphragm, and others prefer to squat or lie down. b (right). Checking the fit. A correctly fitted diaphragm just allows the insertion of a fingertip between the rim and the pubic arch.

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be used without spermicide but that women should be advised that this method of contraception is less effective than other methods, regardless of the use or nonuse of spermicide.

Women should also be aware that spermicides containing nonoxynol-9 as the active ingredient have been shown to cause vaginal mucosal irritation leading to an increased susceptibility to HIV acquisition.<sup>11</sup> Spermicides are therefore not advised in women at high risk of STIs and are not recommended as a contraceptive on their own because of their low efficacy.<sup>1</sup>

### FERTILITY AWARENESS-BASED METHODS

FABMs include all methods based on the identification of the fertile phase of the menstrual cycle. They rely on predicting times in the menstrual cycle when the couple should abstain from unprotected vaginal intercourse. FABMs provide an alternative means of contraception for women who prefer to avoid other methods and those with religious beliefs that discourage the use of other contraceptives. They do, however, require a thorough understanding of the

female reproductive cycle and commitment to maintaining daily vigilance regarding physical changes, signs and symptoms.

FABMs are unsuitable for women with irregular or anovulatory menstrual cycles, including those who are breastfeeding or perimenopausal. Their effectiveness may also be affected by life events that have a physiological impact on the menstrual cycle (such as illness).

The effectivenesses of FABMs have not been documented in the same way as for other methods of contraception. Perfect and typical effectiveness rates are not available for all FABMs. Percentages of pregnancies occurring in the first year of use of the various methods are quoted to vary from 0.4 to 25%.<sup>1</sup>

#### Identification of the fertile phase of the cycle: broad principles

The WHO defines the days of potential fertility for a couple during each menstrual cycle as the time from the first act of intercourse that may lead to pregnancy to the demise of the ovum.

The survival of sperm in the female genital tract depends on the presence of

alkaline cervical mucus. Although sperm survive for only a few hours in the more acidic environment of the vagina, if there are fertile cervical secretions they can typically live to a maximum of five days in the upper reproductive tract. By seven days, there is a less than 1% probability of sperm survival.<sup>12</sup> By contrast, the average life span of the ovum is 12 to 24 hours, with successful fertilisation unlikely beyond 12 hours after ovulation.

#### Overview of FABMs

The several documented FABMs can be broadly classified as symptoms-based methods, calendar-based methods or combinations of these.

If desired and acceptable, some FABMs can be used in combination with barrier methods to enhance effectiveness and to increase the days during which the couple can have sex.

Women who choose to use FABMs should be encouraged to seek advice and coaching from an expert educator. Contact details can be found at the Natural Fertility Australia website (<http://naturalfertilityaustralia.org.au/about-us>).

## Symptoms-based methods

### Temperature method

The temperature method is based on detecting the rise in body temperature of 0.2 to 0.5°C due to increased levels of progesterone following ovulation. This temperature will remain elevated until the next period.

In this method, the basal body temperature must be taken immediately on waking and is recorded on a fertility chart (Figure 3). Illness, alcohol, too much or too little sleep and electric blankets can all raise the temperature. The beginning of the fertile time cannot be identified; ovulation is determined retrospectively. Intercourse is avoided from the start of menstruation until there are three consecutive days of recorded temperatures that are higher than the preceding six days. This is the end of the fertile time, and after this it is considered safe to have unprotected sex. Use of this method alone may require many days of abstinence.

### Mucus methods

Mucus methods are based on daily observation of the mucus discharge at the vaginal introitus as well as a sensation of wetness or dryness at the vulva. Variations include the Billings Ovulation Method and the 2 Day Method.

Three patterns of mucus are recognised:

- postmenstrual infertile pattern with dense, flaky, sticky mucus and a feeling of dryness at the introitus
- ovulatory or fertile pattern, with rising oestrogen levels as ovulation approaches with clearer, more watery and elastic mucus (similar to egg white) with a feeling of wetness at the vaginal introitus
- postovulatory pattern related to the rising level of progesterone immediately after ovulation causing the mucus to become cloudy, thicker and sticky with a feeling of dryness at the introitus.

Intercourse is avoided on the days of subjective heavy menstrual bleeding. Intercourse is permitted on alternate evenings

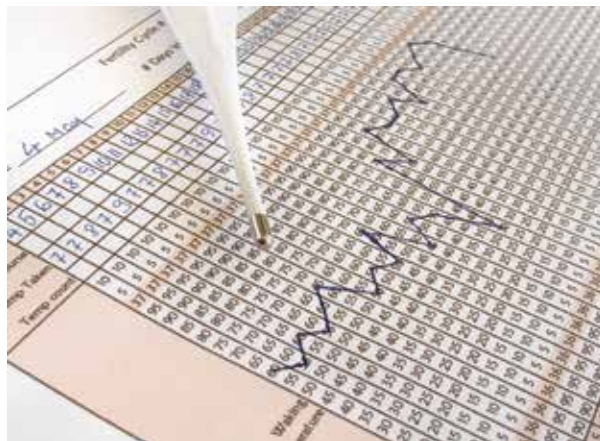


Figure 3. A fertility chart used to record the menstrual cycle and basal body temperature to estimate the fertile days each month.

during the time of the postmenstrual infertile mucus pattern, and then avoided once the fertile pattern is detected and until three consecutive dry days have occurred.

### Symptothermal method

The symptothermal method uses a combination of two or more signs of fertility, including changes in temperature and cervical mucus secretions. The primary indicator of the beginning of the fertile phase is the presence of fertile mucus (clear, watery, elastic mucus), and the end of the fertile phase is confirmed by a combination of basal body temperature and mucus changes.

### Calendar-based methods

Because of variability in the day of ovulation between cycles, calendar methods of contraception are inherently less effective than symptoms-based methods. There are several tools to help with calendar methods, including a colour-coded system of beads ([www.cyclebeads.com](http://www.cyclebeads.com)) and smartphone applications.

### Calendar method

In the calendar (or rhythm) method, at least three consecutive menstrual cycles must be used to calculate an acceptable range of fertile days. A woman's fertile days are calculated by selecting the shortest and longest cycle lengths, subtracting 21 from the shortest cycle and subtracting 10 from the longest

cycle. Unprotected sex should be avoided on the fertile days.

The calculation should be reviewed each month if there is variation in cycle length.

### Standard days method

The standard days method is a variant of the calendar method. Women who record two cycles that are outside the range of 26 to 32 days in any year should not use this method. Taking day 1 as the first day of bleeding, the first fertile day is considered to be day 8 and the last fertile day is considered to be day 19; intercourse is avoided on days 8 to 19 of the cycle.

## WITHDRAWAL

Also known as coitus interruptus, the withdrawal method is widely used. Although not well researched, it may be relatively effective for those experienced with its use. It needs to be used consistently, can interfere with sexual spontaneity and requires the male partner to have awareness and control over his ejaculation. Despite correct use, failure can occur because approximately 40% of men have sperm present in the pre-ejaculate.<sup>13</sup>

## LACTATIONAL AMENORRHOEA METHOD

The lactational amenorrhoea method (LAM) is the informed use of breastfeeding for contraception. Breastfeeding delays the resumption of ovulation postpartum due

to prolactin-induced inhibition of the release of gonadotropin-releasing hormone from the hypothalamus and hence luteinising hormone from the pituitary.

LAM is an important contraceptive method worldwide, especially in countries where access to modern methods is limited. Its effectiveness can be relatively high, up to 98% when all of the following criteria are met:

- the woman remains amenorrhoeic postpartum
- the woman is less than six months post-delivery
- the baby is fully breastfed (no supplements) and there are no long intervals between feeds (no more than four hours during the day or six hours at night, although no definitive guidance exists).

If one or more of these criteria are not met, the woman should be advised to switch to an alternative method of contraception.

In breastfeeding women, the mean time for the return of menses is 28.4 weeks, with a range from 15 to 48 weeks. However, as some women may ovulate before the onset of menses, use of an additional method of contraception can be advised to reduce the risk of a further pregnancy.

## PERMANENT METHODS: FEMALE AND MALE STERILISATION

The uptake of female and male sterilisation appears to be decreasing as the use of LARCs is increasing. Despite the potential for reversal of some sterilisation methods, success in reversal is both limited and costly. Sterilisation should, therefore, be regarded as both permanent and irreversible.

### Decision-making about sterilisation

The decision to have a sterilisation procedure is the individual's alone and does not require partner consent. Although a partner may be present in the consultation, it is important to talk with the individual alone about the decision.

The important considerations that

### FEMALE STERILISATION AND VASECTOMY: CONSIDERATIONS BEFORE REFERRAL

- What has led to the decision to seek sterilisation?
- Who initiated the idea and for how long has sterilisation been considered?
- Is there awareness of long-acting reversible contraceptives and their benefits?
- What are the couple currently using for contraception (there can be a significant delay before the procedure will take place)?
- How far along is the decision-making process and are there any signs of ambivalence or coercion by the partner or others?
- How much does the patient know about the procedure and its effects and complications?
- Is there a clear understanding about the permanent nature of the procedure?
- Has the risk of future regret been considered, should circumstances change (such as death of children/partner, break-up of relationship)?
- What role does fertility play in relation to sexuality?
- Are there concerns about the effect of the sterilisation method on sexual function?

should be raised in the primary care setting before referral for a sterilisation procedure are listed in the box on this page in the form of questions. One of the more important considerations is that of future regret, which is more likely in younger women, nulliparous women and when there is relationship disharmony.<sup>14-16</sup> Women requesting intra-partum, postpartum or postabortion procedures should be aware of the increased rate of regret and possible increased failure rate in these situations, and deferred sterilisation is advised where possible.<sup>15</sup> The possibility of future regret is also applicable to men, and sperm storage in a fertility clinic before the procedure may be a consideration.

Female and male sterilisations are both classified by law in all states and territories of Australia as special medical treatments. If a person lacks the capacity to consent to the procedure himself or herself, the decision to proceed can only be made under the direction of the appropriate state or territory authority.

### Female sterilisation

Female sterilisation is achieved through occluding or disrupting fallopian tubal patency to prevent the sperm fertilising the egg. Techniques include ligating or

removing a section of the fallopian tubes, mechanical blockage using clips, rings, coils or plugs and coagulation-induced blockage using electrical current or chemicals. The method used will depend on the expertise and preference of the local gynaecologist as well as the woman's medical, surgical and obstetric history and preference.

Filshie clip application or other tubal ligation, obstruction or destruction methods can be carried out laparoscopically or via laparotomy under general anaesthetic. They can be performed via mini laparotomy for postpartum sterilisation or at the time of a caesarean section. These methods have a failure rate of less than 0.5% per year although some studies show an increased failure rate in younger women.<sup>1,17</sup>

Hysteroscopic transcervical occlusive methods avoid the need for surgical incision and can be performed under local anaesthetic or light sedation. The Essure technique involves insertion into each fallopian tube of a flexible microinsert that expands to fill and occlude the tube as a result of microblast invasion. Complete occlusion and correct positioning of the microinserts should be confirmed radiologically 12 weeks after placement, and an alternative method of contraception must be used during this time. Hysteroscopic



transcervical occlusive sterilisation is completely irreversible. The effectiveness of the Essure method appears similar to that of other sterilisation methods provided the follow-up protocol is observed.<sup>18</sup>

Although there are no medical conditions that should restrict a woman from voluntarily undergoing sterilisation, careful consideration is required for women younger than 30 years, nulliparous women and postpartum women. Women who have elevated risks for surgery and general anaesthesia may be better suited to a hysteroscopic transcervical occlusive method performed under sedation.

#### *Risks and side effects*

Tubal sterilisation carries surgical and anaesthetic risks, including injury to the bowel, bladder or ureter and unsatisfactory placement of clips. Perforation of the uterus or fallopian tubes, pelvic pain and failure to achieve microinsert placement can occur with hysteroscopic transcervical occlusion. Mortality rates for tubal sterilisation are low (approximately four in 100,000 procedures).<sup>19</sup>

There is a small risk of failure with female sterilisation and if a pregnancy does occur, the probability of an ectopic pregnancy is increased. Women who have had a pregnancy after sterilisation are at increased risk of another failure.

Female sterilisation methods are not associated with a change to the menstrual cycle.

#### *Reversal*

The method of female sterilisation affects the outcome of reversal. Reversal is most likely if clips have been applied to the mid-isthmus portion of the tube and much less likely with tubal destructive or excisional procedures. Hysteroscopic transcervical occlusive methods are completely irreversible. Even after a reversal, only about 50% of women will achieve a pregnancy.<sup>20</sup>

#### **Male sterilisation (vasectomy)**

A vasectomy interrupts the vas deferens to prevent sperm travelling to the ampulla to

mix with the prostatic and seminal vesicle fluids. Each vas is mobilised and transected through a single or bilateral scrotal incision. In 'no-scalpel' vasectomy, a puncture is made through the scrotum and widened sufficiently to externalise and transect the vas. Vasectomy is usually carried out in the outpatient or clinic setting by trained practitioners. Significant medical problems or a history of scrotal or inguinal surgery or trauma usually requires referral to a specialist setting.

Careful consideration of the procedure is required for men younger than 30 years, men who have not had children and men who are anxious about sexual function post-procedure. Precautions are required for previous scrotal injury, a large varicocele or hydrocele, inguinal hernia, cryptorchidism or clotting disorders. Examination is appropriate in the primary care setting to exclude these conditions and to ensure the vasa are easily palpable. Referral to the specialist setting is warranted if the vasa are impalpable or other relative contraindications are present.

Semen analysis is performed at 12 weeks and after a minimum of 20 ejaculations to ensure there are no sperm present in the ejaculate. A small proportion of men do not achieve azoospermia but have very low counts of nonmotile sperm; in these cases, cautious assurance can be provided in consultation with the vasectomy provider.

Failure can occur due to technical errors, recanalisation (occurs in about 0.2% of procedures) or unprotected intercourse before confirmation of azoospermia with semen analysis at three months.

Vasectomy has a failure rate of 0.1 to 0.15%.<sup>1</sup>

#### *Risks and side effects*

The risk of immediate complications with vasectomy procedures is low but may include pain, local bruising, infection and haematoma. A small haematoma can be managed with bed rest, elevation and support, cold compresses and analgesia. A large haematoma usually requires surgical drainage. Infection can result in an

abscess requiring surgical drainage. Epididymo-orchitis results in rapid painful enlargement of the scrotum and is treated with antibiotics and scrotal support. Haematospermia and haematuria are rare and usually settle.

In the longer term, tender or nontender sperm granulomas may develop at the site of the vas division but are usually clinically insignificant. There is no evidence for an increased risk of testicular or other cancers, nor any association with subsequent sexual dysfunction. Antisperm antibodies are found in most men who have undergone vasectomy. They are not associated with immunological or other disease but are thought to reduce the chance of successful pregnancy on vasectomy reversal.

#### *Reversal*

Vasectomy reversal with microsurgical techniques results in a return of sperm to the ejaculate in 85 to 90% of men. However, only about 60% of couples achieve a pregnancy after reversal because of the presence of antisperm antibodies, and rates decline with increasing time since the original procedure.

In vitro fertilisation (IVF) with intracytoplasmic sperm injection (ICSI) may also be considered by couples wanting to reverse the effects of vasectomy. However, the procedure does not attract a Medicare rebate for this purpose and antisperm antibodies may also reduce the chance of a successful pregnancy with IVF.

## **EMERGENCY CONTRACEPTION**

Emergency contraception (EC) is a safe way to reduce the risk of pregnancy after unprotected sexual intercourse, sexual assault or potential contraceptive failure. All women at risk of unintended pregnancy should be aware of the availability of EC methods and be provided with information about how they work.

The first-line EC method in Australia is a single dose 1.5 mg tablet of levonorgestrel (LNG-EC) taken as soon as possible after unprotected sexual intercourse, although it is effective if taken up to five days after

the event. The most important issue is that effectiveness declines with time since the unprotected sexual intercourse.

The hormonal EC method using oestrogen as well as progestogen (the Yuzpe regimen) is no longer recommended as it is less effective and associated with a higher risk of vomiting (a 20% risk compared with 1% with LNG-EC).<sup>21</sup> It should only be used if LNG-EC is not available. This method requires two doses of combined oral contraceptive pills taken 12 hours apart, each dose containing at least 100 mcg of ethinyl-oestradiol and 500 mcg of LNG.

A copper intrauterine device (Cu-IUD) provides EC if it is inserted up to five days after unprotected sexual intercourse. It interferes with sperm movement, inhibits fertilisation by direct toxicity and may prevent implantation of a fertilised egg. The Cu-IUD is more effective (99%) than LNG-EC (85%) and provides ongoing long-acting reversible contraception. Despite these advantages, it is acknowledged that accessing a Cu-IUD quickly can be challenging.

A new EC method in the form of a selective progesterone receptor modulator, ulipristal acetate, has been available in Europe since 2009 and should be available in Australia in 2015. Ulipristal acetate provides effective emergency contraception up to five days after unprotected sexual intercourse and appears to have superior effectiveness to LNG-EC at 24, 72 and 120 hours.<sup>22</sup>

A summary of the advantages and disadvantages of available EC methods is provided in the box on this page.

### Levonorgestrel EC

LNG-EC can be taken as a stat 1.5 mg dose of LNG, provided by a single 1.5 mg LNG tablet or two 0.75 mg LNG tablets. Alternatively, two 0.75 mg LNG doses, each made up of 25 30 mcg LNG tablets (progestogen-only contraceptive pills), can be taken 12 hours apart (or all 50 tablets can be taken in one dose). The 1.5 mg LNG-EC tablet can be purchased without a prescription at pharmacies as an S3 medication. Increasing EC access in the pharmacy

setting is supported by the latest Pharmaceutical Society of Australia guidelines for the supply of LNG-EC.<sup>23</sup>

LNG-EC primarily acts to prevent or delay ovulation by interfering with follicular development. It appears to have no effect once the luteinising hormone surge has commenced. There is no evidence that it prevents fertilisation or inhibits implantation once ovulation has occurred.<sup>24</sup>

LNG-EC is 85% effective (the effectiveness of EC is the estimated percentage of pregnancies prevented which would otherwise have occurred).<sup>25</sup> It is approved for use up to 72 hours after unprotected sexual intercourse but it has proven effectiveness for up to 96 hours. Extending its use to 120 hours (five days) postcoitally is not harmful although the risk of pregnancy is approximately five times higher if LNG-EC is taken on the fifth day compared to within the first 24 hours.<sup>26</sup>

There is no evidence for harm to a developing fetus if LNG-EC is inadvertently taken when the woman is already pregnant.<sup>27</sup> LNG-EC does not provide ongoing contraception and the dose should be repeated if unprotected sexual intercourse occurs more than 12 hours after it was taken. Repeat use of LNG-EC is not harmful but may be associated with menstrual disturbance. Information about ongoing alternative methods of contraception should be provided to women who repeatedly use EC.

There are no evidence-based contraindications to the use of LNG-EC except for allergy and known pregnancy (although it is not harmful to an existing pregnancy). It can be used by women of any age who are at risk of pregnancy, and there are no medical reasons for restricting its use in very young women. Women who are breastfeeding may continue to feed as the infant's exposure to LNG is very low.<sup>28</sup>

Women who are currently using or are within 28 days of stopping a liver enzyme-inducing medication (such as carbamazepine and some antiretroviral medications) are advised to take a double dose (3.0 mg) of LNG-EC. The copper-IUD is the EC method of choice for women using a potent

## EMERGENCY CONTRACEPTION: ADVANTAGES/DISADVANTAGES OF DIFFERENT TYPES

### LNG-EC

#### Advantages

- No absolute contraindications
- Easy dosage schedule
- No prescription required
- Can be used any time in the cycle
- Well tolerated with low incidence of side effects (only 1% incidence of vomiting)
- May be provided as 'advance supply' by a pharmacist or with a script from a doctor

#### Disadvantages

- Cost may be prohibitive for some women (around \$20 to \$30, or more)
- Limited evidence for efficacy between 96 and 120 hours after unprotected sexual intercourse
- Does not provide ongoing contraception
- Is affected by liver enzyme-inducing drugs (double dose is recommended)
- Nonmenstrual bleed may be mistaken for menses

### Cu-IUD

#### Advantages

- Highly effective up to 120 hours postcoitally
- May be used for ongoing contraception
- Not affected by drug interactions or gastrointestinal problems

#### Disadvantages

- Inserted and removed by trained practitioner which limits access
- Contraindications as for Cu-IUDs
- Cost of the device and the insertion procedure may be prohibitive for some women

ABBREVIATIONS: Cu-IUD = copper intrauterine device; EC = emergency contraception; LNG = levonorgestrel.

liver enzyme-inducing medication such as rifampicin. Common nonliver enzyme-inducing antibiotics do not reduce the effectiveness of LNG-EC.



**CASE STUDY 2. EMERGENCY CONTRACEPTION**

Sara is a 19-year-old student. She started university earlier in the year and has just started a sexual relationship with a 21-year-old male student. She has had two other sexual partners this year. She usually uses condoms but occasionally relies on withdrawal. She comes to see you to discuss contraception as she recently had a 'pregnancy scare'.

Sara and her partner were using condoms but one came off during sex. She bought the emergency contraceptive pill from a pharmacy the next day and took it immediately. As her period was a week late, she did a pregnancy test (it was negative). After the anxiety of thinking she might be pregnant, Sara has come to see you to discuss contraception as she does not wish to get pregnant for at least three to five years.

You discuss all options of contraception with Sara. She considers 'quick start' with the Pill or the vaginal ring but instead takes away information sheets on the contraceptive implant and hormonal IUD as she says she has trouble remembering the Pill and the vaginal ring is too expensive. You obtain a urine sample for a chlamydia test and Sara arranges to come back after her next period. You also give her a script for the etonogestrel implant and she plans to have it inserted at the next appointment. You discuss continuing condom use with Sara as future STI protection.

ABBREVIATIONS: IUD = intrauterine device; STI = sexually transmitted infection.

LNG-EC does not increase the risk of an ectopic pregnancy and is not associated with a reduction in future fertility.<sup>29</sup> It is well tolerated with few side effects. Headache and nausea may occur, with vomiting in approximately 1% of women (the dose should be repeated if vomiting occurs within two hours of administration).

Menstrual disturbance is common after hormonal EC. Most women have a menstrual bleed within seven days of the expected time, but it may occur a few days earlier or later than expected.<sup>25</sup> It may be difficult to distinguish nonmenstrual and menstrual bleeding after LNG-EC, and a follow-up pregnancy test three weeks after unprotected sexual intercourse should be considered. The standard urine pregnancy test (sensitive to a beta human chorionic gonadotropin level of 25 mIU/mL) performed less than three weeks after unprotected sexual intercourse may give a false negative result.

Women may choose to initiate an ongoing method of contraception immediately rather than waiting for the next menses. Using the 'quick start' initiation regimen, a hormonal method can be initiated on the

same day as LNG-EC is taken. Additional precautions will be required for seven days if initiated at a time other than day 1 to 5 of the menstrual cycle, and a follow-up pregnancy test at four weeks is important to determine EC failure or contraceptive failure during the first seven days of use.

Guidance for instances where review after the provision of LNG-EC may be required is provided in the box on this page, and the practical application of the advice is illustrated in Case study 2.

**CONCLUSION**

Although barrier methods of contraception, fertility awareness-based methods, the lactational amenorrhoea method and withdrawal have relatively low typical-use efficacies compared with modern methods, in particular the LARCs, they each have a role as a contraceptive option available to women and their partners. Male and female sterilisation, however, have similar efficacy rates to the LARCs but are permanent, and their use seems to be decreasing with the increasing availability and acceptability of LARCs. Emergency contraception has a vital role in the case of unprotected sexual

**REVIEW AFTER HORMONAL EC**

Review is usually not necessary after LNG-EC but is advised in some situations.

Advise a review with a pregnancy test in three to four weeks if:

- there is a high risk of pregnancy when hormonal EC is given
- hormonal contraception is started immediately after taking EC (Quick Start method)
- hormonal EC has been used more than once in a cycle
- the next menstrual period is more than seven days late or is unusual (e.g. unusually light, painful or prolonged).

Advise a review for STI testing in two to three weeks if an STI risk is identified or if symptoms consistent with an STI develop.

ABBREVIATIONS: EC = emergency contraception; LNG = levonorgestrel; STI = sexually transmitted infection.

intercourse as well as contraceptive failure, and all women at risk of unintended pregnancy should be aware of it, understand how it works and know how to access it.

It is hoped that the three articles in this series 'A practical guide to contraception' will assist in raising awareness of all methods of contraception available in Australia. Women in this country have access to multiple methods of contraception, and the role of the healthcare practitioner is to provide balanced information in order to facilitate choice. Consideration of individual medical, social and cultural factors as well as personal preferences is essential, and the use of a validated framework can help in choosing an appropriate contraceptive method. Some women may prefer to consider their options before initiating a particular method, whereas others benefit from an immediate or 'quick start'. Written and web-based information should be provided and is available through the state and territory Family Planning Organisations.

The benefit of the LARCs should not be

underestimated. They have a clear role in effective contraception for women of all ages.

Eliminating all unintended pregnancy is an unrealistic goal and there will always remain a need for safe accessible pregnancy termination services in Australia. Ensuring that women and couples have access to effective and acceptable contraception can reduce the number of unintended pregnancies. Planned pregnancies can optimise the health of the woman and her baby. **MT**

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