How to insert and remove an IUD

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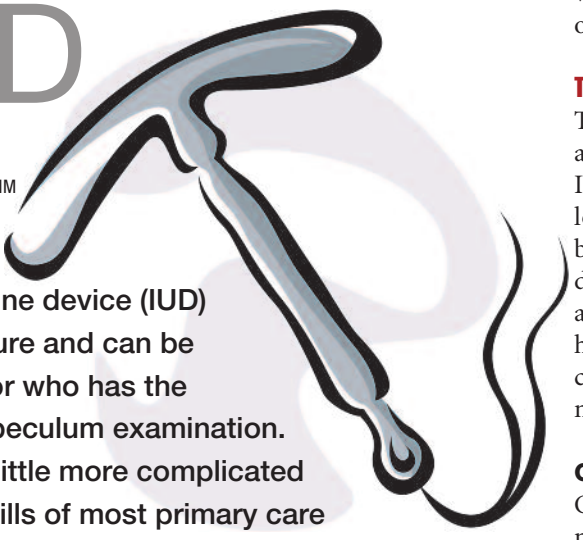

Removal of an intrauterine device (IUD) is a very simple procedure and can be performed by any doctor who has the facilities to perform a speculum examination. Insertion of an IUD is a little more complicated but readily within the skills of most primary care physicians after appropriate training.

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The first modern intrauterine device (IUD) was developed by Richard Richter in 1909; however, the concept of intrauterine contraception is an ancient one. Arab camel traders reportedly placed smooth stones within the uterus of their female camels to prevent pregnancy during long journeys. Hippocrates also described the use of intrauterine contraception.

According to the last national survey,[1] IUDs are used by 1.2% of women in Australia and remain a very useful contraceptive choice provided the patient has been well selected (see the box on page 46) and has been counselled adequately regarding the pros and cons of this method. Prior discussion also allows for sexually transmitted infection (STI) testing (e.g. for chlamydia and gonorrhoea) in women who are at higher risk. Cervical cytology is indicated if the woman is beyond the recommended cervical screening interval because it is difficult to spare the IUD strings if future treatment is required. Any irregular menstrual bleeding should be investigated before inserting the device. There is no indication for routine vaginal swab and culture before insertion of an IUD.

TYPES OF IUD

There are three types of IUD currently available in Australia: two copper-bearing IUDs (the Copper-TT380 and the Multiload-Cu375) and the progestogen-bearing IUD (Mirena). The recommended duration of use varies between devices and ranges from five to 10 years. A smaller hormonal IUD, providing three years of contraception, will be available in the near future.

Copper-bearing IUDs

Copper-bearing IUDs have two main methods of action. Copper is toxic to sperm, killing them before they transit the uterine cavity. In addition, the presence of an IUD within the uterus induces a sterile inflammatory reaction within the endometrium, making conditions unsuitable for implantation. An unfortunate side effect of the latter action is that women with a copper-bearing IUD may experience longer, heavier and more painful menstrual periods than occurred before its insertion. One study indicated an average increase in menstrual loss of approximately 56%.[2] Copper-bearing IUDs have a failure rate of less than 1% in their first year of use.[3]

Progestogen-bearing IUDs

The hormonal IUD slowly releases synthetic progestogen over the lifespan of the device. This thickens the cervical mucus and makes it difficult for sperm to enter the uterine cavity. Progestogen also thins the uterine lining making it unsuitable for implantation, which for

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WHO IS SUITABLE FOR AN IUD?

Broadly speaking most women are suitable for an IUD unless they have a specific contraindication. There are, however, some groups of women for whom use of an IUD may be a particularly good choice. These groups include:

- women requiring long-acting, effective, convenient contraception
- women requesting a nonhormonal or very low hormonal dose contraceptive method
- women whose periods are not particularly heavy or painful are best suited to a copper-bearing IUD because these IUDs tend to exacerbate these symptoms. Progestogen-bearing IUDs are an excellent choice for women with heavy periods because they greatly reduce menstrual bleeding over time. Progestogen-bearing IUDs may also be a particularly good choice for women approaching menopause. Not only do they reduce menstrual bleeding and provide effective contraception but they can be used as the progestogen component of hormone replacement therapy if required
- women who have delivered vaginally are usually considered the best candidates for IUD insertion. IUD insertion is technically more difficult in women who have not had a vaginal delivery and expulsion more likely. However, the risks associated with IUD insertion in nulliparous women are usually very much overstated and light sedation makes for easy insertion in most women
- women at low risk of sexually transmitted infections. This group is usually defined as women in stable, long-standing, mutually monogamous relationships, although even this definition offers no guarantees. It must also be said that scrupulous safer sex practices (in addition to IUD use) for those women outside the above definition would also greatly reduce the risk of STI transmission
- women who are comfortable with the minor surgical procedures required for the insertion and removal of an IUD.

most women results in reduced menstrual bleeding over time. Irregular bleeding is, however, almost universal in the three to five months after insertion, although it rarely occurs with second and subsequent reinsertions. Overall, an 80% reduction in menstrual loss can be expected and some woman experience complete amenorrhoea. The hormonal IUD may disrupt regular ovulation initially but by 12 months of use almost all women have returned to their underlying ovulatory pattern despite a lack of regular bleeding. Hormonal IUDs have a failure rate of approximately one in a thousand.[3]

IUD INSERTION

Theoretical and practical training in IUD insertion is provided by most Australian family planning organisations. IUD insertion in Australia does not generally require the practitioner to hold procedural insurance; however, it would be advisable to check this with one's individual insurer. A formal consent form is also not usually considered necessary, although it is important to document prior informed consent in the patient's notes.

Although all IUDs are inserted using similar principles, the exact insertion procedure varies from device to device. It is important to be familiar with the manufacturer's instructions and it is preferable to have thoroughly practised the technique on a model or simulator before one's first 'live' insertion. The Multiload-Cu375 device uses a simple push technique, whereas the Copper-TT380 and Mirena use a pull-back technique in which the inserting tube around the loaded IUD is removed once the device is correctly in place.

Preinsertion check

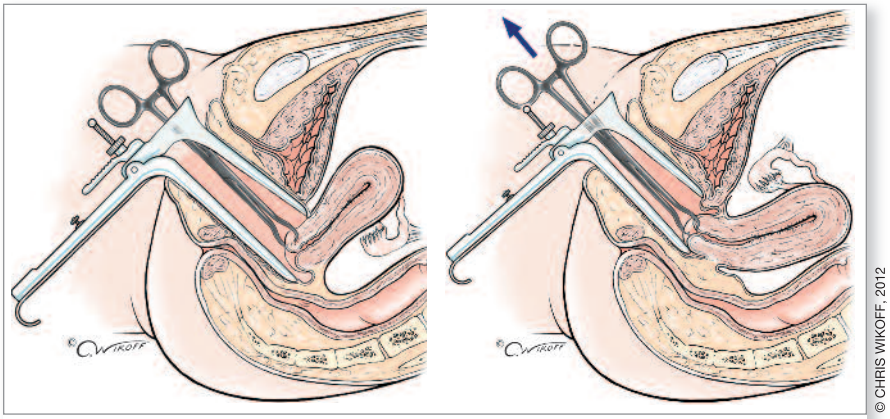
The inserting practitioner should review the patient's history for any contraindications to IUD use. It is also important at this point to clarify any concerns or questions the woman may have. As it may be some time since the IUD was originally discussed with the patient, it would be advisable to briefly review the major complications associated with this method (including the risk of contraceptive failure, changes in menstrual bleeding and the risk of pelvic infection). If cervical swabs or cytology were performed at the initial visit these results should be checked before insertion of the IUD.

It is also important to ensure that there is no possibility of a pre-existing pregnancy. UK family planning guidelines[4] suggest that copper-bearing IUDs can be inserted up to five days after the earliest expected date of ovulation but do not specify this further. Australian family planning organisations[5] take a more conservative view. Assuming that ovulation may occur as early as day 7 in women with shorter cycles, they recommend that copper-bearing IUD insertion should be restricted to the first 12 days of the cycle for those women not using effective alternative contraception. However, other authorities such as Professor John Guillebaud[6] point out that because the copper-bearing IUD rapidly alters the endometrium it should be safe to extend the timeframe for copper-bearing IUD insertion to day 19 in a woman with a regular 28-day cycle (adjusted back for those with shorter cycles). It is this anti-implantation effect that is utilised when a copper-bearing IUD is used for post-coital contraception.

A hormonal IUD, however, takes several days to achieve its endometrial effect

and cannot therefore be relied upon for postcoital contraception. These devices should only be inserted in the first seven days of the cycle or alternatively when a pre-existing pregnancy can otherwise be confidently excluded. If the hormonal IUD is inserted after day 7, the woman should be advised to use additional contraceptive cover for another week. It should also be remembered that pregnancy tests, even blood pregnancy tests, will not reliably exclude a pre-existing pregnancy until three weeks after conception.

In the past, the use of NSAIDs, such as naproxen or ibuprofen, was recommended before IUD insertion but unfortunately recent evidence has failed to demonstrate the benefits of this intervention and it is therefore no longer routine.[7] Immediately before the procedure the practitioner should perform a pelvic examination to establish the position and degree of flexion of the uterus and to exclude any signs of pelvic infection.



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Figures 1a and b. IUD insertion: applying traction. a (left). Apply the tenaculum to the anterior lip of the cervix at 12 o'clock. b (right). Gentle traction should be applied to reduce uterine flexion.

Equipment

All instruments used in the insertion of an IUD should be appropriately sterilised beforehand and laid out on a sterile field. A suggested list of the equipment required is:

- a small or medium speculum
- small pot(s) for antiseptic solution
- cotton balls or swabs
- sponge-holding forceps
- a single-toothed tenaculum
- long-handled scissors
- long-handled artery forceps
- a curved uterine sound marked clearly in centimetres.

The following are also needed:

- gloves – sterile gloves are more commonly used in Australia because it makes it easier to arrange the sterile equipment before the procedure
- 1% plain lignocaine in a 10 mL syringe with 23 G needle
- aqueous antiseptic solution such as chlorhexidine
- chlorhexidine obstetric lotion (optional) – this may help to ease the sound through the cervical os and may provide a clearer indication of the uterine length once the uterine sound is withdrawn
- a basic resuscitation pack, including oxygen and atropine.

Procedure

Gloves should first be put on and a strict no-touch technique should be maintained at all times. It is recommended practice that any used instruments be placed separately on the tray from those yet to be used as a means of preventing cross-contamination.

The speculum should be inserted so that there is adequate visualisation and good access to the cervix. Next the vagina and cervix should be swabbed with the antiseptic solution. The use of local anaesthetic is not mandatory but it does make the subsequent application of the single-toothed tenaculum more comfortable and may also help the cervical os to relax. If used, the local anaesthetic should be injected into the anterior lip of the cervix at about the 12 o'clock position. The patient should be warned that this procedure stings a little (a useful tip is to place the needle close to the cervix and then ask the patient to cough). The usual initial dose is 1 to 2 mL of 1% plain lignocaine. The syringe should be retained in case further anaesthetic is required. Gentle traction should be applied to the tenaculum to reduce uterine flexion (Figure 1).

The next task is to gently sound the uterus (Figure 2). The direction the sound is introduced depends on whether the uterus is anteverted or retroverted. It is important never to force the sound at any time during the procedure because

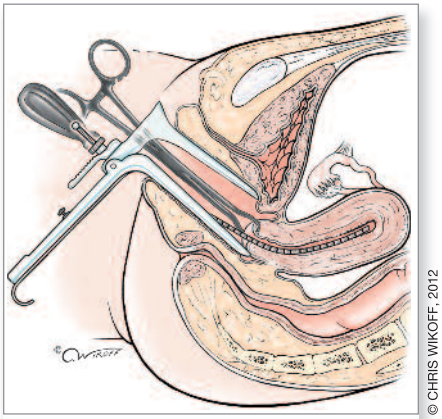

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Figure 2. IUD insertion: sounding the uterus. The sound is marked in centimetres and measures the length from the cervical os to the fundus of the uterus.

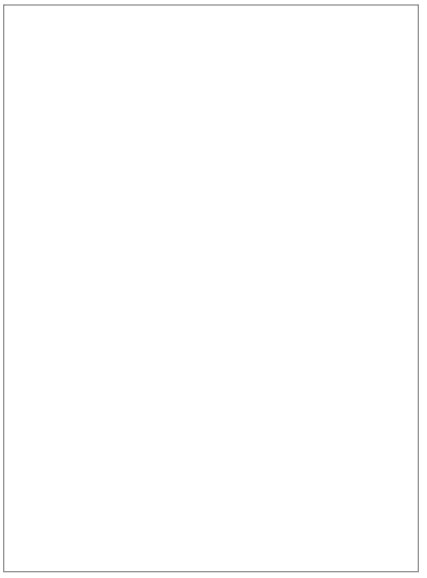
this increases the risk of perforation. Sometimes resistance to the sound is felt at the internal os. If this occurs, sustained gentle pressure or alternatively a soft 'tapping' motion usually allows the sound to pass easily into the uterine cavity. If the patient experiences significant discomfort it may be useful to inject additional local anaesthetic (up to 10 mL in total) at the 3, 6 and 9 o'clock positions on the cervix, before attempting to reintroduce the sound.

When the uterine sound finally meets resistance at the fundus, it should be slowly withdrawn and the length of the uterus from the cervical os to fundus noted. An average uterus should measure somewhere between 6 and 9 cm. Incorrect sounding may result in perforation of the uterus. Alternatively, low placement of the device may result in decreased effectiveness and increased discomfort. At this point, the IUD should be removed from its packaging while maintaining the no-touch technique.

With the Multiload-Cu375 IUD the guard on the inserter tube should be set to the depth indicated by the sound while ensuring that the arms of the device are maintained in a horizontal position as they pass through the cervical os. With both the Copper-TT380 and Mirena IUDs, the horizontal arms must be withdrawn inside the insertion tube before placement is possible. Once the arms are withdrawn the gauge on the device can be set to the sounded length. It is important that the arms are not loaded too early because this may compromise their ability to spring back into their correct position.

Once the device is in the correct position the insertion tube should be gently removed taking care not to catch the strings as this is carried out. The strings should then be trimmed to approximately 2 to 3 cm. If the strings are too long or short they may irritate the patient's partner during intercourse.

After removing the speculum, the women should be offered a sanitary pad and it is recommended that she remain resting for three to five minutes. The patient's notes should include all examination findings as well as the length of uterine sounding, IUD type and batch number, and length of strings visible at the os.



Troubleshooting

- **External os is too tight to permit easy insertion.** Many of these women are suitable for an IUD, but they may require sedation or prior cervical dilatation. In an older woman some practitioners report that using intravaginal oestrogen nightly for a week before IUD insertion may assist in dilating the os to a point where insertion is more easily achieved.
- **Uncomplicated valvular heart disease.** This usually presents no problems in terms of IUD insertion. In cases of complicated valvular heart disease (such as previous bacterial endocarditis or prosthetic valves) antibiotic prophylaxis at the time of insertion and removal has traditionally been recommended to cover the possibility of transient bacteraemia. There is little evidence for this practice and several key advisory bodies in the UK have removed this advice from their IUD protocols.[4] It may be prudent, however, to check with the woman's cardiologist before the procedure.
- **Uterus sounds less than 6 cm.** Gently increasing the traction can be tried to reduce flexion and facilitate sounding. If the uterus still sounds at less than 6 cm, the patient may well have some underlying abnormality, such as a bicornuate uterus, uterine adhesions or fibroids and an ultrasound examination may be useful. Even patients who sound between 6.0 and 6.5 cm have a slightly higher rate of pain, expulsion and bleeding after IUD insertion.
- **Vasovagal reaction.** In such cases, the patient reports feeling faint or nauseated and in rare cases may lose consciousness. If the IUD is not yet in place, the insertion should be abandoned. However, if the IUD is already in place it should not be removed because this usually makes things worse. Often the patient will respond to simple reassurance and elevation of the lower limbs. If not, intravenous atropine 0.6 to 1.2 mg is recommended. If a patient appears extremely nervous at the initial discussion it may be more appropriate to suggest that the IUD be inserted under sedation.
- **Unsuspected cervicitis.** Occasionally, cervicitis is noted at examination immediately before IUD insertion. Appropriate swabs should be obtained and if at all possible IUD insertion should be deferred until after treatment. Aspects of the patient's history should be rechecked, particularly the risk of STIs. One study reported that 11% of women at high risk of an STI experienced IUD-related complications compared with 5% of those categorised as low risk.[8]
- **Presence of vaginitis.** Candidal vaginitis need not delay insertion,

unless the woman experiences undue discomfort during the procedure. Standard oral therapy with fluconazole 150 mg postinsertion is the treatment of choice as it avoids the use of vaginal antifungals in the two to three days before the cervical mucus barrier re-establishes. If bacterial vaginosis is diagnosed clinically at the time of insertion, there is again no need to delay the procedure. However, it is particularly important that these patients receive treatment following insertion of the IUD because bacterial vaginosis has been implicated in the development of pelvic inflammatory disease following instrumentation. A standard metronidazole regimen of 400 mg twice daily for five days can be used or alternatively tinidazole 2 g daily for two consecutive days.

Follow up

For two to three days after the IUD insertion the woman should be advised to avoid sex and to use sanitary pads rather than tampons if required. This reduces the risk of pelvic infection occurring due to the disrupted cervical mucus barrier.

The woman should be told how to feel for her IUD strings. Once she is confident she can locate them, she should be advised to check for the presence and length of the strings after each menstrual period (or monthly in the case of the progestogen-bearing IUD). This simple test provides ongoing reassurance that the device remains in the correct position. The patient is at highest risk of ascending infection in the first three weeks following her IUD insertion,[9] and should be informed of the symptoms of pelvic inflammatory disease and asked to return promptly for advice should she have any concerns. In the absence of unexpectedly severe pain or heavy bleeding, a routine IUD check at six weeks will allow most problems to be addressed quickly. After asking the woman about bleeding patterns and discomfort, the doctor should perform a pelvic and speculum examination. If there are no further problems, the IUD should simply be checked at routine gynaecological visits.

IUD REMOVAL

All women having an IUD removed should be informed that there is usually a very rapid return to normal fertility. This is not an issue if the patient is having another IUD inserted at the same procedure because ongoing contraceptive cover is assured. If, however, removal of the device is requested after day 7 of a 28-day cycle, on a background of previous recent unprotected intercourse, the woman should be warned of the small possibility of a pregnancy occurring in that cycle. If pregnancy is not desired then emergency contraception should be offered as a means of reducing that risk or removal of the IUD deferred until another contraceptive method is effectively in place.

It is no longer mandatory that an IUD must be removed following the diagnosis of pelvic inflammatory disease because there is no good evidence that removing the IUD is associated with a better treatment outcome.[10] If, however, the woman's symptoms have not improved after 48 hours of standard antibiotic treatment most authorities would recommend removal of the device. Depending on the coital and menstrual history, emergency contraception may also be indicated as well as appropriate treatment of the sexual partner(s).

If a woman falls pregnant while using an IUD and decides to terminate the pregnancy the device can easily be removed before or at the time of the termination. If, however, she wishes to continue the pregnancy she should be advised, perhaps somewhat counter intuitively, that the IUD should be removed as soon as possible before the enlarging uterus draws the strings of the device beyond easy reach. Removal of the device is associated with a 20 to 30% risk of immediate miscarriage, approximately double the background risk.[11,12] If the IUD remains *in situ* the rate of later pregnancy loss increases to 55% and may be complicated by infection.[11,12] There is also a 15% chance of premature delivery. There is no evidence to date that the ongoing presence of a copper-bearing IUD increases the risk of fetal abnormality but the safety data for progestogen-bearing IUDs is at present extremely limited.

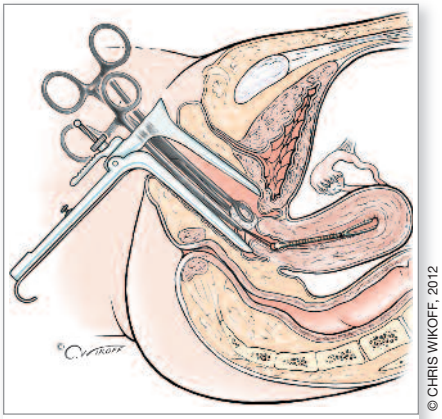


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Figure 3. IUD removal. Gentle persistent traction is applied to the strings close to the os, while countertraction is provided using a swab or cotton ball applied to the cervix.

Equipment

Removing an IUD is usually a simple procedure. However, it is important to have the usual resuscitation equipment at hand in the rare event of a vasovagal reaction. The following items should be available:

- a small to medium speculum
- sponge-holding forceps
- long-handled artery forceps (or a second set of sponge-holding forceps)
- cotton balls/swabs.

Procedure

The woman should be advised that mild cramping is very common as the IUD is

removed, but that this usually settles quickly. A speculum should be inserted so that the cervix and IUD strings are easily seen. There is no need to apply antiseptic solution to the cervix before removal of the IUD. The use of local anaesthetic for this procedure is also not routine and is only required for difficult or complicated removals.

A swab or cotton ball should be placed in the sponge-holding forceps. The long forceps (or the second set of sponge-holding forceps) should be used to grasp the strings of the IUD as close as possible to the cervical os. Then with the other hand, the sponge-holding forceps that are holding the cotton ball/swab should be gently placed onto the cervix so as to apply counter-traction during removal (Figure 3). This action stabilises the cervix and reduces the 'dragging' discomfort sometimes associated with the removal procedure. Alternatively some practitioners simply push the speculum slightly forward to provide counter-traction as they remove the IUD.

At this point the practitioner should apply firm gentle traction to the forceps holding the strings. Very occasionally it may be necessary to reapply the forceps closer to the os during removal so as to reduce any tension on the lengthening strings. It is this firm, gentle but persistent traction that is the key to successful IUD removal. Any jerky movements may cause the strings to break. If the strings are not visible or if removal proves difficult, the patient should be referred to a centre experienced in instrumental removal of the IUD. The woman should remain resting until any uterine cramping has ceased and she feels her normal self again.

Follow up

No routine follow up is required after IUD removal. However, the patient should be asked to return if she has any unexpected pain or heavy bleeding.

CONCLUSION

After many years in the wilderness, IUDs are now seen as a valid contraceptive option for an increasing group of women. The skills required to provide women with up-to-date advice on this method as well as the techniques of insertion and removal will be inevitably more in demand at a primary care level. MT

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COMPETING INTERESTS: Dr Foran has accepted both sponsorship and honoraria for presentations at educational activities from pharmaceutical companies that manufacture and market hormonal-bearing and copper-bearing IUDs.