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Intrauterine contraceptive device

This article refers to copper-containing intrauterine contraceptive devices (Cu-IUDs).

For information on Mirena[®], Jaydess[®], Kyleena[®], Levosert[®] and Benilexa[®], the levonorgestrel intrauterine devices (LNG-IUD), see the separate [Levonorgestrel intrauterine device \(LNG-IUD\)](#) article. For information regarding IUD and LNG-IUD insertion, see the separate [Intrauterine Contraceptives \(IUD and LNG-IUD\) - Management](#) article.

What is a copper-containing intrauterine contraceptive device?

The Cu-IUD is a long-acting reversible contraceptive (LARC). It is typically T-shaped or frameless and is anchored to the myometrium at the fundus. The amount of copper in the device and the type of frame (structure) can affect the effectiveness of different models. The T-shaped models with a surface area of 380 mm² of copper have the lowest failure rates. Earlier models with lower effectiveness are no longer produced worldwide.

The addition of small quantities of silver to the core prevents fragmentation of the copper, extending the lifespan and efficacy. In some countries the addition of other noble metals such as gold is used for the same effect.

Cost-effectiveness

The National Institute for Health and Care Excellence (NICE) advises that all currently available LARC methods (Cu-IUDs, [the LNG-IUD](#), [injectable contraceptives](#) and [implants](#)) are more cost-effective than the [combined oral contraceptive](#) (COC) pill even at one year of use.^[1] IUDs, the LNG-IUD and implants are also more cost-effective than the injectable contraceptives. NICE also advises that increasing the uptake of LARC methods will reduce the numbers of unintended pregnancies. It is important that women should be advised of LARC methods when seeking contraception.

Although IUDs are used by large numbers of women, global distribution of their use is uneven. In a few countries, including China and most of Central Asia, IUDs constitute at least half of all contraceptive use.^[2] In Northern Africa and the Middle East, they represent about a quarter of all use, and in parts of Europe, about a fifth. In the Americas, IUD use is generally well below 10%. In the UK their use is between 11.3 and 12.1%.^[3]

Mode of action

- The primary mode of action is through setting up a cytotoxic inflammatory reaction in the endometrium, which is spermicidal.
- The copper concentration in cervical mucus is also substantial and inhibits sperm motility.
- The copper devices may also prevent implantation if fertilisation occurs. However, the studies suggesting this were of older devices with lower copper content, and there is no clear evidence that modern devices allow fertilisation to occur.
- When used for emergency contraception, the primary mechanism of a Cu-IUD is inhibition of fertilisation, due to the toxic effect of the IUD on the sperm and egg. If fertilisation has already occurred, the IUD may prevent implantation by causing an inflammatory reaction.^[4]

Effectiveness

- Many factors determine efficacy in individual women, including sexual activity, age and parity.

- Cumulative pregnancy rates for IUDs with a copper content >300 mm² are noted as being between 0.1% and 1.1% after the first year of use and around 2.2% for the TCu380A after 12 years. [4]
- A Cochrane review shows a non-significant trend towards a higher failure rate at 1 and 3 years for those using the frameless GyneFix® compared to the TCu380A. [4]
- Over 12 years of use, the models with less surface area of copper have higher failure rates.

Duration of action

- All Cu-IUDs are licensed for at least five years of use and some are recommended for longer use. [4]
- The TCu380S (TT 380® Slimline and T-Safe® 380A QuickLoad) is licensed for 10 years of use.
- FSRH guidance states that if a Cu-IUD with over 300mm² of copper is inserted when a woman is 40 years or over it can be retained and will remain effective until the menopause is confirmed. [4]

Choice of device

- Longer-acting devices are generally preferred, as this reduces the risks associated with removal and re-insertion (perforation, infection, expulsion).
- Short-stemmed devices can be used if the uterine cavity is less than 6.5 cm at sounding.

Types of device currently available in the UK [4]

Device	Copper content (mm ²)	Uterine length (cm)	Licensed use duration (years)
Framed, banded copper arms			
Copper T380 A	380	6.5–9	10
T-Safe® 380A QL	380	6.5–9	10
T-Safe® 380 A	380	6.6–9	10
TT 380® Slimline	380	≥7	10
Flexi-T® + 380	380	≥6	5
Mini TT380® Slimline	380	5–7	5
Framed, copper in stem only			
Nova-T® 380	380	6.5–9	5
UT380 Standard®	380	6.5–9	5
Neo-Safe® T380	380	6.5–9	5
Novaplus T 380® Cu	380	6.5–9	5
Novaplus T 380® Cu 'mini'	380	'mini' size = 5.5	5
UT380 Short®	380	≥5	5

Multiload® Cu375	375	6–9	5
Multi-Safe® 375	375	6–9	5
Ancora® 375 Cu	375	≥6.5	5
Load® 375	375	≥7	5
Flexi-T® 300	300	6.6–9	5
Frameless			
GyneFix® 330	330	Suitable for all uterine sizes	5
GyneFix® 200	200		5
Silver IUD			
Novaplus T380® Ag	380	'Normal' size = 6.5–9 'Mini' size = 5	5

Indications

Contraception

- For most women seeking contraception, the Cu-IUD is a safe option.
- Any Cu-IUD sited in a woman aged over 40 years, can be safely left in situ until the [menopause](#); however, it is only licensed for 10 years use, use for longer is within FSRH guidance, but outside of the product license.^[4]
- It can be a particularly useful option for women whose contraceptive choices are restricted due to the necessary use of enzyme-inducing drugs for other conditions, which interact with many hormonal contraceptives.^[5] (see the separate [Contraception and Special Groups](#) article).

- Advantages as a contraceptive method include:
 - Rapid return of fertility post-removal.
 - Convenience (long-lasting method that is independent of intercourse).
 - No hormonal content.
- Disadvantages include heavier and more painful menstruation and the discomfort of fitting.

Emergency contraception ^[6]

Insertion of a copper-banded IUD prevents conception in 98% of women if:

- Unprotected sexual intercourse (UPSI) occurred before insertion and there is a risk of pregnancy; a Cu-IUD can safely be inserted up to five days after the first episode of UPSI or within five days of the earliest expected time of ovulation.
- For a woman with a regular four-week cycle, this means that an IUD can be inserted up to and including day 19 of her cycle, regardless of when the unprotected sex took place following her last period. However, the LMP must be accurately known and cycles must be regular in order to make the estimation.

The Cu-IUD should always be offered to a woman who is seeking emergency contraception, as it is the most effective method. It may be particularly useful in the following situations:

- Efficacy is the woman's main priority. The Cu-IUD is more effective than emergency hormonal contraception, with a failure rate of < 0.1%. ^[6]
- Exposure occurred up to five days ago, including multiple exposures within this period.
- It is to be retained as a long-term method of contraception.
- There is contra-indication to hormonal methods.

See the separate [Intrauterine Contraceptives \(IUD and LNG-IUD\) - Management](#) article for details on choice of device.

NB: the LNG-IUD is not suitable for emergency contraception.

Contra-indications

Absolute and strong relative contra-indications ^[7]

There are few absolute evidence-based contra-indications and they fall into five categories: infection, pregnancy, uterine factors, gynaecological cancers and adverse reactions to copper. The following list are either UKMEC 4 (absolutely contraindicated) or UKMEC 3 (risks generally outweigh benefits) for insertion of a new device - in many cases the continued use of a device which is already in place is not a contraindication, or sits at a lower level such as UKMEC 2 (benefits generally outweigh risks).

Infection or increased risk of complications should an infection arise

- UKMEC 4:
 - Current [pelvic inflammatory disease \(PID\)](#), purulent cervicitis, [gonorrhoea](#) or symptomatic [chlamydia](#).
 - Current postpartum or post-abortion sepsis.
 - Pelvic [tuberculosis](#).
- UKMEC 3:
 - Asymptomatic [chlamydia](#).
 - Complicated organ transplant eg, graft failure, rejection or cardiac allograft vasculopathy.
 - HIV with a CD4 count of <200 cells/mm³.

Pregnancy

- UKMEC 3:
 - Between 48 hours and four weeks postpartum. UK medical eligibility criteria (UKMEC) state that risks generally outweigh benefits if postpartum insertion occurs between 48 hours and four weeks. Beyond four weeks postpartum, benefits outweigh risks, even if the woman is breastfeeding (there is no increased copper level in breast milk).^[7]

Uterine factors

- UKMEC 4:
 - Undiagnosed vaginal bleeding which is suspicious for a serious condition, before evaluation.
 - UKMEC 3:
 - Uterine [fibroids](#) or other uterine abnormality such as a bicornuate uterus with distortion of the uterine cavity.
-

Gynaecological cancers

- UKMEC 4:
 - Endometrial cancer.
 - Cervical cancer awaiting treatment.
 - Gestational trophoblastic disease which is malignant or has persistently elevated hCG levels.
- UKMEC 3:
 - Cervical cancer after radical trachelectomy.
 - Gestational trophoblastic disease.
- Malignant trophoblastic disease.

Adverse reactions to copper

Copper allergy or [Wilson's disease](#) do not feature in the UKMEC, but they are listed as contraindications in the SPCs of many Cu-IUDs and the FSRH guidance on intrauterine contraception says that the Cu-IUD is not recommended in those with Wilson's disease or an allergy or sensitivity to any components of the device.

Other factors

- UKMEC 3:
 - Known long QT syndrome (due to the increased risks of a cardiac event if there is a vasovagal reaction and bradycardia - fitting in hospital should be considered).

Relative contra-indications - UKMEC 2 (benefits usually outweigh risks):^[7]

- Age under 20 (due to a small increased risk of expulsion).
- At the time of a second trimester abortion (due to a small increased risk of expulsion).
- Uncomplicated organ transplant.
- Complicated valvular and congenital heart disease (eg, pulmonary hypertension or a history of subacute bacterial endocarditis). A woman who is on review only annually and is asymptomatic with no cardiac medication would generally be considered to have uncomplicated disease, but if in doubt, discussion with the patient's cardiologist would be sensible.
- Cardiomyopathy with impaired cardiac function.
- Heavy or prolonged bleeding, endometriosis or severe dysmenorrhoea (these conditions may worsen with use of a Cu-IUD - a LNG-IUD would be a better choice to improve symptoms).
- Uterine abnormalities without distortion of the uterine cavity, for example cervical stenosis or laceration.
- Current infections not listed above (eg, hepatitis, *Trichomonas vaginalis*, other infective vaginitis or bacterial vaginosis).
- Being at an increased risk for STIs (the UKMEC does not define who is at increased risk).
- HIV with a CD4 count > 200 cells/mm³.
- Thalassaemia.
- Sickle cell disease.
- Iron deficiency anaemia.

Insertion at the time of termination of pregnancy

- Insertion during surgical termination of pregnancy is safe and practical. It can often be a convenient time to perform the procedure and avoids discomfort. Expulsion rates are marginally increased.

Special groups^[4]

Adolescents and those who have never been sexually active

- The available evidence suggests that IUDs are safe, effective and acceptable for adolescents, although expulsion rates and rates of painful or difficult insertions may be higher than in older women.
- There is no increased rate of adverse effects, early discontinuation or pregnancy in adolescents compared to older women.
- Fitting may be more challenging in those who have never been sexually active, but the FSRH guidance advises that it appears to be well tolerated.

Nulliparous women

- The Cu-IUD is a recommended form of contraception for nulliparous women.
- Nulliparous women have, on average, a shorter endometrial cavity length – the minimum cavity length for each device should be considered if this is an issue.
- There is no increased risk of expulsion in nulliparous women compared to those who have given birth, but there is an increased risk of difficult or painful fitting.

Trans men and those with a gender identity other than female

- Testosterone, as used for gender transition, is not contraceptive and may be teratogenic – for those who wish to avoid hormones, the Cu-IUD may be a useful contraceptive method, although use may be limited by heavier periods which can trigger a worsening of gender dysphoria. For this reason the LNG-IUD is more commonly used, as amenorrhoea is often welcome.
- Genital examination and IUD fitting may trigger worsening gender dysphoria; an experienced member of staff should carry out such a fitting.

Complications^[4]

For complications associated directly with the insertion process, including perforation, expulsion and lost threads, see the separate [Intrauterine Contraceptives \(IUD and LNG-IUD\) – Management](#) article.

Altered or abnormal bleeding

- Prolonged, heavier and more painful periods are common after insertion of a Cu-IUD, and are the most common reason for discontinuation of the device.
- For women using an IUD, non-steroidal anti-inflammatory drugs can be used to treat spotting, light bleeding or prolonged menses. Thrombolytics such as tranexamic acid may be used for menorrhagia.
- Heavy bleeding should make the clinician consider the possibility of early pregnancy at the time of insertion.
- Menstrual bleeding and pain are the most common reasons for early discontinuation of intrauterine contraception.
- As always, bleeding which has an abnormal pattern or seems worse than that usually associated with an adverse effect of a contraceptive, should be investigated for a pathological cause.

Pelvic infection

- This is most strongly related to the insertion procedure and to the background risk of STIs.
- The risk of pelvic infection is increased in the first 3 weeks after insertion, but remains low (<1%).
- If pelvic infection is suspected in a woman using any type of IUD then antibiotics should be started.
- The device does not need to be removed unless symptoms fail to resolve within 72 hours; if this is necessary then the possibility of pregnancy should be considered if there has been intercourse in the last 7 days – emergency contraception and a follow-up pregnancy test may be needed.

- Women should be followed up and their partners treated where appropriate. Sexual health risk assessment and counselling should be offered.

Actinomyces-like organisms

- Actinomyces-like organisms (ALOs) are commensals of the female genital tract and have been identified in women with and without intrauterine contraception.
- Their role in infection in women using intrauterine contraception is not clear.
- If ALOs are seen on a swab or smear, removal of the device is not indicated if the woman is asymptomatic. This incidental finding on a smear test has become much less common since the advent of primary HPV testing and the use of liquid-based cytology.^{[4] [8]}
- If symptoms of pelvic pain occur in conjunction with the presence of ALOs, other causes of infection should be considered and removal of the device may be advisable, possibly after discussion with local microbiology or gynaecology teams. If it is removed then it should be sent for culture and appropriate antibiotics given, depending on local protocols.

Pregnancy

- Ectopic pregnancy must be excluded although most pregnancies will be intrauterine.
- Ectopic pregnancy is increased relative to normal pregnancies where copper devices are used. However, the absolute risk of an ectopic pregnancy is greatly reduced, because the absolute risk of any type of pregnancy is reduced.
- Women who become pregnant must be counselled regarding the increased risk of miscarriage, infection and preterm delivery if the device remains in situ, and that removal reduces these outcomes but is associated with a small risk of miscarriage.

- If threads are visible or retrievable in the endocervical canal, the device should be removed up to 12 weeks of gestation. There is little evidence on the management of those who are more than 12 weeks gestation or do not have visible threads – decisions should be made by the obstetric team on a case by case basis.
- If not removed, the device should be sought at delivery or termination and, if not detected at this time, an abdominal X-ray performed to ensure it is not extrauterine.

Removal and return of fertility

Evidence suggests that the IUD does not delay return to fertility after removal.

Where pregnancy is desired

The IUD can be removed at any time.

Where pregnancy is not desired

- The IUD should be removed with menstruation or, if there has been no unprotected sexual intercourse in the previous seven days, at other times – if this is not possible, consider the need for emergency contraception.
- Where the IUD is to be exchanged, intercourse should be avoided for the previous seven days in case re-insertion fails.
- Where removal is at the end of the licensed duration use: remove at any time in the menstrual cycle. If pregnancy is to be avoided, remove in the first few days after the onset of menstruation or advise condoms or abstinence from sexual intercourse for at least seven days before the procedure in case re-insertion is not possible.
- When switching to combined hormonal contraception (CHC), remove after seven consecutive days of effective CHC use, or if starting CHC on the day of removal, use condoms for the first 7 days after the switch. ^[9]
- When switching to the depot or implant progestogen methods, remove the IUD after seven days of use of the new method.

Postmenopausal removal

If inserted after the age of 40 years, the IUD can continue to be used and will remain effective for contraception until the menopause is confirmed.

Summary of main points

	IUD
Method of action	Inhibits sperm mobility, prevents fertilisation and inhibits implantation.
Duration of action	5-10 years if contains 380 mm ² copper. If inserted at age 40 or over, will work until the menopause even if that is longer than 10 years
Failure rate	0.8% per year. [10] Only the LNG-IUD, the implant and sterilisation have a lower failure rate.
Risks	PID incidence is less than 1% if there is low risk for STI. Perforation incidence is less than 1 - 2 per 1,000 for most women but is increased if the woman is breastfeeding. [4] Ectopic pregnancy risk is 1 in 20, if pregnant with IUD in situ.
Effect on menses	Increased menstrual loss and dysmenorrhoea.
Return to fertility	No delay.
Advice given at fitting	Pain and discomfort last a few hours, followed by light bleeding for a few days. Watch for signs of perforation. No routine follow-up is needed, but the woman should return if she has signs suggestive of infection, cannot feel the threads, or has other concerns.

Dr Mary Lowth is an author or the original author of this leaflet.

Dr Hazell was the eLearning fellow on the current RCGP eLearning course on contraception, which was developed in partnership with Public Health England and the Faculty of Sexual and Reproductive Healthcare. She is the chair of the RCGP women's health library, which involves liaison with the FSRH. She has written and spoken on contraception on multiple occasions - some of these engagements were funded by pharmaceutical companies which may make copper intrauterine devices.

Further reading

- [IUD/IUS](#); Lothian Sexual Health

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