Copper IUDs

Advanced slide kit complementing the WHO training tool www.fptraining.org
Contents

To enable teachers to understand and explain:

- Mechanism of action
- Efficacy, duration of use
- Side effects: harmless, harmful, frequency
- Treatment of side effect
- Contraindications
- Misconceptions
- Counseling
- Risk of ectopic pregnancy
- Copper ball and expulsion
The contraceptive action of all IUDs is mainly in the uterine cavity. The major effect of all IUDs is to induce a local inflammatory reaction in the endometrium whose cellular and humoral components are released into the uterine cavity.

In humans, copper ions released from copper IUDs enhance the inflammatory response and reach concentrations in the luminal fluids of the genital tract that are toxic to spermatozoa and embryos. In women using the IUD, the entire genital tract seems affected, at least in part because of luminal transmission of the fluids that accumulate in the uterine lumen. This affects the function or viability of gametes, decreasing the rate of fertilisation and lowering the chances of survival of any embryo that may be formed, even before it reaches the uterus.

Studies on the recovery of eggs from women using IUDs and from women not using contraception show that embryos are formed in the tubes of IUD users at a much lower rate compared with non-users. This is believed to be the major action of IUDs. Therefore, the common belief that the main mechanism of action of IUDs in women is through destruction of embryos in the uterus (i.e. abortion) is not supported by the available evidence.

In copper IUD users, it is likely that few spermatozoa reach the distal segment of the fallopian tube, and those that encounter an egg may be in a poor condition. Thus, the few eggs that are fertilised have little chance of development and their possibility of survival in the altered tubal milieu become worse as they approach the uterine cavity.


Thirty-five trials included 18 comparisons of 10 different IUDs in approximately 48,000 women. The TCu380A was more effective in preventing pregnancy than the MLCu375 (rate difference [RD] 1.7%, 95% CI 0.07–2.95% after 4 years of use). The TCu380A was also more effective than the MLCu250, TCu220 and TCu200. There tended to be fewer pregnancies with the TCu380S compared with the TCu380A after the first year of use, a difference which was statistically significant in the fourth year (RD −1.62%, 95% CI −3.00% to −0.24%). This occurred despite more expulsions with the TCu380S (RD 3.50%, 95% CI 0.36–6.63% at 4 years). The MLCu375 was no more effective than the TCu220 at 1 year of use, or than the MLCu250 and NovaT up to 3 years. Compared with the TCu380A or TCu380S, none of the IUDs showed any benefits in terms of bleeding or pain or any of the other reasons for early discontinuation. None of the trials that reported events at insertion found one IUD easier to insert than another or caused less pain at insertion. There is no evidence that uterine perforation rates vary by type of device. There are minimal randomised data on IUD use in nulliparous women.

We conclude that the TCu380A and TCu380S appear to be more effective than other IUDs. No IUD showed consistently lower removal rates for bleeding and pain in comparison with other IUDs. There is no evidence that any particular framed copper device is better suited to women who have not had children.


We included 35 trials, resulting in 18 comparisons of 10 different IUDs in approximately 48,000 women. TCu380A was more effective in preventing pregnancy than MLCu375 (RD 1.70%, 95% CI 0.07–2.95% after 4 years of use). TCu380A was also more effective than MLCu250, TCu220 and TCu200. There tended to be fewer pregnancies with TCu380S compared to TCu380A after the first year of use, a difference which was statistically significant in the fourth year (RD −1.62%, 95% CI −3.00% to −0.24%). This occurred despite more expulsions with TCu380S (RD 3.50%, 95% CI 0.36–6.63% at 4 years). MLCu375 was no more effective than TCu220 at 1 year of use, or MLCu250 and NovaT up to 3 years. Compared to TCu380A or TCu380S, none of the IUDs showed any benefits in terms of bleeding or pain or any of the other reasons for early discontinuation. None of the trials that reported events at insertion found one IUD easier to insert than another or caused less pain at insertion. There is no evidence that uterine perforation rates vary by type of device. There are minimal randomized data on IUD use in nulliparous women.

Conclusions
TCu380A and TCu380S appear to be more effective than other IUDs. No IUD showed consistently lower removal rates for bleeding and pain in comparison to other IUDs. There is no evidence that any particular framed copper device is better suited to women who have not had children.
To compare the contraceptive efficacy of various types of intrauterine method (copper IUD, Nova-T, LNG-IUS), all relevant publications on the subject published over the last two decades were reviewed. The first point to be highlighted by the review is the excellent effectiveness of intrauterine contraception, with a global cumulative pregnancy rate <2% at 5 years, whatever type of device is used. We observed a large variation in efficacy rate according to the type of device and also according to the study design. Nevertheless, of all types of device, the LNG-IUS and, to a lesser extent, the TCu380A IUD seem to be the most effective, with a cumulative pregnancy rate at 5 years of <0.5% for the LNG-IUS and between 0.3% and 0.6% for the TCu380A IUD.

The study set out to determine risk factors affecting the incidence of IUD insertion-related complications and failures, and, in particular, whether postcoital IUD insertions had a higher incidence of complications compared with routine IUD insertions.

The study examined 545 case notes of patients having IUD insertions at East Cheshire NHS Trust family planning clinics between 1 October 1997 and 31 December 2000. The incidence of complications at insertion, or up to 12 weeks after insertion, was determined and included failed insertion, cervical problems, syncope, bradycardia, convulsions, early perforation and early expulsion. Fourteen potential risk factors were examined to determine the effect on incidence of complications.

Failed insertions were statistically more likely in women who had never previously had a vaginal delivery and also when a less experienced doctor performed the insertion. Nulliparous women were at a statistically increased risk of cervical problems and bradycardia. Cervical problems at insertion also increased significantly with age. Patients who were amenorrhoeic at insertion were more likely to suffer early IUD expulsion.

Of the potential risk factors, nulliparity was the most important. IUD insertion failures and complications were no more common in postcoital than routine IUD insertions. In general, complications were unpredictable, indicating the need for constant vigilance and the inserting doctor being trained and prepared to deal with any complication arising.


For patients with cramping, perform abdominal and pelvic (speculum and bimanual) examinations to check for pelvic inflammatory disease (PID) and other causes of cramping, such as partial expulsion of the intrauterine device (IUD), cervical or uterine perforation, or ectopic pregnancy. If no cause is found but cramping is severe, remove the IUD. If there is no evidence of infection, replace with a new IUD (progestin-releasing, if available) or help client choose another method. If no cause is found and cramping is not severe, reassure the client and provide an analgesic, such as ibuprofen.

When a patient has heavy bleeding (twice as long or twice as much as normal), perform a pelvic examination (speculum and a bimanual) to ensure that the patient does not have an intrauterine or ectopic pregnancy, an incomplete abortion, or a vaginal, cervical or pelvic infection. Check for signs of marked anemia (i.e., pale conjunctiva or nail beds, a low hemoglobin (< 9 g/dL) or a low hematocrit (< 27 Hct). If the examination is normal, reassure the patient and prescribe iron (FeSO4) tablets (1 tablet containing at least 100 mg of elemental iron to be taken once daily for 1 to 3 months). Ask the patient to return in three months for another checkup. Recommend that the patient take nonsteroidal anti-inflammatory agents during bleeding episodes to decrease the bleeding.

If the examination is normal and the bleeding interval is short (<3 weeks), suspect anovulation. If the intervals are longer (>6 weeks), suspect delayed ovulation. If the patient is experiencing hot flashes, suspect menopause (if ≥45 years of age) or another gynecologic endocrine problem and refer her to an appropriate specialist for further evaluation. If a bimanual examination shows an enlarged or irregular uterus because of fibroids, refer the patient for evaluation.
Remove the IUD if the bleeding worsens and the patient becomes anemic or requests removal. Help the patient choose another contraceptive method. If the patient has had the IUD in place more than three months and has marked anemia, recommend that the device be removed. Help the patient choose another contraceptive method.
The 48 and 60 month continuation rates of the LNG-IUS and copper IUD were compared among women enrolled in the Contraceptive CHOICE Project. The primary outcome was continuation at 48 months. CHOICE is a prospective cohort study of women who received an IUD through CHOICE. Women who had either an LNG or a copper IUD inserted between January 2008 and June 2009 were randomly selected and contacted by telephone. Once contacted and consented, they were asked whether they were still using their intrauterine method. Women who reported discontinuation were asked for the reasons and subsequent contraceptive use. Survival analysis using Cox proportional hazards was performed to assess for factors associated with discontinuation and to calculate hazard ratios.

Of the 460 women contacted, 321 (70%) were reached for interviews. Continuation data on the remaining 139 women were available from CHOICE and its substudies. Continuations at 48 and 60 months were 62.3% and 51.7% for the LNG-IUS and 64.2% and 55.9% for the copper IUD, respectively. Continuation at 48 months was highest among women older than 29 years of age at insertion (LNG-IUS, 72.5%; copper IUD, 77.1%). Women younger than 24 years of age had the lowest 48 month continuation (LNG-IUS, 55.4%; copper IUD, 53.2%). In univariable and multivariable analyses, demographic characteristics, menstrual profile and pregnancy history were not associated with discontinuation. Age older than 29 years was associated with less discontinuation than age 24–29 years (hazard ratio 0.67, 95% CI 0.47–0.96).

Continuation of intrauterine contraception remains high (>60%) at 48 months with no difference between the copper IUD and the LNG-IUS.


The IUD is not indicated during pregnancy and should not be used because of the risk of serious pelvic infection and septic spontaneous abortion.

- **Immediate postpartum Cu-IUD insertion**, particularly when insertion occurs immediately after delivery of the placenta, is associated with lower expulsion rates than **delayed postpartum insertion**.
- Additionally, **post-placental placement at the time of caesarean section** has lower expulsion rates than post-placental vaginal insertions. Insertion complications of perforation and infection are not increased by IUD placement at any time during the postpartum period.
- IUDs can be inserted **immediately after first-trimester**.
- **Severe thrombocytopenia** increases the risk of bleeding. In women with very severe thrombocytopenia who are at risk for spontaneous bleeding, consultation with a specialist and certain pre-treatments may be warranted.
- Among women who have an IUD inserted, the absolute **risk of subsequent symptomatic PID** was low among women with STI at the time of insertion but greater than among women with no STI at the time of IUD insertion (101–108).
- IUD insertion may further increase the risk of PID among **women at increased risk of STIs**, although limited evidence suggests that this risk is low.
- Current algorithms for determining increased risk of STIs have poor predictive value. **Risk of STIs varies by individual behaviour and local STI prevalence.** Therefore, while many women at increased risk of STIs can generally have an IUD inserted, some women at increased risk (very high individual likelihood) of STIs should generally not have an IUD inserted until appropriate testing and treatment occur.
Rumors and misconceptions about IUDs

Clarify misconceptions:
- Rarely lead to PID
- Do not increase risk of STIs, including HIV
- Do not work by causing abortion
- Do not make women infertile
- Do not move to the heart or brain
- Do not cause birth defects
- Do not cause pain for women or men during sex
- Significantly reduce risk of ectopic pregnancy
Key counseling topics for copper IUD users

A detailed guidance to counseling before IUD insertion can be found in the

WHO, Technical Resource Package for Family Planning Contraceptive IUD Module

https://www.fptraining.org/projects/intrauterine-devices-iuds
### Counseling topics for Copper IUD users

**Side effects and STI prevention**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Side-effects</strong></td>
<td>Side-effects like bleeding problems or pain usually improve after first 3 months.</td>
</tr>
<tr>
<td><strong>Protection against STIs or HIV/AIDS</strong></td>
<td>The copper-IUD does not provide protection against STIs/HIV For STI/HIV and AIDS protection, also use condoms.</td>
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These data from the Oxford Planning Association Study demonstrate the conception rates of more than 17,000 women between the ages of 25 and 39 years who stopped using a contraceptive to plan a pregnancy. All the contraceptive methods used by the study participants were associated with a decreased rate of pregnancy after 12 months. When contraception use was halted, the conception rate reached approximately 80% by 18 months for all women and for all contraceptive methods. The results of this study suggest that women who have an IUD removed to plan a pregnancy do not experience prolonged infertility in comparison with women who use and then stop using other contraceptive methods.

Comment: This study from 1983 does not indicate that copper IUDs might have a negative impact on fertility in women aged 25–39 years. However, the incidence of chlamydial infections in women has increased dramatically from 79 to 467 per 100,000 between 1987 and 2003. According to the WHO, 101 million chlamydial infections are detected annually worldwide. This should be taken into consideration when discussing the results (Ref 2).

This slide displays the results of a study estimating risk of ectopic pregnancy for copper IUD users, for users of other contraceptive methods, and for women who do use any contraceptive method. If a pregnancy does occur in an IUD user, the risk of it being an ectopic pregnancy is slightly higher than in women using other methods. However, because the IUD is very effective in preventing pregnancy, the overall number of ectopic pregnancies is lower among users of the copper T IUD than among women who use other contraceptives, and much lower compared with women who use no method of contraception.
1. Wiebe, E. et al.: Discontinuation rates and acceptability during 1 year of using the intrauterine ball (the SCu380A. Contraception 2016; 364-6