THE INTRA-UTERINE DEVICE

WHY CONSIDER THIS METHOD?

Use of an IUD should be considered for all women who seek a reversible, effective, coitally-independent method of contraception. It is particularly appropriate for family spacing or in women who are considering long-term contraception.

HOW DOES IT WORK?

The primary action of all IUDs is the induction of a foreign-body reaction within the endometrium. This sterile inflammatory process is toxic to gametes, primarily spermatozoa, and effectively prevents viable sperm from passing into the Fallopian tubes. The copper-bearing devices have an independent toxic effect on spermatozoa. Only copper-bearing IUDs are marketed in Canada.

The progesterone- and progestin-releasing devices produce a decidual reaction in the endometrium and promote glandular exhaustion, reducing the potential for implantation of a zygote. The progestin effect on cervical mucus reduces the penetrability of sperm. These devices are not currently marketed in Canada.

WHAT ARE THE PROS AND CONS?

The IUD is especially suited for:

1. women who seek a reversible, effective, coitally-independent method of contraception;
2. women seeking a private form of contraception (this may require that the IUD strings are removed or cut short);
3. women who are concerned that they may not remember to use a daily method;
4. women who are considering sterilization;
5. following delivery or abortion;
6. women who are breastfeeding;
7. women who cannot use a hormonal method of contraception.

The recognized contra-indications for use of an IUD are as follows:

a) Absolute

1. Pregnancy or possible pregnancy.
2. Current pelvic inflammatory disease (PID), cervicitis, bacterial vaginosis, or chlamydial or gonococcal genital infection.
3. Lifestyle with increased risk of STD.
4. Known allergy to any constituent of the device.
5. Wilson's disease (copper devices).
6. Conditions leading to increased susceptibility to infection, especially AIDS, leukaemia, IV drug abuse.
7. Undiagnosed irregular genital tract bleeding.
8. Immunosuppressed individuals.

b) Relative

1. Valvular heart disease.
2. Past history of PID.
3. Presence of a prosthesis potentially at risk with blood-borne infection (e.g. hip).
4. Abnormalities of the uterus resulting in a distorted cavity or a cavity that sounds to less than 6.0cm.

FIGURE 1

IUDs—GYNE-T380 AND NOVA-T

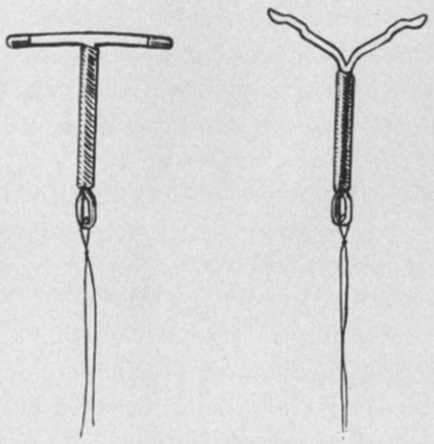

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TABLE 1
PERFORMANCE OF VARIOUS INTRA-UTERINE DEVICES

Device	Cumulative pregnancy rate at one year	Removal for bleeding or pain at one year	Continuation rate at one year
Cu-T380	0.3–1.0%	1.6–14.2%	79.8–90.9%
Nova-T	0.8–2.0%	7.5–11.9%	76.1–82.2%
Levonorgestrel-releasing devices	0.0–0.2%	8.7–13.8%	73.5–79.7%

References 1, 2, 3-10.

5. History of ectopic pregnancy.
6. Severe primary dysmenorrhoea.
7. Menorrhagia.
8. Cervical stenosis.
9. Uterine fibroids or congenital uterine anomaly.

The risks currently associated with IUD use are as follows:

a) Uterine perforation

Perforation occurs, partially or completely, at the time the device is inserted. The perforation rates for devices available in Canada are approximately 0.6 incidents per 1,000 insertions.[11] Perforation is more likely to occur when the device is inserted post-partum. Post-partum insertion of an IUD should be performed cautiously, and preferably by an experienced inserter.

An IUD which has partially or completely perforated the uterine wall must be removed. Even partial perforation will reduce the contraceptive effectiveness of the device.

b) Pain and abnormal bleeding

At one year after insertion, five to 15 percent of IUD users will have had the device removed because of increased menstrual pain or bleeding.[11,12] This combination of symptoms may be a physiological uterine response to the presence of the device, but may also indicate the presence of a pregnancy complication (ectopic pregnancy, spontaneous abortion), pelvic infection or mal-positioning of the device, including perforation. Each of these possibilities must be considered.

Measured blood loss in women with IUDs indicates that the volume of uterine bleeding is reduced in women using a progesterone- or progestin-releasing device, but in copper-bearing devices it will increase by 50 to 100 percent over non-users.[13] The increased blood loss typically occurs because of increased duration and heaviness of menstrual flow, but may also result from intermenstrual bleeding and spotting.

c) Pelvic inflammatory disease

Of the five risk factors for PID examined in the Women's Health Study in 1981,[14] use of an IUD was the weakest, with an odds ratio of 1.6. More powerful risk factors were multiple sex partners, frequent coitus, young age (less than 25 years) and black race.

Further analysis of the Women's Health Study data showed the significance of duration of use of the IUD in risk for PID.[15] This analysis showed a statistically significant increase in risk for PID in women whose use of their current IUD was four months or less. The relative risk of PID was 3.8 in the first month after insertion, reaching baseline risk after four months and remaining unchanged thereafter. Bacteriologic studies of the endometrial cavity showed that it was contaminated by the insertion of an IUD, but soon afterwards the cavity had sterilized itself. Whether or not the IUD had a string did not affect the probability of developing PID.

A further reanalysis of the data from the Women's Health Study (1991) yielded a relative risk for PID of 1.02 for current IUD users, compared with women using no contraception; this study concluded that IUD use did not increase the risk of PID.[16]

The recent findings can be summarized as follows:[17]

1. **Pelvic inflammatory disease related to IUD use is limited to the first few months of use; IUD-related PID is rare beyond 20 days after insertion.[18]**
2. **Exposure to STDs is responsible for an increased risk of PID, rather than the use of an IUD. Use of an IUD in low-risk women (particularly those in stable, mutually monogamous relationships) essentially carries no added risk of PID.**

Colonization of an IUD with actinomycosis-like organisms is usually detected through cervical cytology. After five years of continuous use of an IUD, more than 20 percent of cervical smears may show evidence of the organism.[19] Frank actinomycotic infection is potentially life-threatening. Demonstration of the organism in the cervical smear of a woman with an IUD raises the possibility of serious pelvic infection, and usually warrants removal of the device and appropriate follow-up.

d) Infertility

Most women who discontinue use of an IUD in order to conceive do so at the same rate as women who

have never used an IUD. However, the association between insertion of an IUD and increased risk of PID raises concerns about possible tubal factor infertility occurring after IUD use. It is unclear how often PID leads to tubal factor infertility.

Cohort studies indicate that, of women discontinuing IUD use, 72 to 96 percent of women conceive within one year of IUD removal, and up to 51 percent actually deliver within one year of removal.[20] Such rates are comparable to those in women who have never used contraception.

e) Pregnancy complications

When a pregnancy occurs with an IUD *in situ*, the risk of spontaneous abortion is increased. The 1989 study from the UK Family Planning Research Network[21] indicated that 75 percent of pregnancies aborted if the IUD remained *in situ*; this figure was significantly reduced if the IUD was removed, with 89 percent of these women having a live birth. A pregnant woman who retains an IUD has a two-fold to four-fold increase in the risk of delivering prematurely.[22,23] There appears to be no increase in the rate of congenital anomalies in the offspring of women who continue through pregnancy with an IUD *in situ*.

f) Ectopic pregnancy

International studies suggest that women using an IUD have between one-half and one-fifth of the risk of ectopic pregnancy faced by a woman using no contraception.[24] This translates into an incidence in IUD users of less than 1.5 ectopic pregnancies per 1,000 woman-years of use.[25] Nevertheless, a woman who conceives with an IUD in place should have a diagnosis of ectopic pregnancy excluded.

WHAT ARE THE OPTIONS?

There are three IUDs currently marketed in Canada. These are the Nova-T®, the Gyne-T® and the Gyne-T 380 Slimline®.

WHAT ARE THE PREREQUISITES FOR THE USE OF THIS METHOD?

The woman who decides to use an IUD must first be screened for contra-indications and for suitability of the method. All candidates for IUD insertion ideally should be screened for STDs, particularly Chlamydia and bacterial vaginosis, at a previous visit, so that the results of such screening are known before the insertion is performed. If this is not possible or available, the cervix must be carefully inspected, and the uterus and adnexal regions palpated before undertaking IUD insertion. If there is any mucopurulent discharge or pelvic tenderness present, then cervical swabs should be taken for STD screening, and the insertion delayed until the results are known.

Bimanual pelvic examination also serves to determine the size, position and regularity of the uterus. It is prudent also to sound the uterus before IUD insertion, to determine the depth of the endometrial cavity, the direction and patency of the canal and to rule out any major distortions within the cavity.

Timing of Insertion

a) Post-partum

Compared with interval insertion, the insertion of an IUD in post-partum women has been associated with higher rates of expulsion and uterine perforation.[17] The optimal time for insertion after delivery remains unclear; insertion at any time after delivery of the placenta is an option, although devices are most commonly inserted at the four to six week post-partum check.

b) Post-abortion

An IUD can be safely inserted into the uterus following completion of a therapeutic abortion.

c) Interval

Insertion of an IUD can be done at any time in the menstrual cycle, as long as pregnancy is excluded.

IMPLEMENTATION STEPS

A vaginal speculum is inserted and the cervix visualized. Even if the cervix appears entirely clean and healthy, it must be vigorously cleansed, with the aim of removing mucus from the external os. A cotton-tip applicator soaked in an aqueous antiseptic solution should be used in the lower part of the cervical canal.

Local anaesthetic (e.g. lidocaine 1%) is injected into the anterior lip of the cervix, prior to application of a tenaculum, and it can also be used to establish a paracervical block, particularly in nulliparous women.

The tenaculum is applied to the anterior lip of the cervix, and gentle traction is applied to straighten the cervical canal. The uterus is sounded. The IUD is then loaded into the barrel of the inserter, using sterile technique and following the manufacturer's recommended method. The device is loaded only as far as needed to allow insertion. The strings on the tail of the device should trail down the

inside of the barrel and be accessible through the opposite end. The flange on the outside of the barrel is adjusted so it indicates the depth of the uterine cavity (measured by the sound) to which the IUD should be inserted. The long axis of the flange must correspond to the horizontal plane in which the arms of the device will open.

Steady traction is applied to the tenaculum. The tip of the inserter barrel is directed into the cervical canal and passed gently to the fundus of the cavity. The flange should abut the cervix. The device is then expelled from the barrel using a "pull" or "push" technique; it is important to follow the directions of the package insert at this stage. The barrel is removed, leaving the IUD in the uterine cavity and allowing the strings to trail through the cervix.

The strings are clipped at a distance of approximately 2.5cm from the external os, in order to facilitate removal of the device.

The woman will be aware before the device is inserted that there may be cramping and some bleeding immediately after insertion.

An initial visit should be scheduled for three months after insertion. This will allow for the exclusion of infection, an assessment of menstrual symptoms and a check of positioning of the device. The woman should be advised to seek medical attention thereafter if she has delayed menses (to rule out pregnancy), if she has unusual pelvic pain or bleeding (to rule out infection, ectopic pregnancy or a pregnancy complication), if her partner complains of pain during intercourse or if the device is expelled. There is ordinarily no need for her to check for the strings after each period or before intercourse.

As for any sexually active woman, an IUD user should have at least annual pelvic examinations and Pap. smears.

TROUBLESHOOTING

a) Lost strings

If the strings are not seen in the cervical os, the device may have been expelled or may have perforated the uterine wall. Alternatively, the strings may have been drawn up into the cervical canal. This can be caused by an intra-uterine pregnancy.

The first step is to rule out pregnancy. If pregnancy is confirmed, management is directed towards this. Once pregnancy is excluded, the cervical canal should be explored (with Q-tip swab, Cytobrush, uterine dressing forcep or a similar instrument) to see if the strings can be found.

If the strings are not found, a pelvic ultrasound should be done to identify whether the IUD is inside or outside the uterus. If the device is seen within the uterus, it can be left *in situ*. If the device is not identified within the uterus or in the pelvis, and there is no history to suggest expulsion, a plain X-ray of the abdomen will identify whether or not the device may have perforated the uterine wall and migrated within the abdomen. The devices are radio-opaque.

b) Pregnancy with IUD in place

The possibility of ectopic pregnancy must be excluded.

The woman will be asked about her wishes for the pregnancy. If she wishes to terminate the pregnancy, the IUD can be removed or left in place until that procedure. If she wishes to continue with the pregnancy, she should be advised that there is an increased risk of miscarriage regardless of what is done, but that the risk is lower if the device is gently removed. If the strings are visible, gentle traction is applied to remove the device.

If the strings are not visible, gentle exploration of the cervical canal is performed. If no strings are found, the possibility of perforation must be considered. This is best excluded by pelvic ultrasound. If the device remains in the uterus, ordinarily no attempt is made to remove it. Note must be made of its recovery at the time of delivery.

c) Amenorrhoea or delayed period

Pregnancy must be excluded. If the woman is not pregnant, her amenorrhoea should be managed as for a woman without an IUD. If she is post-menopausal, the device should be removed.

d) Pain and abnormal bleeding

If pain or abnormal bleeding persists after insertion of an IUD, it is usually best to remove the device. If the woman wants to leave the device in place, it is important to rule out infection and complications of pregnancy as underlying causes. If these are excluded, the use of NSAIDs will reduce the volume of menstrual bleeding by up to 40 percent[26] and will reduce prostaglandin-induced pain.

e) The IUD cannot be removed (traction on strings causes excessive discomfort, or strings pull off)

If the woman wishes to conceive, she will need to have the device removed. This will usually require hysteroscopy and removal under direct vision. If she has no wish to conceive, and the device is inside the uterus, it can be left in place; but if it has perforated the uterine wall, it must be removed surgically.

f) **Chlamydial or gonococcal cervicitis** identified with an IUD *in situ*.

Antibiotic therapy for the woman and for any sexual contacts must be initiated immediately. If there is any suggestion of PID (pelvic tenderness), the device must be removed, and it should also be removed in any woman planning further pregnancies. Individual judgement can be applied regarding removal of the device in cases where a woman has completed her family. She should be counselled regarding the use of barrier contraceptive methods.

g) **Pap. smear demonstrates actinomyosis-like organisms**

As described above, there is potential for these organisms to cause PID. Optimal management is to remove the device, send it for culture and institute antibiotic treatment (usually penicillin).

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