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**Review Article.....!!!**

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## **INTRAUTERINE DRUG DELIVERY SYSTEM: A REVIEW**

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Intrauterine Device,  
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### **ABSTRACT**

An Intrauterine Device (IUD) is a small piece of plastic that is inserted by a clinician into the uterus to prevent pregnancy. It is approximately 1.1/2 inches (3cm) in length. There are several different types of IUDs. The most common IUD is T-shaped and coated with copper. This can be left in the uterus for 2-5 years. Another type of IUD contains a hormone (progestin) but it needs to be replaced once a year. Attached to the IUD are two plastic threads or strings that hang down through the cervix into the vagina. The cervix is the opening to the uterus. The threads or strings do not hang outside the body. The IUD can also be a good option for used as an emergency method of birth control. An IUD is highly effective, long-term, easily reversible method of women who want contraception. It can be an appropriate choice for women who can't use certain hormonal methods like birth control pills. An IUD won't protect you from sexually transmitted infections (STIs) and isn't recommended for women at high risk for STIs. The copper IUD may also be used for emergency contraception. If it's inserted within five days after unprotected sex, it's more effective than taking emergency contraceptive pills. Plus you can just leave it in for ongoing contraception. If an IUD is inserted within 7 days after unprotected vaginal sex it may

prevent a pregnancy.

An IUD is a small soft

T-shaped device with a

nylon string attached.

**INTRODUCTION:**

Intrauterine Device (IUD) is a small object that is inserted through the cervix and placed in the uterus to prevent pregnancy. A small string hangs down from the IUD into the upper part of the vagina. The IUD is not noticeable during intercourse. IUDs can last 1-10 years. They affect the movements of eggs and sperm to prevent fertilization

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The cervix is the opening to the uterus. The threads or strings do not hang outside the body. The IUD can also be used as an emergency method of birth control. If an IUD is inserted within 7 days after unprotected vaginal sex it may prevent a pregnancy. An intrauterine device (IUD) is a small T-shaped plastic device that is placed in the uterus to prevent pregnancy.

A plastic string is attached to the end to ensure correct placement and for removal. IUDs are an easily reversible form of birth control, and they can be easily removed. However, an IUD, should only be removed by a medical professional. An IUD, or intrauterine device, is a small contraceptive device made of flexible plastic. It's inserted into the uterus, where it provides highly effective long-term contraception.

Insertion of a copper-T IUD as emergency contraception is more than 99% effective, making it more effective than emergency contraceptive pills. The IUD is the world's most widely used safe and effective method of reversible birth control, currently used by nearly 160 million women. An Intrauterine Device (IUD) is a small object that is inserted through the cervix and placed in the uterus to prevent pregnancy. A small string hangs down from the IUD into the upper part of the vagina. The IUD is not noticeable during intercourse. IUDs can last 1-10 years. They affect the movements of eggs and sperm to prevent fertilization. They also change the lining of the uterus and

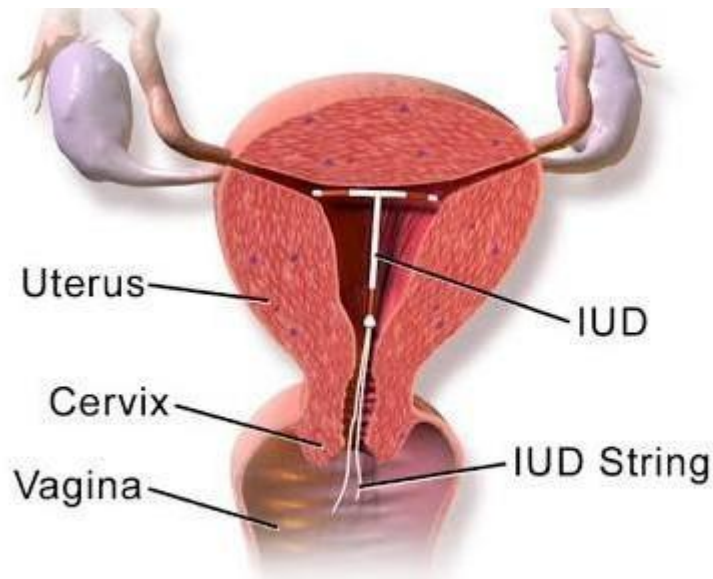
prevent implantation. IUDs are 99.2-99.9% effective as birth control. They do not protect against sexually transmitted infections, including HIV/AIDS. The IUD is 98% effective in preventing pregnancy.

### **Evaluation of device**

The purpose of this study was to evaluate a new device couples any standard transvaginal ultrasound transducer to a special tenaculum by means of a specially designed adaptor that enables real-time ultrasound imaging and guidance of intrauterine surgical procedures.

### **Study design**

Forty-five patients who underwent intrauterine surgical interventions were evaluated. Forty of these patients had pregnancy terminations. Three patients had curettage for early pregnancy complications. One patient had a polyp removed, and one patient underwent hysteroscopic submucous myomectomy. Five attending physicians performed 26 procedures. Four residents in training performed 19 procedures. All operators were instructed in the assembly and use of the device before their first procedure. Evaluation of the device was done by means of a detailed questionnaire.



### **Intrauterine Device (IUD)**

**The uterus is a pear shaped, thick-walled, muscular organ suspended in the anterior wall of pelvic cavity.**

In its normal state, it measures about 3 inches long and 2 inches wide.

Fallopian tubes enter its upper portion, one on each side, and the lower portion of the uterus projects into the vagina.

The uterine cavity is normally triangular in shape and flattened antero - posteriorly.

#### **SIDE EFFECTS AND COMPLICATIONS USING INTRAUTERINE DEVICES**

##### **Location of device:**

Following insertion, the IUS may be expelled through the cervix. An expulsion rate of 4% was observed in the manufacturer's clinical trials, with most (3%) occurring in the first year of use. Expulsion is more common in younger women, women who have not had children, and when an IUS is inserted immediately after childbirth or abortion

A rare but potentially serious complication is that of uterine perforation. This may occur either during the device's insertion, or from its later embedment into the myometrium (uterine wall) and subsequent migration through to the intra- abdominal

cavity. Perforation can cause internal scarring, infection, or damage to other organs, and may require surgery. Uterine perforation has been reported at rates ranging from 1 to 2.6 per 1000 insertions. It is believed that perforations are significantly under reported, however, and actual perforation rates are likely higher

Both expulsion and perforation result in loss of contraceptive cover and the position of the thread of the IUS should be self-checked at least once per IS menstrual cycle to verify that it is still in place, or, in the absence of menstrual cycles, once per month

The string(s) may be felt by some men during intercourse. If this is problematic, the provider may tuck the strings behind the cervix, cut the strings shorter, or in more extreme cases cut the strings to level with the cervix. Cutting the strings even with the cervix prevents the woman from checking the device's correct placement, and may complicate removal.

### **Pelvic inflammatory disease and sexually transmitted diseases**

Pelvic inflammatory disease (PID) is caused by certain sexually transmitted diseases (STDs). PID is a serious condition that may result in infertility. In women who have STDs, an IUD will increase the risk of PID. Therefore, IUDs are not recommended for women at high risk of STDs.

Women who have more than one sexual partner, or whose partners have more than one sexual partner, are at increased risk for STDs. Younger women are statistically at higher risk for STDs

An animal study suggested that progestin-only hormonal contraceptives such as Mirena might increase the risk of HIV transmission, because of the thinning of the vaginal walls caused by these methods.

However, a number of studies of human populations showed that progestin contraceptive use does not increase the risk of acquiring HIV.

However, like the oral contraceptive pill and other non-barrier forms of contraception, the IUS offers no protection against sexually transmitted disease.

### **Postpartum and post-abortion insertion**

An IUS may be inserted immediately postpartum (within 48 hours). With insertions after 48 hours, perforation of the uterus is more likely to occur when uterine involution is incomplete; involution usually completes by 4-6 weeks postpartum. Special considerations apply to women who plan to breastfeed. Also to allow for uterine involution, insertion of an IUS is not recommended for women who have had a D&E abortion (second-trimester abortion) within the past four weeks

To reduce the risk of infection, insertion of an IUS is not recommended for women who have had a medical abortion but have not yet had an ultrasound to confirm that the abortion was complete, or who have not yet had their first menstruation following the medical abortion.

Expulsion is more common when an IUS is inserted immediately after childbirth or abortion.

### **Hormonal side effects**

#### **Localized**

Menstrual periods become lighter, or, in about 20% of women, stop completely within one year of insertion. Irregular bleeding is common in the first few months after insertion, with the average user reporting 16 days of bleeding or spotting in the first month of use, but this diminishes to about four days at 12 months

#### **Systemic**

The progestin in an IUS is intended to be released at a lower dose than that used in other progestogen-only contraceptives such as the mini-pill or Norplant (blood levels of levonorgestrel in Mirena users are half those found in Norplant users and one-tenth those found in users of levonorgestrel-only pills).

Enlarged follicles (ovarian cysts) have been diagnosed in about 12% of the subjects using a levonorgestrel IUS. Most of these follicles are asymptomatic, although some may be accompanied by pelvic pain or dyspareunia. In most cases the enlarged follicles disappear spontaneously during two to three months observation. Surgical intervention is not usually required.

### **Effect on cancer rates:**

The U.S. Food and Drug Administration has concluded that the carcinogenic potential of Mirena is low. According to a 1999 evaluation of the studies performed on progestin-only birth control by the International Agency for Research on Cancer, there is some evidence that progestin-only birth control reduces the risk of endometrial cancer. The IARC concluded that there is no evidence progestin-only birth control increases the risk of any cancer, though the available studies were too small to be definitively conclusive. The use of progestin alone in treatment of menopause has been associated with a doubling of risk for breast cancer versus nonuse.

Because breast cancer cells are often hormone-sensitive, Mirena and other hormonal birth control methods are not recommended for women who have, have had, or suspect they have breast cancer.

**Pregnancy.** Although the pregnancy rate during IUS use may be low, it is not a 100% effective method of birth control. If pregnancy does occur, presence of the IUD increases the risk of miscarriage, particularly during the second trimester. It also increases the risk of premature delivery. These increased risks end if the IUD is

#### **ADVANTAGES**

1. Highly effective in preventing pregnancy.
2. Inexpensive.
3. Does not interrupt sex.
4. Does not require partner's involvement.
5. Can be used for a long period of time.
6. Can be used as an emergency method of birth control.
7. An IUD provides long-term contraception for 3 to 5 years and is cost-effective.
8. When you are ready to become pregnant, the IUD can be removed by a health-care provider.
9. It is convenient. You do not need to remember daily pills

#### **DISADVANTAGES**



1. Does not protect against sexually transmitted infections (STIs). If you get a sexually transmitted infection, the IUD could increase the likelihood of developing pelvic inflammatory disease (infection of the reproductive organs), which may lead to infertility
2. May increase the likelihood of ectopic pregnancy (pregnancy outside the uterus)
3. Can cause heavier and more painful periods
4. Cramping and discomfort during and 24-48 hours after insertion
5. There are risks during insertion and removal that your clinician should discuss with you before inserting an IUD.

### **LIMITATION**

Between 2 to 10 per cent of IUD'S fall out, most commonly in the first year of use.

There is an increased risk of falling out if :-

1. An IUD was inserted right after delivery
2. An IUD has fallen out previously
3. You have never been pregnant.

There is an increased risk of miscarriage if an IUD is left in the uterus during a pregnancy.

The risk of pelvic inflammatory disease (PID) may be increased slightly during the first month after an IUD inserted. After the first month the risk of STI is related to the exposure to STI, not the use of an IUD.

An IUD, in rare cases, may attach to or perforate the wall of the uterus.

The IUD may need to be removed through minor surgery

**Diagram:**



**Fig. 1: Intrauterine Device**

**Table 1: Marketed formulation**

Name	Hormone	Dose	Approved For
ParaGard	N/A (Use Copper)	N/A	10/12 Years*
Mirena	Levonorgestrel	20 mcg/day (52 mg in the device)	5/7 Years*
Liletta	Levonorgestrel	18.6 mcg/ day (52 mg total)	3/5 Years*
Kyleena	Levonorgestrel	17.5 mcg/day ( 19.5 mg total )	5 Years*
Skyla	Levonorgestrel	14 mcg/day (13.5 mg Total)	3 Year

## CONCLUSION:

An IUD is inserted into the uterus (womb) by a health-care provider with specialized training. An IUD prevents pregnancy by stopping sperm from reaching an egg that your ovaries have released. It does this by not letting sperm go into the egg. An IUD also changes the lining of the uterus so an egg does not implant in the lining if it has been fertilized. Therefore, the egg has no place to grow. An IUD prevents pregnancy by stopping sperm from reaching an egg that your ovaries have released. It does this by not letting sperm go into the egg. An IUD also changes the lining of the uterus so an egg does not implant in the lining if it has been fertilized. Therefore, the egg has no place to grow. A single decision leads to effective long-term prevention of pregnancy Increased sexual enjoyment because there is no need to worry about pregnancy. It can be inserted immediately after childbirth (except hormone releasing IUDs) or after induced abortion (if there is no evidence of infection). They are very effective and very little need be remembered. Copper IUDs are not recommended for women with Wilson's disease or allergies to copper. Women with a history of breast cancer cannot use the mirena IUD. Women with diabetes should be monitored

carefully if they use the Mirena IUD. Breast feeding women should be aware the synthetic hormone in the Mirena IUD is excreted in breast milk

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