437 Team: Obstetrics and Gynecology

Family Planning

Objectives:

- Describe the mechanism of action and effectiveness of contraceptive methods
- Counsel the patient regarding the benefits, risks and use for each contraceptive method including emergency contraception
- Describe barriers to effective contraceptive use and to reduction of unintended pregnancy
- Describe the methods of male and female surgical sterilization
- Explain the risks and benefits of female surgical sterilization procedures.

References:

- Kaplan USMLE step 2 CK - Obstetrics and Gynecology
- Online Meded videos
- Team 435

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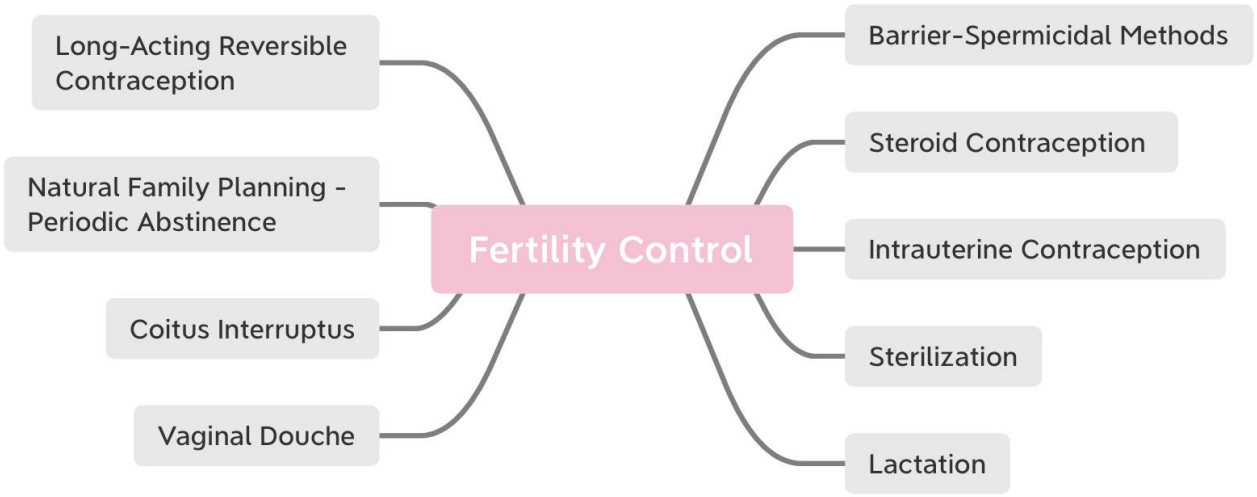
Overview:

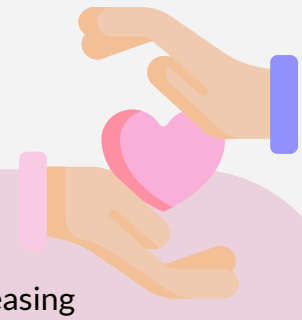


Barrier-Spermicidal Methods: 71-84% effective

These are locally active devices preventing entry of sperm in through the cervix, thus preventing pregnancy (Low Efficacy, Non-Invasive and prn in usage. Higher risk of failure). There are several types which are :

1. **Condoms (most common):** penile sheaths that must be placed on the erect penis. No individual fitting is required.
2. **Vaginal diaphragm:** dome-shaped device placed in the anterior and posterior vaginal fornices holding spermicidal jelly against the cervix. It can be placed an hour before intercourse; Individual fitting is required. (If too large a size is used, it can result in urinary retention).
3. **Spermicides:** active ingredient is nonoxynol-9, a surface-active agent that disrupts cell membranes (and thus the possible side effect of genital membrane irritation); These can take the form of jellies or foams placed into the vagina. (Does Not prevent you from STDs, used in conjunction with one of the above modalities bc its not a barrier).

Advantages:
- Barrier methods become increasingly effective with advancing age and the associated natural decline in fertility.
- Protect against some STDs (The only method that can protect you)
- No systemic side effects.



Disadvantages:
- Failure rate approaches 20%. (Significantly higher than other methods.)
- They are coitally dependent, requiring a decision for each use, thus decreasing spontaneity.
- Barrier methods have no impact on excessive menstrual flow or excessively painful menses

Steroid contraception:

- Steroid contraception inhibits the midcycle luteinizing hormone (LH) surge, thus **preventing ovulation**; alters cervical mucus making it thick and viscid, thus retarding sperm penetration; and alters endometrium, thus inhibiting blastocyst implantation.
-You should wait for 2-3 weeks after delivery before giving combined pills as it increases the risk of DVT (which is already high)

Estrogen-Mediated Metabolic Effects:
- Fluid retention from decreased sodium excretion;
- Accelerated development of cholelithiasis
- Increase in hepatic protein production (e.g., coagulation factors, carrier proteins, angiotensinogen)
- Healthy lipid profile changes (increase in HDL, decrease in LDL)
- Increased venous and arterial thrombosis.

Progestin-Mediated Metabolic Effects:
- Mood changes and depression from decreased serotonin levels
- Androgenic effects (e.g., weight gain, acne);
- Unhealthy lipid profile changes (decreased HDL, increased LDL).

1. **Absolute Contraindications:** include pregnancy, acute liver disease, history of vascular disease (e.g., thromboembolism, DVT, CVA, SLE), hormonally dependent cancer (e.g., breast), smoker ≥35, uncontrolled hypertension, migraines with aura, diabetes mellitus with vascular disease and known thrombophilia.
2. **Relative Contraindications:** include migraine headaches, depression, diabetes mellitus, chronic hypertension and hyperlipidemia.
3. **Noncontraceptive Benefits:** include decreased ovarian and endometrial cancer, decreased dysmenorrhea and dysfunctional uterine bleeding, and decreased PID and ectopic pregnancy.

1. Combination Modalities:

Combination OCPs. These contain both an estrogen and a progestin. They are administered most commonly in **one of two ways**:

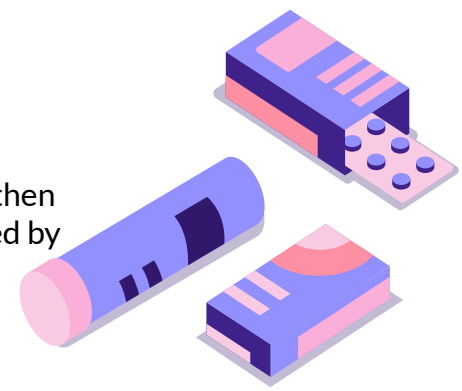
- Daily with 21 days on and 7 days off
- Daily 24 days on and 4 days off.

When "off " the hormones, withdrawal bleeding will occur. Failure rate is 2% with ideal use.
A newer combination is with daily hormones for 12 weeks followed by 1 week of placebo, which results in 4 periods a year rather than 13 with the traditional schedule.

- **Types:**

1

Oral Contraceptives:
A unique combination of OCP (YAZ) reduces severe PMDD symptoms by 50%. It contains ethinyl estradiol and a new progestin, drospirenone. The dosing is 24 days of active pills then 4 days of placebo, rather than the traditional 21 days, followed by 7 days of placebo.



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Combination Vaginal Ring:
Marketed under the trade name of NuvaRing, contains both an estrogen and a progestin. It is inserted into the vagina and then removed after 3 weeks for 1 week to allow for a withdrawal bleed. A major advantage is relatively stable and constant blood levels of hormones. Failure rate is similar to combination OCPs.

3

Transdermal skin patch:
Marketed under the trade name of Ortho Evra, contains both an estrogen and a progestin. A patch is replaced every week for 3 weeks then removed for 1 week to allow for a withdrawal bleed. Levels of steroids are 60% higher than combination OCPs.

2. Progestin-Only Modalities

Progestin-Only OCPs. They contain only progestins and are sometimes called "mini pill." They need to be taken daily and continuously. A frequent side effect is breakthrough bleeding. Failure rate is 3% with ideal use.

- **Types;**

	General info	Side effects	Failure rate
Progestin-Only Injectable 99% effective	**IM injection of** depo-medroxyprogesterone acetate (DMPA) Marketed under the trade name of **Depo-Provera**. It lasts for 12 to 14 weeks. The slow release allows administration only **every 3 months**.	- Breakthrough bleeding. -Prolonged time for fertility return - Decreased bone mineral density	<1%
Progestin-Only Subcutaneous Implant	Uses etonogestrel as the active ingredient and is marketed under the trade name of Nexplanon,. The core contains a small amount of barium, making it visible on x-ray. The continuous release continues for 3 years.	- Breakthrough bleeding. (This is not favourable among muslim women as it interferes with praying and fasting)	<1%
"Morning-After" Pill (levonorgestrel) within 3 days **or** (ella) → contains ulipristal acetate within 5 days of intercourse	Uses levonorgestrel tablets and is marketed under the trade name of "Plan B," This postcoital contraception is administered as one tablet, immediately followed by one additional tablet in 12h. It must be taken within 72 hrs after intercourse. The earlier it's taken the batter the results.	-	1%

- **General.** A recent evaluation of women's views regarding contraceptive health benefits demonstrated that most women are unaware of the protective effects of OCPs against endometrial and ovarian cancer, PID, ectopic pregnancy, benign breast disease, anemia, and dysmenorrhea.

- **Risks and Benefits:**
  - In nonsmoking women age >40, currently available OCPs are extremely safe.
  - Low-dose contraceptive pills do not significantly increase the risk of cancer, heart disease, or thromboembolic events in women with no associated risk factors (hypertension, diabetes, or smoking).
  - The combination estrogen/progestin pill tends to reduce menstrual flow and dysmenorrhea, and it regulates the menses, all of which would be excellent benefits for the patient.

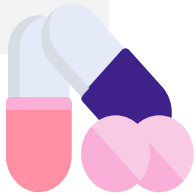
Intrauterine contraception:

Intrauterine contraception is a long-acting reversible contraceptive method that involves placement of a small T-shaped object inside the uterus. Failure rate is < 1%. Continuation rates at 1 year are almost 80%.

MOA includes the following:

- Decreased sperm transport
- Increased tubal motility (causing failure of implantation of immature zygote)
- Decreased implantation secondary to endometrial inflammation
- Phagocytic destruction of sperm and blastocyst
- Alteration of cervical mucus (only progesterone IUSs)

1. **Absolute Contraindications:** include a confirmed or suspected pregnancy; known or suspected pelvic malignancy; undiagnosed vaginal bleeding; and known or suspected salpingitis.
2. **Relative Contraindications:** include abnormal uterine size or shape; medical condition (e.g., corticosteroid therapy, valvular heart disease, or any instance of immune suppression increasing the risk of infection); nulligravidity; abnormal Pap smears; and history of ectopic pregnancy.
3. **Side Effects:** include increased menstrual bleeding and menstrual pain (with the copper IUD, but not with the progesterone IUSs).
4. **Potential Complications**:
   a. **Expulsion** is higher in young, low parity women.
   b. **Ectopic pregnancy.** The IUS does not increase ectopic pregnancies. However, with pregnancy from failed IUS, the likelihood of it being ectopic is higher because primarily, intrauterine pregnancies are prevented.
   c. **Septic abortion** occurs in 50% of patients with concurrent pregnancy.
   d. **Uterine perforation**, although rare, occurs more likely at time of insertion.
   e. **PID** may occur within the first 2 months after placement if pathogenic organisms are present in the reproductive tract.



Four types of IUD are available in the United States. Failure rate for all IUDs is <1%. :

- Copper IUD: "**Paragard**" contains 380 mm2 copper, approved for 10 years (abbrev TCu380A)
- Levonorgestrel (LNg) IUDs: "**Mirena**" contains 52 mg LNg, approved for 5 years (abbrev LNg52/5)
- Levonorgestrel (LNg) IUDs: "**Liletta**" contains 52 mg LNg, approved for 3 years (abbrev LNg52/3)
- Levonorgestrel (LNg) IUDs: "**Skyla**" contains 13.5 mg LNg, approved for 3 years

Long-Acting Reversible contraception: 99% effective

Long-acting reversible contraceptives (LARCs) provide effective contraception for an extended period without requiring user action (the best method).

Methods used includes the following:

- Intramuscular injection (e.g. DMPA)
- Intrauterine device (IUD):
  - Copper IUD (Paragard): Works by creating an unfavorable environment for the sperm to fertilize the egg.
  - LNG-IUS (Mirena) : Works by increasing the thickness of cervical mucus to prevent sperm from entering the uterus.
- Subdermal progestin implant (Nexplanon): is usually inserted subdermally in the upper non-dominant arm and lasts 3 years.

Advantages:

- Considered the most effective reversible method of contraception because patient compliance is not required. 'Typical use' failure rates, at <1% per year, are about the same as 'perfect use' failure rates (similar to sterilization procedures).
- Long-lasting and convenient
- Sell-liked by users and very cost-effective.

Disadvantages:

- Higher up-front cost ($800–900 in United States), as compared with other methods such as oral contraceptive pills, the patch, and vaginal ring.

Natural Family Planning- Periodic Abstinence

-This method is based on avoiding sexual intercourse around the time of predicted ovulation. It assumes the egg is fertilizable for 12 to 24 hours and sperm is capable of fertilizing the egg for 24 to 48 hours. Requires high degree of discipline from both sexual partners.

Methods used. Prediction or identification of ovulation may be inferred from: menstrual records, basal body temperature charting (temperature rise from thermogenic effect of progesterone), change in cervical mucus from thin and watery to thick and sticky (reflects the change from estrogen dominance preovulation to progesterone dominance post-ovulation).

-Abstinence is the only 100% effective method, other methods have different rates of efficacy.

Advantages:

- Inexpensive
- Readily available.
- No steroid hormonal side-effects.
- May be preferred for religious reasons.

Disadvantages:

- Inaccurate prediction of ovulation.
- High failure rate because of human frailties and the passions of the moment.

Coitus Interruptus:

In this practice, also known as **withdrawal** or pull-out method, the man withdraws his penis from the woman's vagina prior to orgasm and ejaculation. It is one of the oldest contraceptive methods described.

Advantages:

- Readily available..
- Inexpensive.
- Free of systemic side effects.

Disadvantages:

- High failure rates.
- No protection against STDs..
- High degree of discipline required.
- Semen can enter vagina and cervical mucus prior to ejaculation.

Vaginal Douche:

With vaginal douche, plain water, vinegar and other products are used immediately after orgasm to theoretically flush semen out of the vagina. It has a long history of use in the United States.

Advantages:

- None

Disadvantages:

- High failure rates.
- No protection against STDs..
- Semen can enter vagina and cervical mucus within 90 seconds of ejaculation.

Lactation:

With lactation, elevated prolactin levels with exclusive breastfeeding inhibit pulsatile secretion of GnRH from the hypothalamus. Effectiveness is dependent on the frequency (at least every 4-6 hours day & night) and intensity (infant suckling rather than pumping) of milk removal.

Advantages:

- Enhanced maternal and infant health, bonding, and nutrition.
- Inexpensive.
- Readily available.
- Needs no supplies.
- Free of systemic side effects.
- Acceptable to all religious groups.

Disadvantages:

- High failure rate if not exclusively breastfeeding.
- Reliable for only up to 6 months.
- No protection against STDs..

Sterilization: 99% effective

Sterilization is a surgical procedures usually involving ligation of the female oviduct or male vas deferens. After the procedure is performed, there is nothing to forget and nothing to remember. They are to be considered permanent and irreversible.

- **Female sterilization**
  - Tubal Ligation:
    - Most common modality of pregnancy prevention in the United States.
    - Ligation of fallopian tube by clips, rings or removal of a segment of the oviduct is performed in an operating room through a transabdominal approach usually using a laparoscopy or minilaparotomy.
    - Failure rate is 1 in 200
    - This method is usually only done for older women (40+) with previous multiple C-sections and complications.
    - It is almost NEVER used for younger women
  - Hysteroscopy tube occlusion:
    - Procedure performed vaginally either in the operating room or clinic.
    - Metal coils are inserted into the fallopian tubes and scar tissue develops, effectively blocking the tube.
    - To make sure that the tube is fully occluded, hysterosalpingogram is done 3 months after the procedure.

Advantages of female sterilization:

- Decrease lifetime risk of ovarian cancer
- Protection from pelvic inflammatory diseases.

Disadvantages of female sterilization:

- Ectopic pregnancy (7.3/1000)
- Regret (increased risk of regret with low parity, performed at time of C-section, age>25 or done under pressure)

- **Male sterilization**
  - Vasectomy:
    - Destruction or removal of a segment of vas deferens to prevent sperm from entering the rest of the seminal fluid.
    - It's an outpatient procedure using local anesthesia.
    - Failure rate is 1 in 500.
    - A successful procedure can be confirmed by absence of sperm on a semen specimen obtained 12 ejaculations after the surgery.
    - Sperm antibodies can be found in 50% of vasectomized patients.

Drs Notes:

- Before starting any contraceptive methods (including: Combined OCP, Depo-provera, subdermal implants and IUD) you must make sure the patient is **not pregnant**. Either by a negative pregnancy test or starting contraception on the 5th day of menstruation.

- Combined OCP are also commonly used for women that suffer from menorrhagia, severe dysmenorrhea or even just to regulate irregular cycles. Regardless of marital status or sexual activity.

Extra: These have very low efficacy (it does not work usually):

- Natural family planning: monitoring cycles for fertile periods.
- Withdrawal:"Coitus Interruptus." Pre-ejaculate can have semen in it. Failure to pull out once can result in failure. No STI protection.
- Abstinence: Works if you really do it.

TEACHING CASE

A 17 year old G0 female presents to clinic desiring information about contraceptive methods. She reports that she is sexually active with her boyfriend, using condoms occasionally, when she "needs them." She has never used any other methods. She has had 2 lifetime partners. She became sexually active at age 15 and had sex with her first partner 3-4 times but didn't use contraception. She has been sexually active with her current partner for the last year. She came today because she last had unprotected intercourse 3 days ago and is worried she might get pregnant. She has decided it's time for a more reliable method of contraception. She has never had a pelvic exam. She has history of well controlled seizure disorder and had appendicitis at age 11. She is taking valproic acid. She smokes one-half pack of cigarettes per day, drinks alcohol socially, and uses occasional marijuana. Her blood pressure is 100/60 and pulse is 68.

1. What pertinent historical information should you obtain from any patient prior to presenting recommendations for appropriate contraception?

- Sexual history
  - Onset of sexual activity
  - Number of partners since onset
  - History of STIs
- Medical history – contraindications to estrogen-containing hormonal contraceptives
  - Migraines with aura
  - DVT
  - Uncontrolled hypertension
  - Smoking age>35
- Menstrual history -LMP(pregnancy) -Irregular menses
- Future fertility plans

2. What physical exam and studies are required prior to prescribing hormonal contraceptives?

- ❑ Pap and pelvic exam have typically been "bundled services," i.e., these exams are required to prescribe contraceptives. There is no rationale for this bundling.
- ❑ In general, Pap smears should be initiated at the age of 21. So, this patient would not require one at this time.
- ❑ STI screening for a sexually active teenager should include chlamydia and gonorrhea which may be tested from a urine sample. Screening for other STIs should be done based on individual risk assessment.
- ❑ A blood pressure should be obtained in patients who desire estrogen-containing contraceptives to rule out hypertension. Hypertension is rare in this age group, but blood pressure is easy to obtain, non-sensitive and low cost.
- ❑ Coagulation profile.

3. Which contraceptive agents are most suitable for this patient?

Agent	Advantages	Disadvantages
Combination hormonal methods: Pills, patch, ring	• Very effective • Non contraceptive benefits include cycle control, decreased risk of anemia, ovarian cysts they may ask you in MCQs or OSCE about non-contraceptive purposes in using oral contraceptive pills: e.g. ovarian cyst, anemia, irregular cycle..etc.	• Nuisance"side effects–bloating, headache, breast tenderness and nausea. • No STI protection. • Need to remember daily, weekly ,monthly. • Seizure medications may decrease effectiveness. • Small risk of significant complication:DVT,PE,CVA,MI.
Condoms	• STI protection. • Only use when needed.	• Need to use every time. • Less effective.
Depo-medroxyprogesterone acetate injection	• 4 shots per year. • Highly effective.	• Irregular bleeding • Weight gain. • No STI protection.
Progestin (Etonogestrel) subdermal implant	• Single subdermal insertion of implant lasts for 3 years. • Highly effective.	
Copper IUD	• Long-term contraception. • Highly effective. • High continuation rate. • Maybe used for post-coital contraception.	• No STI protection. • Possible increased bleeding and/or cramps.
Levonorgestrel IUD	• Long-term contraception. • Many experience diminished bleeding which makes this an option for treatment of menorrhagia.	• Some experience hormone-related side effects. • Possible irregular bleeding. • No STI protection.
Plan B	• Backs up regular birth control. • Useful for accidents–condom breaking , discontinued methods.	• Less effective. • Maybe difficult to obtain.

4. When/how to start the contraceptive method?

- Consider contraception as an "emergency"
- Best if patient leaves with a method
- Advance prescriptions of Plan B to all patients (except those with an IUD) Best if method begins that day if negative pregnancy test
    a. Combination methods – Quick start: First pill on day of visit regardless of cycle, preferably in clinic.
    b. Depo-provera–Same day shot.
    c. Subdermal implant–Same day insertion.
    d. IUD–Same day insertion.

OnlineMedEd

Recommended first line, even to nullips and adolescents, due to low side effects, low failure rate, and ease of use. Can be removed at any time (even prior to the "lifetime" of the device) with return to fertility:

Nexplanon/Implanon	Implantable (3 years)	
IUD - Levonorgestrel (hormonal) IUD - Copper (non hormonal)	Implantable (5 years) 10 year (the longest)	Risk for DVT Risk for bleeding
Non-reversible forms of contraception: Tubal Ligation Vasectomy	Both surgical (both permanent)	TL Increases the risk for ectopic pregnancy.

Women who want temporary contraception and are highly compliant. Risk of failure is higher, but the invasiveness is less:

Depo-provera	Injections (3 months)	Used non compliant patient
Ortho-Evra (E + P)	Patches (1 month)	Highest risk for DVT/PE
Nava-Ring (E +P)	Inserted Vaginally (1 month)	
OCPs (E + P)	Pills (taken daily)	Used for long term sterility are not desired like dysfunctional uterine bleeding.
Mini pills (only P)	Must be taken religiously down to the hour	