Contraception

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Introduction

Contraception generally implies the prevention of pregnancy following sexual intercourse by:

- Inhibiting viable sperm from coming into contact with a mature ovum (barriers)
- Preventing ovulation
- Preventing a fertilized ovum from implanting successfully in the endometrium (create an unfavorable uterine environment)

Menstrual Cycle

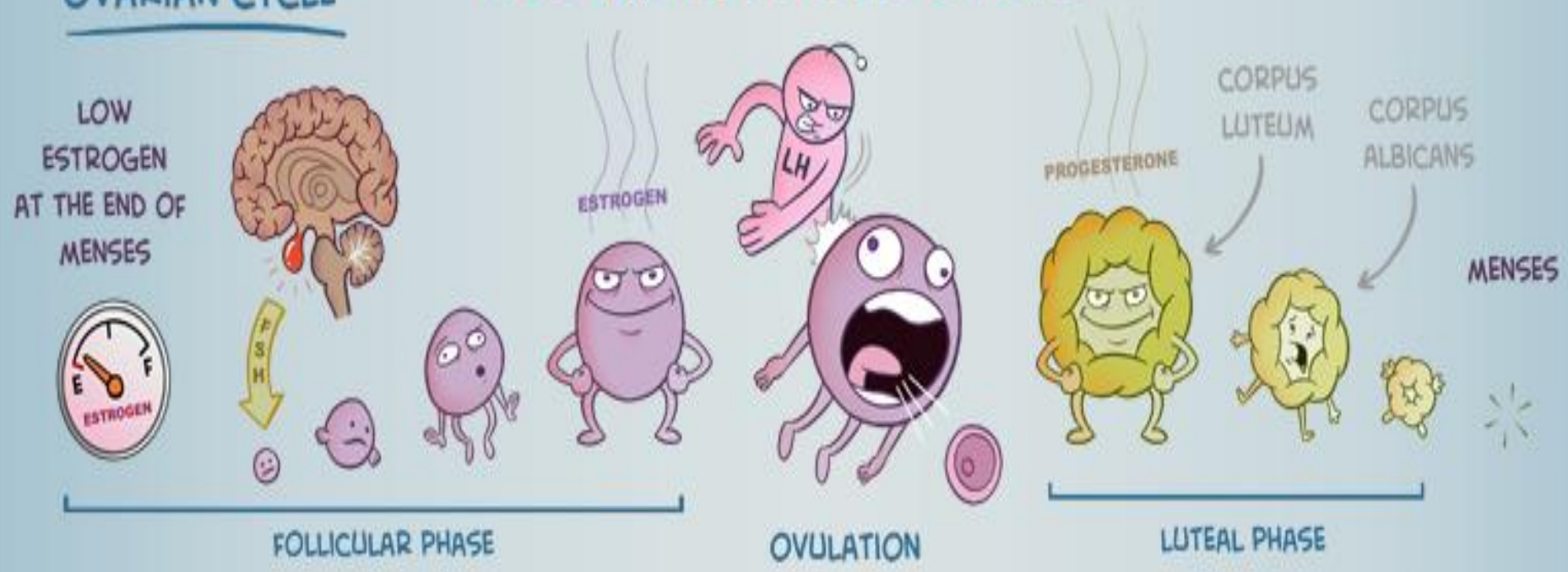
Begins with menarche, around age 12 y, continues until menopause, around age 50 y.

- The cycle includes the vaginal discharge of sloughed endometrium called *menses* or *menstrual flow.*

- **<u>Three phases:</u>**
  - Follicular (or pre-ovulatory)
  - Ovulatory
  - Luteal (or post-ovulatory)

THE MENSTRUAL CYCLE

OVARIAN CYCLE



UTERINE CYCLE

PROLIFERATIVE PHASE: INFLUENCED BY ESTROGEN, THE THICKNESS OF THE ENDOMETRIUM RAPIDLY INCREASES

SECRETORY PHASE: INFLUENCED BY PROGESTERONE, THE LINING BECOMES HIGHLY VASCULAR AND EDEMATOUS

- The first day of menses is referred to as *day 1 of the menstrual cycle* and marks the beginning of the follicular phase
- The follicular phase continues until ovulation, which typically occurs on day 14
- The time after ovulation is referred to as the *luteal phase*, which lasts until the beginning of the next menstrual cycle
- The median menstrual cycle length is **28 days**, but it can range from **21 to 40 days**

Follicular phase

- In the first 4 days, FSH levels rise and allow the recruitment of a small group of follicles for continued growth and development
- Between days 5 and 7, one follicle becomes dominant. Dominant follicle develops increasing amounts of estradiol and inhibin, which cause a negative feedback on secretion of GnRH and FSH, causing atresia of the remaining follicles
- Estradiol serves to stop the menstrual flow from the previous cycle, thickening the endometrial lining of the uterus to prepare it for embryonic implantation
- Estrogen is responsible for increased production of thin, watery cervical mucus, which will enhance sperm transport during fertilization

Ovulation

- When estradiol levels remain elevated for a sustained period of time (200 pg for at least 50 hours), the pituitary releases a mid-cycle LH surge
- On average, ovulation occurs 24 to 36 hours after the estradiol peak and 10 to 16 hours after the LH peak
- After ovulation, the oocyte is released and travels to the fallopian tube, where it can be fertilized and transported to the uterus for embryonic implantation
- Conception is most successful when intercourse takes place from 2 days before ovulation to the day of ovulation.

Luteal Phase

- The remaining luteinized follicle becomes the corpus luteum, which synthesizes androgen, estrogen, and progesterone
- Progesterone helps to maintain the endometrial lining, which sustains the implanted embryo and maintains the pregnancy
- If pregnancy occurs, hCG prevents regression of the corpus luteum
  - Stimulates continued production of estrogen and progesterone to maintain the pregnancy until the placenta is able to fulfill this role (usually 6–8 weeks' gestation)

- If fertilization or implantation does not occur, the corpus luteum degenerates, and progesterone production declines

- As progesterone levels decline, endometrial shedding (menstruation) occurs, and a new menstrual cycle begins

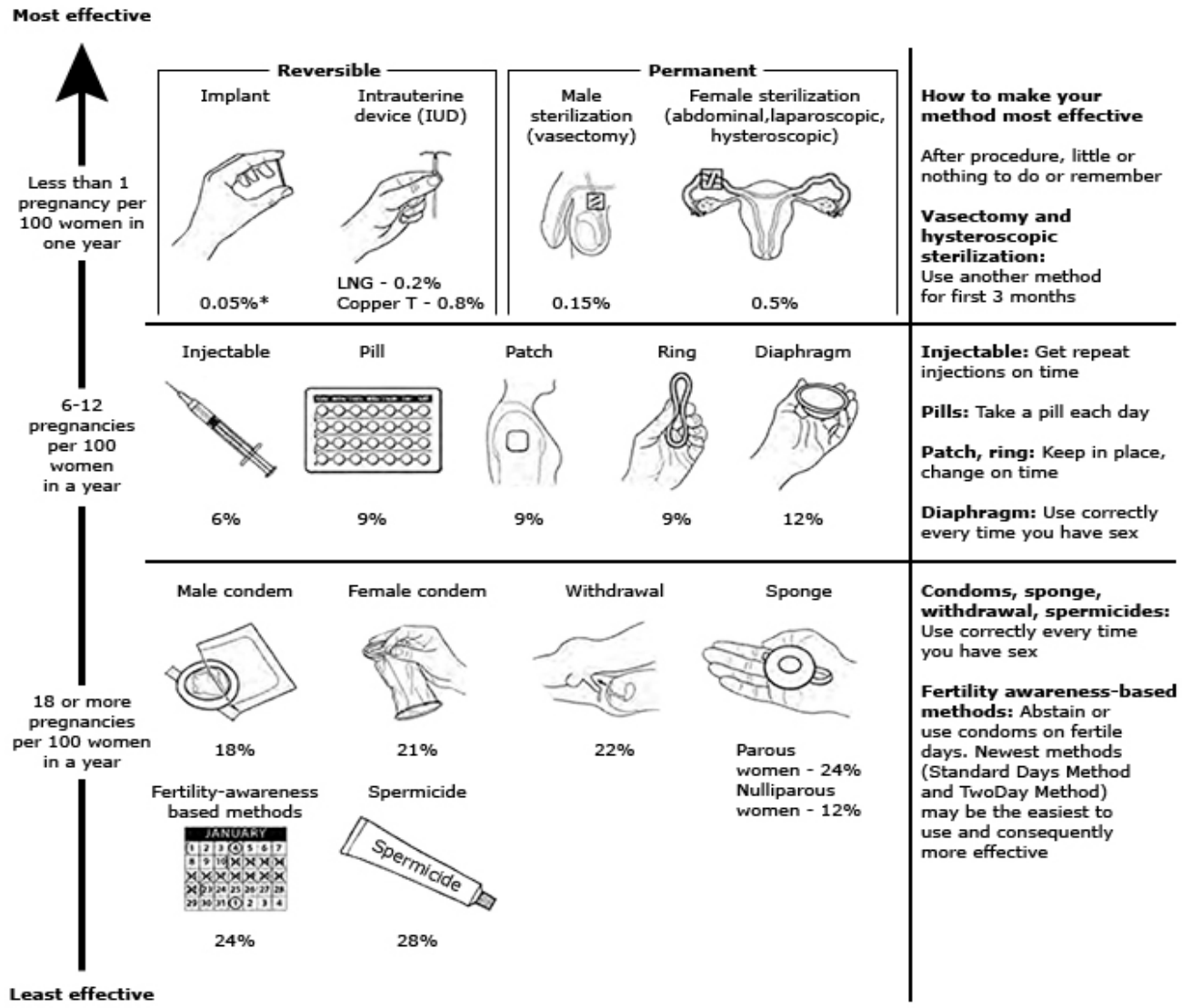
- At the end of the luteal phase, when estrogen and progesterone levels are low, FSH levels start to rise, and follicular recruitment for the next cycle begins.

- American College of Obstetrics and Gynecology (ACOG) and other national organizations allow provision of hormonal contraception after a simple medical history (diabetes, liver disease) and blood pressure measurement

- Pelvic and breast examinations, screening for cervical neoplasia, and counseling for prevention of STDs, can be accomplished during routine annual office visits

Non-pharmacologic Therapy

Comparing effectiveness of contraceptive methods



Condoms should always be used to reduce the risk of sexually transmitted infections.
Other methods of contraception:
Lactational Amenorrhea Method- LAM is a highly effective, *temporary* method of contraception.
Emergency Contraception- Emergency contraceptive pills or a copper IUD after unprotected intercourse substantially reduces risk of pregnancy.
%: percent.
* The percentages indicate the number out of every 100 women who experienced an unintended pregnancy within the first year of typical use of each contraceptive method.

Periodic Abstinence

- ✓ Avoiding sexual intercourse during the days of the menstrual cycle when conception is likely to occur
- ✓ These women rely on physiologic changes such as basal body temperature and cervical mucus during each cycle to determine the fertile period
- ✓ Relatively high pregnancy rates occur among users and need to avoid intercourse for several days during each menstrual cycle
  - ✓ To overcome these drawbacks, many women use barrier methods or spermicides during the fertile period

Barrier Technique

- The effectiveness of barrier methods and spermicides depends almost exclusively on a couple's motivation to use them consistently and correctly

- These methods include **condoms**, **diaphragms**, **cervical caps**, and **vaginal sponges**

- **A major disadvantage** is **higher failure rates than** with most **hormonal contraceptives**;

Male Condoms

- Condoms are devices that create a mechanical barrier, preventing direct contact of the vagina with semen, genital lesions and discharges, and infectious secretions

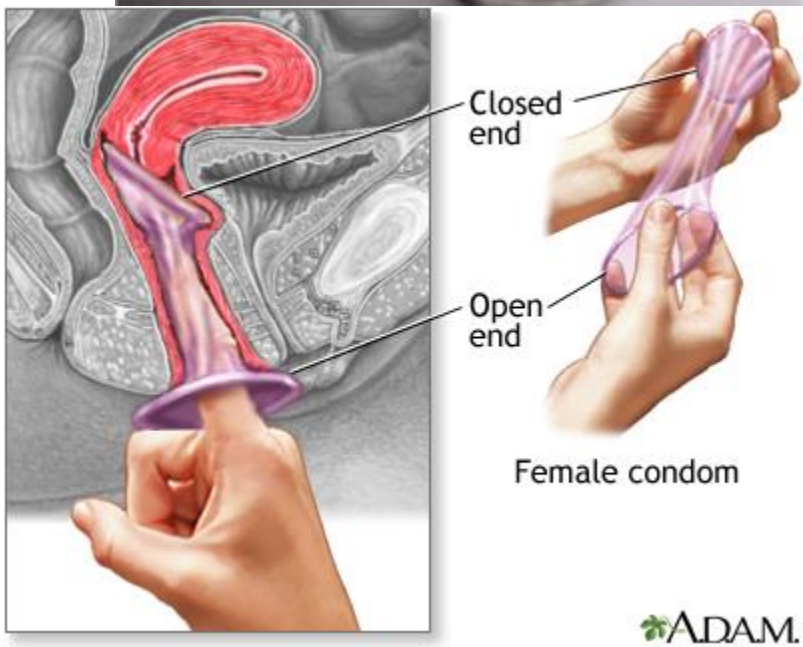
- Latex rubber, which is impermeable to viruses (prevention of STIs)

- Mineral oil–based vaginal drug formulations, lotions, or lubricants can decrease the barrier strength of latex by 90% in just 60 seconds, thus making water-soluble lubricants (e.g., K-Y Jelly) preferable.

- Polyurethane
  - Break more easily than latex
  - More expensive
  - Allergy to latex
  - Conduct heat better than latex

Female Condoms

- Closed at one end, with flexible rings at both ends
- Properly positioned, the ring at the closed end covers the cervix, and the sheath lines the walls of the vagina
- The outer ring remains outside the vagina, covering the labia; this may make the female condom **more effective than the male condom in preventing STDs**
- Pregnancy rate is reported to be 21 % in the first year of use

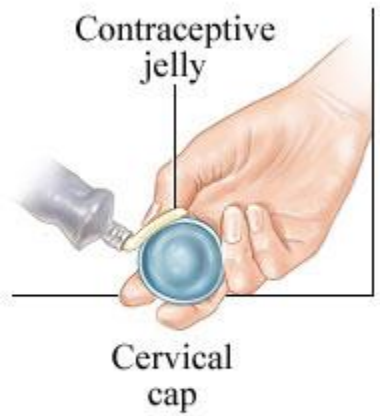


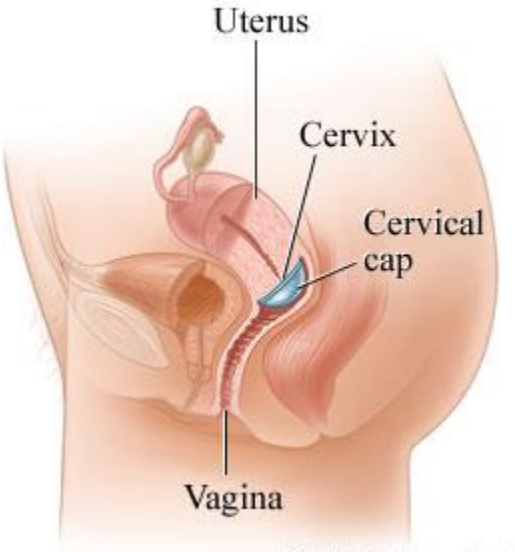
Diaphragm

- Reusable rubber cap with a flexible rim that is inserted vaginally
- Fits over the cervix in order to decrease access of sperm to the ovum
- **Fitting!!!**
- The diaphragm may be **inserted up to 6 hours before intercourse and must be left in place for at least 6 hours afterward**

Cervical Cap

- A soft, deep cup with a firm round rim that is smaller than a diaphragm and fits over the cervix like a thimble
- Caps can be inserted 6 hours prior to intercourse and **remain in place for multiple episodes of intercours without adding more spermicide**
- Failure rates are higher than with other methods, perhaps due to difficulty in fitting the cap





Vaginal Spermicides

- Are chemical nonionic surfactants (nonoxynol-9) that destroy sperm cell walls and act as barriers that prevent sperm from entering the cervical os
- Offer no protection against STDs.
- When used frequently (more than two times per day), may increase the risk of transmission of HIV by causing small disruptions in the vaginal epithelium

Pharmacologic Therapy

Hormonal Contraception

- **Contain either a combination of estrogen & progestin or a progestin alone**

- **OC preparations first became available in the 1960s, but options have expanded to include:**
  - Transdermal patch
  - Vaginal contraceptive ring
  - Long-acting injections
  - Implants
  - Intrauterine contraceptives

Components

- **Progestins provide most of the contraceptive effect by:**

  - Thickening cervical mucus to prevent sperm penetration
  - Slowing tubal motility and delaying sperm transport
  - Inducing endometrial atrophy
  - Blocking the LH surge, therefore inhibiting ovulation

Estrogens:

- ✓ Suppress FSH release from the pituitary
- ✓ May contribute to blocking the LH surge and preventing ovulation
- ✓ The primary role of estrogen in hormonal contraceptives is to stabilize the endometrial lining and provide cycle control

Non-contraceptive Benefits of CHC

- Relief from menstruation-related problems (e.g., decreased menstrual cramps, decreased ovulatory pain, and decreased menstrual blood loss, PMS, PMDD)
- Improvement in menstrual regularity
- Increased hemoglobin concentrations
- Improvement in acne
- Reduced risk of ovarian and endometrial cancer, which is detectable within 1 year and persists for years after discontinuation
- Reduce the risk of ovarian cysts, ectopic pregnancy, pelvic inflammatory disease, and benign breast disease (cyst or fibroadenomas)

Notes:

- The CHC transdermal patch is convenient because it is applied only once weekly
- It may be associated with less breast discomfort and dysmenorrhea than OCs
- The CHC vaginal ring also has the advantage of convenience, being inserted for 3 weeks at a time

Adverse Effects of CHC

- Estrogen excess can cause nausea and bloating
- Low-dose estrogen CHCs can cause early or mid-cycle breakthrough bleeding and spotting
- Progestin excess may be associated with fatigue and changes in mood
- Low-dose progestin CHCs may cause late-cycle breakthrough bleeding and spotting
- Androgenic activity derived from progestins may cause increased appetite and acne

Choosing a Pill

Woman wants to use "the Pill," do any of the following apply:

- Smoking & age 35 or older**
- Hypertension**
- Undiagnosed abnormal vaginal bleeding
- Diabetes with vascular complications or more than 20 years duration**
- DVT or PE (unless anticoagulated) or current or personal history of ischemic heart disease**
- Multiple risk factors for arterial cardiovascular disease**
- Headaches with focal neurological symptoms** or personal history of stroke
- Current or past history of breast cancer**
- Active viral hepatitis or mild or severe cirrhosis**
- Breast-feeding exclusively at the present time**
- Major surgery with immobilization within 1 month**
- Personal history of cholestasis with COC use** or pregnancy

YES
History positive for one or more of above conditions

May not be able to use COCs

Consider progestin only method: POPs (Micronor, Nor QD or Ovrette), Depo-Provera injections, Implanon or Mirena IUS, ParaGard IUD

Consider non-estrogen methods: progestin-only methods, condoms, diaphragm or cervical cap with spermicide, natural family planning methods, vasectomy or tubal sterilization

NO
History negative for all of above conditions

May use any sub-50-microgram COC* continuously or cyclically

Choose continuous or cyclic COC based on patient desires, availability, side effects, non-contraceptive benefits, cost, and prior experience of woman or clinician.

• The World Health Organization and the Food and Drug Administration both recommend using the lowest dose pill that is effective. All combined pills with less than 50 mcg of estrogen are considered "low-dose" and are effective and safe.

• There are no studies demonstrating a decreased risk for deep vein thrombosis (DVT) in women on 20-mcg pills. Data on higher dose pills have demonstrated that the less the estrogen dose, the lower the risk for DVT.

• All COCs lower free testosterone. Class labeling in Canada for all combined pills states that use of pills may improve acne.

• To minimize discontinuation due to spotting and breakthrough bleeding, warn women in advance, reassure that spotting and breakthrough bleeding become better over time.

*The package insert for women on Yasmin and Yaz states [Berlex-2001]: "Yasmin is different from other birth control pills because it contains the progestin drospirenone. Drospirenone may increase potassium. Therefore, you should not take Yasmin if you have kidney, liver or adrenal disease, because this could cause serious heart and health problems. Other drugs may also increase potassium. If you are currently on daily, long-term treatment for a chronic condition with any of the medications below, you should consult your healthcare provider about whether Yasmin is right for you, and during the first month that you take Yasmin, you should have a blood test to check your potassium level: NSAIDs (ibuprofen [Motrin®, Advil®], naproxen [Naprosyn®, Aleve®, and others] when taken long-term and daily for treatment of arthritis or other problems]; potassium-sparing diuretics (sprironolactone and others); potassium supplementation; ACE inhibitors (Capoten®, Vasotec®, Zestril® and others); Angiotensin-II receptor antagonists (Cozaar®, Diovan®, Avapro® and others); heparin."

**These are conditions that receive a WHO:3 or a WHO:4 (based on WHO Medical Eligibility Criteria for Contraceptive Use, 4th ed. 2009, Category 3—A condition in which theoretical or proven risks usually outweigh the benefit of contraceptive method use, Category 4—A condition that represents an unacceptable health risk if contraceptive method is used).

FIGURE 47-1 Choosing a pill. ACE, angiotensin-converting enzyme; COC, combined oral contraceptive; DVT, deep venous thrombosis; IUD, intrauterine device; IUS, intrauterine system; NSAIDs, nonsteroidal anti-inflammatory drugs; PE, pulmonary embolism; POP, progestin-only pill. (Adapted with permission from Zieman M et al. *Managing Contraception for Your Pocket 2010–2012*. Tiger, GA: Bridging the Gap Communications; 2010:108, Figure 26.2.)

Women older than 35 y

CHCs containing less than 50 mcg EE are an acceptable form of contraception for non-smoking women up to the time of menopause

Smoking

- Practitioners should prescribe CHC with caution, if at all, to women older than 35 years who smoke

- The WHO precautions further state that smoking 15 or more cigarettes per day by women in this age group is a contraindication to CHC, and that the risks generally outweigh the benefits of CHC in those who smoke fewer than 15 cigarettes per day

- **Progestin-only contraceptive methods should be considered for women in this group**

Hypertension

- CHCs, even those containing less than 35 mcg of estrogen, can cause small increases (i.e., 6–8 mmHg) in blood pressure

- Use of low-dose CHC is acceptable in women younger than 35 years with well-controlled and frequently monitored hypertension

- Discontinuing the CHC usually restores BP to pre-treatment values within 3 to 6 months

- **Progestin-only pills and DMPA** have not been shown to increase blood pressure or increase the risk of vascular events in normo-tensive or hypertensive women and therefore are **choices for women with hypertension**

Dyslipidemia

- Most low-dose CHCs have no significant impact on HDL, LDL, triglycerides, or total cholesterol

- Women with controlled dyslipidemia can use low-dose CHCs, although periodic fasting lipid profiles are recommended

- **Women with uncontrolled dyslipidemia** (LDL >160 mg/dL, HDL <35mg/dL, triglycerides >250 mg/dL) **and additional risk factors** (e.g., CAD, diabetes, HTN, smoking, or positive family history) should use **an alternative method of contraception**

Diabetes

- Nonsmoking women younger than 35 years with diabetes but no associated vascular disease can safely use CHCs

- **Diabetic women with vascular disease (e.g., nephropathy, retinopathy, neuropathy, or other vascular disease) or diabetes of more than 20 years' duration should not use CHCs**

- **Copper and progestin-releasing IUDs** have not been associated with impaired metabolic control in women with uncomplicated diabetes

Migraine Headache

- May experience a decreased or an increased frequency of migraine headaches when using CHCs
- In population-based studies, **the risk of stroke in women with migraines has been elevated twofold to threefold** (**more aura**)
- ACOG recommends considering CHCs in healthy, nonsmoking women with migraine headaches if they do not have focal neurological signs
- **Women of any age who have migraine with aura should not use CHC**
- **Women who develop migraines (with or without aura) while receiving CHC should discontinue use immediately**

Breast Cancer

- **The choice to use CHCs should not be affected by the presence of benign breast disease or a family history of breast cancer**

- The WHO precautions state that women with **a recent personal history of breast cancer should not use CHCs**, but that CHCs **can be considered in women without evidence of disease for 5 years**

Thromboembolism

- **Estrogens** increase hepatic production of **factor VII**, **factor X**, and **fibrinogen** in the coagulation cascade

- These risks are increased in women who have underlying or acquired hypercoagulable states(e.g., obesity, pregnancy, immobility, trauma, surgery, and certain malignancies)

- **The risk of venous thromboembolism (VTE) in women currently using low-dose OCs (<50mcg EE with norethindrone or levonorgestrel) was 4 times the risk in nonusers**

- **OCs containing desogestrel have been associated with a 1 .7 to 19 times higher risk of VTE than OCs containing levonorgestrel ???**

- **CHCs are contraindicated in women with a history of thromboembolic events and in those at risk due to prolonged immobilization with major surgery (within 1 month) unless they are currently taking anticoagulants**

- **DMPA and levonorgestrel IUDs are also recommended for this population**

- **EC has not been associated with an increased risk of thromboembolic events**

Obesity

- Obese women (weight > 90 kg) taking OCs or using transdermal contraceptives are at increased risk for contraceptive failure compared to women with a normal BMI

- **Because increased pregnancy rates have not been documented in obese women using DMPA as the method of contraception, this or intrauterine methods of contraception should be considered**

SLE

- **CHCs should be avoided in women with SLE and anti-phospholipid antibodies or vascular complications**

- **Progestin-only contraceptives can be used in this situation**

Combined Oral Contraceptives (COCs)

- When OCs are used correctly, their effectiveness approaches that of surgical sterilization

- With perfect use, their efficacy is greater than 99%, but with typical use, up to 8% of women may experience unintended pregnancy

- Monophasic, Biphasic, Triphasic

- Combination multiphasic formulations have further lowered the total monthly hormonal dose without clearly demonstrating any significant clinical differences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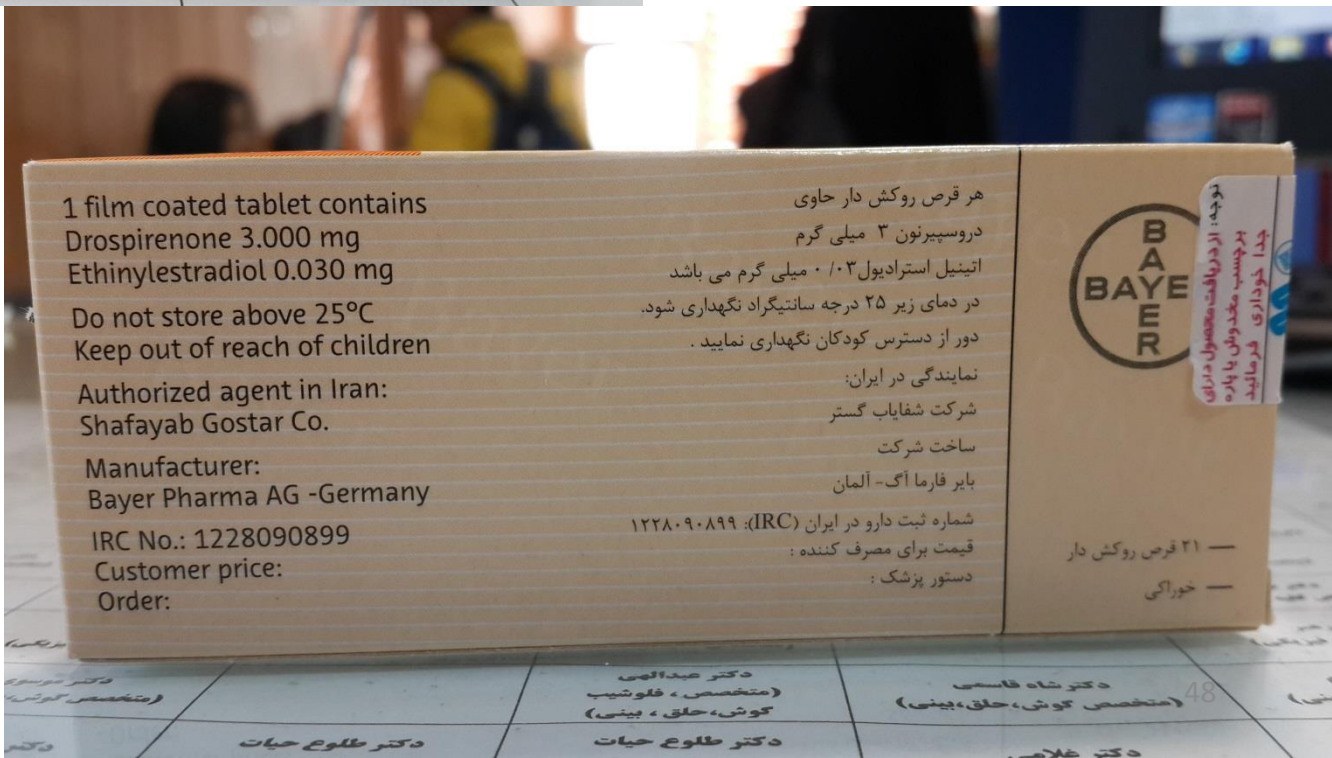
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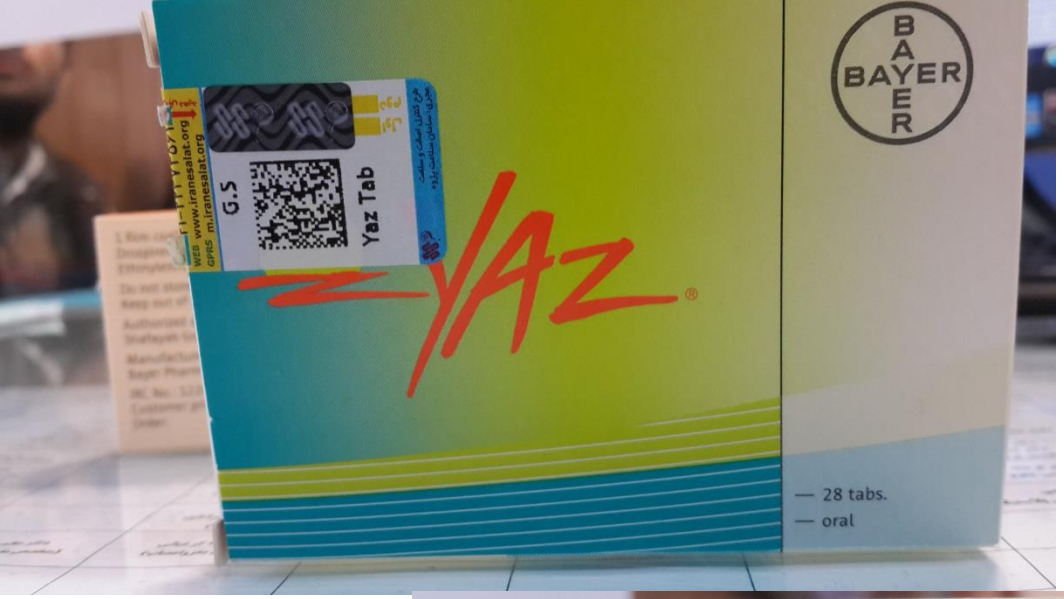
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Progestins in COCs:

Third generations:

- **Desogestrel**, drospirenone, **gestodene**, and **norgestimate**
- **Potent progestational agents** that appear to have no estrogenic effects and are **less androgenic compared with levonorgestrel on a weight basis**
- **Improved side-effect profiles**, such as **improving mild to moderate acne**
- **Drospirenone** also has antimineralocorticoid and antialdosterone activities, which may result in less weight gain compared to use of OCs containing levonorgestrel

Classification of progestins used in combined oral contraceptive pills

First generation
• Norethindrone acetate • Ethynodiol diacetate • Lynestrenol • Norethynodrel
Second generation
• dl-Norgestrel • Levonorgestrel
Third generation
• Desogestrel • Gestodene • Norgestimate
Unclassified
• Drospirenone • Cyproterone acetate

Level of androgenic activity of progestins in contraceptive pills

Level of activity	Androgenic brand name(s)
High	Norgestrel
	Levonorgestrel
Middle	Norethindrone
	Norethindrone acetate
Low	Ethynodiol
	Norgestimate
	Desogestrel
	Drospirenone
	Dienogest

Progestin-only Contraceptives

- Tend to be less effective than combination OCs
- Are associated with irregular and unpredictable menstrual bleeding

Minipills

- Must be taken every day of the menstrual cycle at approximately the same time to maintain contraceptive efficacy

- If a progestin-only pill is taken more than 3 hours late, patients should use a backup method of contraception for 48 hours

- Because minipills may not block ovulation (nearly 40% of women continue to ovulate normally), the risk of ectopic pregnancy is higher with their use than with use of other hormonal contraceptives


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Ampoule of 1 ml
Depogesterone®
Medroxyprogesterone Acetate
Each Ampoule (1 ml) Contains:
Medroxyprogesterone Acetate 150 mg
Not for IV Injection
For deep IM Injection only
Shake well before use
Manufactured by Iran Hormone Tehran - Iran

How to start COCs ?

Quick Start Method:

- **Patient takes the first pill on the day of her office visit (after a negative urine pregnancy test)**
- **Women should be instructed to use a backup contraception for the first 7 days of the cycle**
- Inform that the menstrual period will be delayed until completion of the active pills in the current OC pill pack
- No evidence shows increased bleeding irregularities with this method of OC initiation

Day 1 start method:

- Take the first tablet in the COC pack on the first day of menses

Sunday start method:

- Take the first tablet in the COC pack on the first Sunday after the beginning of menstruation. If menses begins on Sunday, start that day.
- Result in “period -free” weekends
- Use a backup contraception for the first 7 days of the cycle

Postpartum

- There is concern about use of OCs because of the mother's hypercoagulability and the effects on lactation

- **The CDC recommends that, in the first 21 days postpartum (when the risk of thrombosis is higher), estrogen -containing hormonal contraceptives should be avoided if possible**

- If additional risk factors exist for VTE, women who are breast-feeding avoid CHC in the first 6 weeks postpartum

- If contraception is required during this period, progestin-only pills and IUDs (progesterone or copper) are acceptable choices

Breastfeeding can be relied upon to prevent pregnancy when:

- Less than six months postpartum, breastfeeding exclusively, amenorrheic

Choice of OCs

- ✓ All combined OCs are similarly effective in preventing pregnancy
- ✓ Women weighing more than 160 lb (72.7 kg) may have higher contraceptive failure rates with low-dose OCs and may benefit from pills containing 35–50 mcg of EE
- ✓ Women with regular heavy menses initially may benefit from a 50-mcg EE OC as well because of their higher endometrial activity
- ✓ Women with oily skin, acne, and hirsutism should be given low androgenic OCs

Candidates for progestin only

- ✓ Migraine headaches
- ✓ History of thromboembolic disease
- ✓ Heart disease
- ✓ Cerebrovascular disease
- ✓ SLE with vascular disease
- ✓ Hypertriglyceridemia
- ✓ Women older than 35 years:
- ✓ Smokers
- ✓ Obese
- ✓ Hypertension
- ✓ Vascular disease

OC side effects

- ✓ Many symptoms occurring with early OC use (e.g., nausea, bloating, breakthrough bleeding) improve spontaneously by the third cycle of use after adjusting to the altered hormone level

- ✓ Patient education and early reevaluation (i.e., within 3–6 months) are necessary to identify and manage adverse effects, in an effort to improve compliance

- ✓ Patients should be instructed to immediately discontinue CHCs if they experience warning signs, ACHES (abdominal pain, chest pain, headaches, eye problems, and severe leg pain)

Drug Interactions

- ✓ The ACOG states that ampicillin, doxycycline, fluconazole, metronidazole, miconazole, fluoroquinolones, and tetracyclines do not decrease steroid levels in women taking OCs
- ✓ The Council on Scientific Affairs at the American Medical Association recommends that women **taking rifampin and griseofulvin should be counseled about the risk of OC failure and advised to use an additional non hormonal during and for 4 weeks after discontinuation of therapy**
- ✓ women who develop breakthrough bleeding during concomitant use of antibiotics and OCs (and other CHCs) should be advised to use an alternate method of contraception during the period of concomitant use

- ✓ Some anticonvulsants (mainly phenobarbital, carbamazepine, oxcarbazepine, primidone, phenytoin, topiramate) induce the metabolism of estrogen and progestin, inducing breakthrough bleeding and potentially reducing contraceptive efficacy
  - ✓ Alternative method
  - ✓ 50 mcg EE OCs

Missed dose instructions

- Forget to take one pill
  - Two pills on the day she remembers
  - Take the remaining pills as usual
  - Backup method is not necessary

- Two pills missed in a row in week 1 or 2 of her pack
  - Two pills on the day she remembers and two pills the next day
  - An alternative method of contraception for 7 days
  - May consider emergency contraception

- Two pills missed in a row during the third week (day 1 starter)
  - Discard the rest of the pack and start a new pack on that same day
  - An alternative method of contraception for 7 days

- Three or more pills missed in a row during the first 3 week (day 1 starter)
  - Discard the rest of the pack and start a new pack on that same day
  - An alternative method of contraception for 7 days

Return of fertility

- ✓ The average delay in ovulation after discontinuing OCs is 1 to 2 weeks, but delayed ovulation is more common in women with a history of irregular menses

- ✓ Traditionally, women are counseled to allow two to three normal menstrual periods before becoming pregnant to permit the reestablishment of menses and ovulation

Transdermal Patch

- ✓ As effective as combined OCs in patients weighing less than 90 kg
- ✓ Is not recommended as a first-line option for women weighing more than 90 kg
- ✓ Patch should be applied to the abdomen, buttocks, upper torso, or upper arm at the beginning of the menstrual cycle and replaced every week for 3 weeks (the fourth week is patch-free)

Vaginal Ring

- ✓ Over a 3-week period, the ring releases approximately 15 mcg/day of EE and 120 mcg/day of etonogestrel
- ✓ Comparative trials have shown the vaginal ring to be as effective as combined OCs
- ✓ On the first cycle of use, the ring should be inserted on or before the fifth day of the menstrual cycle, remain in place for 3 weeks, then removed for 1 week to allow for withdrawal bleeding
- ✓ In contrast to diaphragms and cervical caps, precise placement is not an issue

Long Acting Injectable Contraceptives

Sustained progestin exposure:

- ✓ Blocks the LH surge, thus preventing ovulation
- ✓ Should ovulation occur, progestins reduce ovum motility in the fallopian tubes
- ✓ Even if fertilization occurs, progestins thin the endometrium, reducing the chance of implantation
- ✓ Progestins also thicken the cervical mucus, producing a barrier to sperm penetration

Progestin-only methods Particularly benefit :

- ✓ Breast-feeding
- ✓ Those who are intolerant to estrogens (i.e., have a history of estrogen-related headache, breast tenderness, or nausea)
- ✓ Those with concomitant medical conditions in which estrogen is not recommended
- ✓ Injectable and implantable contraceptives are beneficial for women with compliance issues

Injectable Medroxyprogesterone Acetate

- ✓ Pregnancy failure rates with long acting progestin contraceptives are comparable to the rates with female sterilization

- ✓ DMPA 150 mg (Depo-Provera) is administered by deep intramuscular injection in the gluteal or deltoid muscle within 5 days of onset of menstrual bleeding and inhibits ovulation for more than 3 months

- ✓ With perfect use, the efficacy of DMPA is more than 99%; however, with typical use, 3% of women experience unintended pregnancy

- ✓ Although these injections may inhibit ovulation for up to 14 weeks, the dose should be repeated every 3 months (12 weeks) to ensure continuous contraception
- ✓ The manufacturer recommends excluding pregnancy in women with a lapse of 13 or more weeks between injections
- ✓ Although no adverse effects have been documented in infants exposed to DMPA through breast milk, the manufacturer recommends not initiating DMPA until 6 weeks postpartum in breastfeeding women

- Because return of fertility may be delayed after discontinuation of DMPA, it should not be recommended to women desiring pregnancy in the near future
- The median time to conception from the first omitted dose is 10 months
- Menstrual irregularities, including irregular, unpredictable spotting or, more rarely, continuous heavy bleeding, are the most frequent adverse effects
- Women who cannot tolerate prolonged bleeding may benefit from a short course of estrogen (e.g., 7 days of 0.625-2.5mg conjugated estrogen given orally)

Adverse effects:

- Breast tenderness, weight gain, and depression, occur less commonly (<5%)
- However, data suggest that DMPA may actually improve depression, and use of DMPA in women with depression may be appropriate with close monitoring
- Weight gain averages 1 kg annually and may not resolve until 6 to 8 months after the last injection
- Black box warning that addresses the association between DMPA use and decreased BMD, specifically in adolescent and young women
- WHO and ACOG guidelines recommend against the use of DXA in short and long-term DMPA users due to the limited clinical utility of monitoring BMD in this population
- DMPA has not been associated with the development of osteoporosis or fractures, and discontinuation of DMPA results in return to baseline BMD values within 12 to 30 months
- FDA added a black box warning to DMPA, recommending continued use of more than 2 years only if other contraceptive methods were inappropriate
- Calcium & Vit D, exercise

Subdermal Progestin Implant

- The Norplant contraceptive system was a set of six implantable, nonbiodegradable, soft silicone rubber capsules, each filled with 36mg crystalline levonorgestrel, that provided continuous contraception for up to 5 years
- Although extremely effective, Norplant was removed from the U.S. market in 2003 due to difficulty with insertion and removal
- Implanon is the progestin implant currently available in the United States

Intrauterine Device

- The low-grade intrauterine inflammation and increased prostaglandin formation caused by IUDs
- Endometrial suppression caused specifically by the progestin releasing IUD appear to be primarily spermicidal
- Although interference with implantation is a backup mechanism
- Efficacy rates with IUDs are greater than 99% with both perfect and typical use

Copper; Levonorgestrol

- Increased risk of infection appears to be related to introduction of bacteria into the genital tract during IUD insertion
- The risk is highest during the first 20 days after the procedure
- Ideal patients for IUD use :at least one child, who are monogamous and are not at risk for STDs or pelvic inflammatory disease, no history or risk of ectopic pregnancy

Emergency Contraception

- EC is used to prevent unwanted pregnancy after unprotected sexual intercourse (e.g., condom breakage, diaphragm dislodging, or sexual assault)

- Higher doses of combined estrogen and progestin or progestin-only containing products can be used

- Insertion of copper IUD is an option, although it is not an FDA approved or a widely used method of EC

- EC may prevent the fertilized egg from implanting into the endometrium, impaired sperm transport and corpus luteum function

- After intercourse, implantation of the fertilized egg typically takes approximately 5 days

Options for emergency contraception

Method	Dose	Reported efficacy
Levonorgestrel	0.75 mg given twice, 12 hours apart **or** 1.5 mg given as a single dose	59 to 94 percent of pregnancies prevented
Estrogen plus progesterone (Yuzpe regimen)	100 to 120 micrograms ethinyl estradiol plus 500 to 600 micrograms levonorgestrel in each dose, given twice, 12 hours apart	47 to 89 percent of pregnancies prevented
Mifepristone*	Single 600 mg dose	99 to 100 percent
Copper intrauterine device	Inserted within 120 hours after intercourse	at least 99 percent
Ulipristal	Single oral dose of 30 mg	98 to 99 percent


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