



Mansoura National University

HORMONAL CONTRACEPTIVES

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Learning Outcomes



By the end of the lecture, the students will be able to:

1. List different types of hormonal contraceptives
2. Describe different mechanisms of action of hormonal contraceptives
3. Enumerate adverse effects of hormonal contraceptives
4. List Contraindications of hormonal contraceptives
5. Recognize drug interactions that cause failure of contraception



Lecture outline

● ○ ○

Types of Hormomnal contraceptives

● ● ○

Mechanim of action

● ● ●

Adverse effects, contraindications and drug interactions

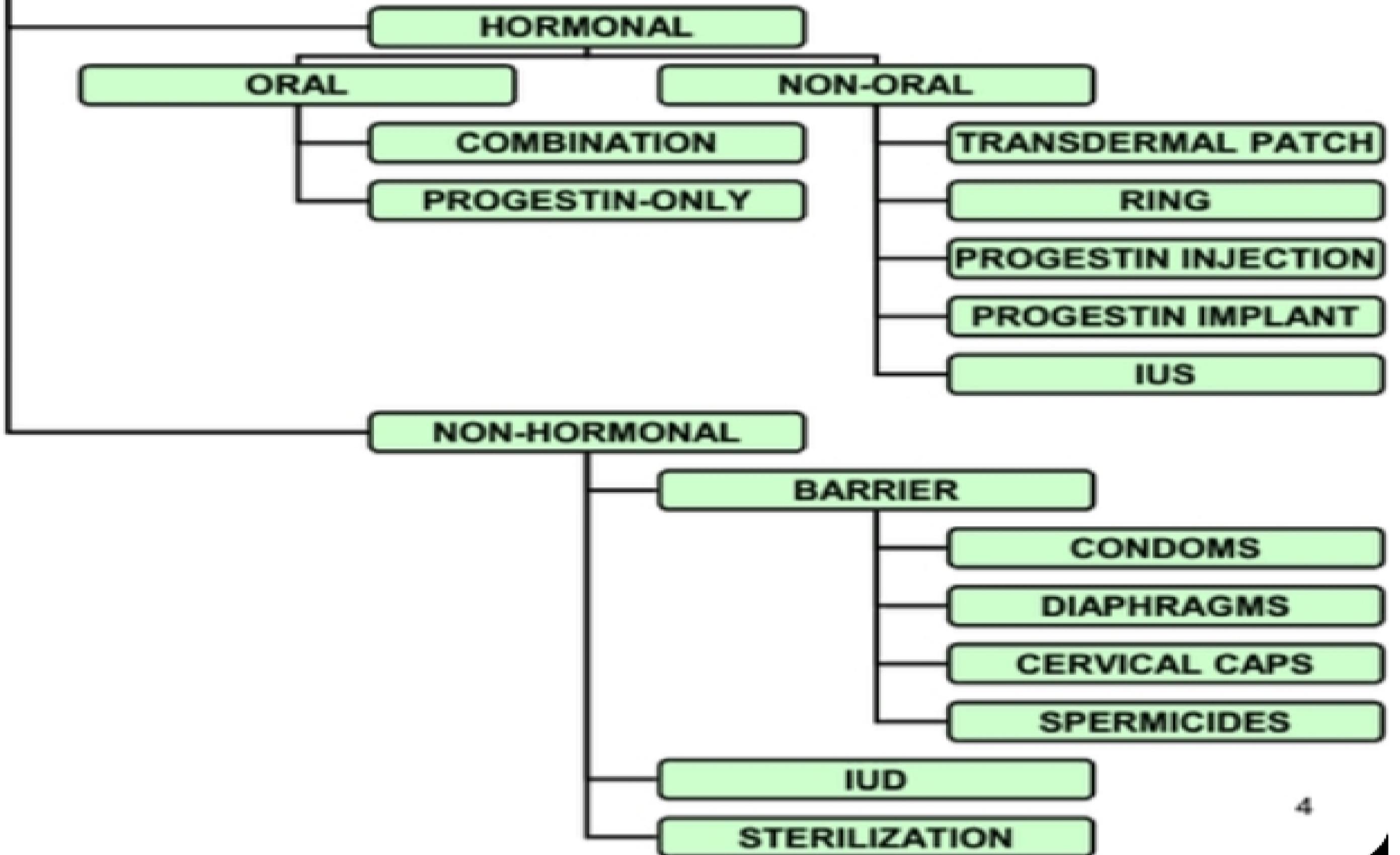


INTRODUCTION

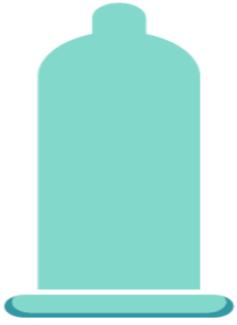
- Contraceptives are drugs, devices, or devices that release drugs that are used to prevent conception, the fertilization of the ovum by the sperm and resulting pregnancy.
- Thus, contraceptive methods may be hormonal or non-hormonal.



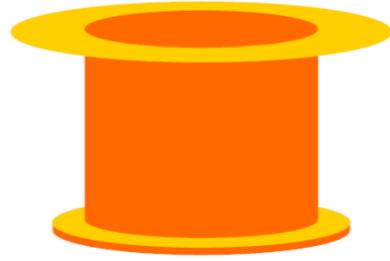
CONTRACEPTIVE METHOD



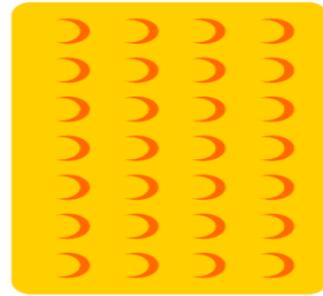
Contraception methods



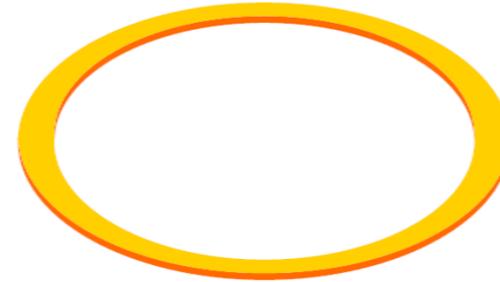
Condom



Female
condom



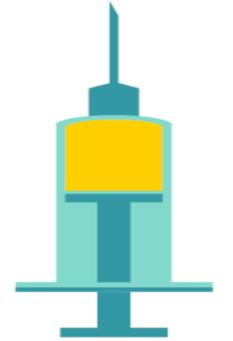
Oral
contraception



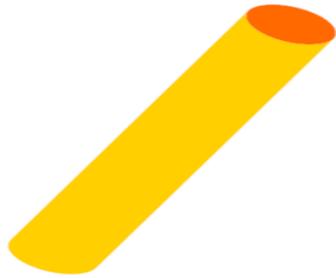
Hormonal ring



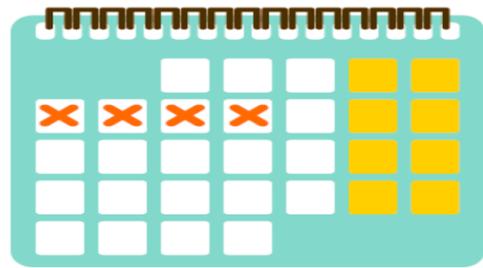
UID



Contraceptive
injection



Implant



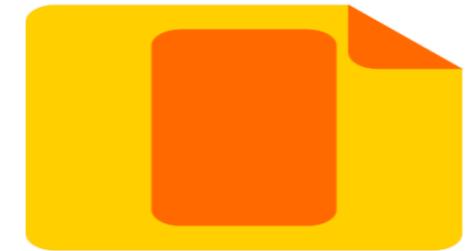
Calendar rhythm
method



Coitus
interruptus



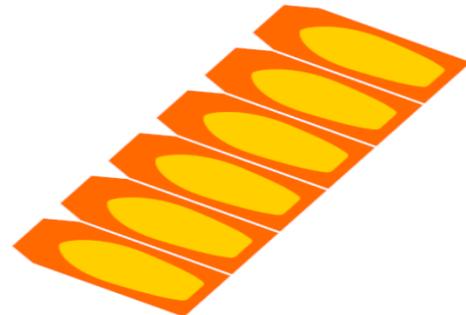
Vaginal
douche



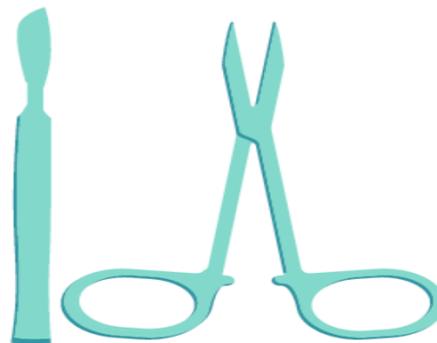
Contraceptive
patch



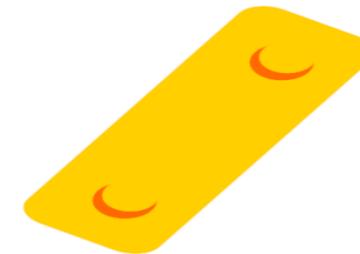
Spermicide



Suppositories



Surgical
sterilization



Emergency
contraception pills



Diaphragm / cap

HORMONAL CONTRACEPTIVES

Hormonal contraceptives may be:

A) Oral:

1. Combined regimen type
2. Single entity perpetrations

B) Non – oral:

1. Transdermal patch
2. Vaginal ring
3. Injectable progestin
4. Progestin implants
5. Progestin intrauterine system

ORAL CONTRACEPTIVES



ORAL CONTRACEPTIVES

- These are drugs taken orally to prevent conception.
- They are available in the following forms:
 - I. Combined regimen type
 - II. Single entity preparations

□ Combined regimen

- involves the administration of pills containing combination of Estrogen and Progestogen.
- With most oral contraceptives, active pills are taken for 21 to 24 days, followed by 4 to 7 days of placebo, for a total regimen of 28 days.
- The combination agents are further divided into monophasic forms (constant dosage of both components during the cycle) and biphasic or triphasic forms (dosage of one or both components is changed once or twice during the cycle).

□ Single entity preparations:

➤ Progestogen-only pills (POPs):

- A POPs (the mini-pill) is taken daily
- can be used in patients who are **breast-feeding** (doesn't affect lactation) or when estrogen is contraindicated.
- Major problems are a slightly higher failure rate and a much higher incidence of irregular bleeding.

➤ Emergency pills (postcoital pills or morning-after pills):

- is effective if taken within 72 hr of unprotected intercourse and repeated 12 h later.
- Nausea and vomiting are common



NON-ORAL CONTRACEPTIVES

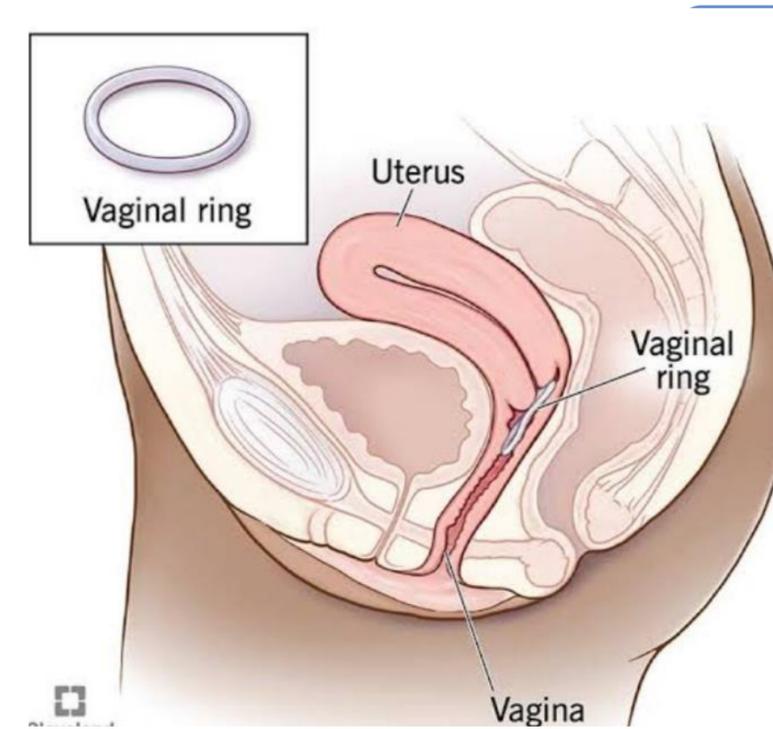
□ Transdermal patches

- Deliver **ethinyl estradiol** and **progestin**, through the skin.
- They are applied weekly for 3 weeks, one patch is applied each week to the abdomen, upper torso, or buttock.
- No patch worn during the fourth week to allow withdrawal bleeding.



□ A vaginal ring

- Containing **ethinyl estradiol** and **progestin**
- Continuous serum hormone levels can be achieved for longer periods of time.
- The ring is inserted for 3 weeks and then removed for 1 week to allow withdrawal bleeding.
- vaginal infections, and irritation are common



□ Injectable progestins:

- **Medroxyprogesterone** im every 3 months.
- Effective, safe and suitable for unreliable women.
- Menstrual irregularities, weight gain are common.
- Infertility may persist for many months after the final dose.



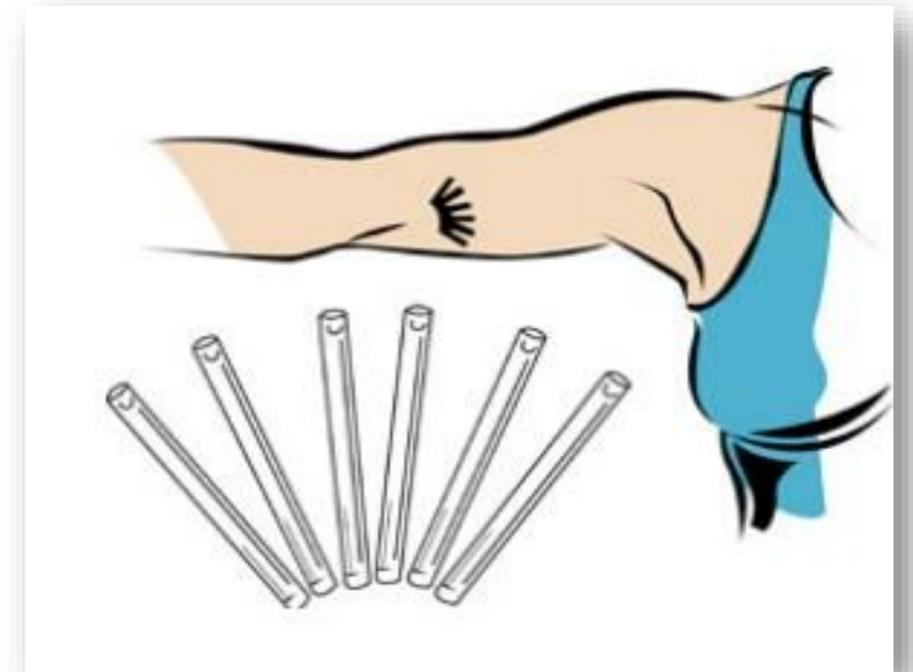
❑ Progestin implants

- placed subdermally, usually in the upper arm.
- Irregular bleeding and headache are common.

❑ Progestin intrauterine system

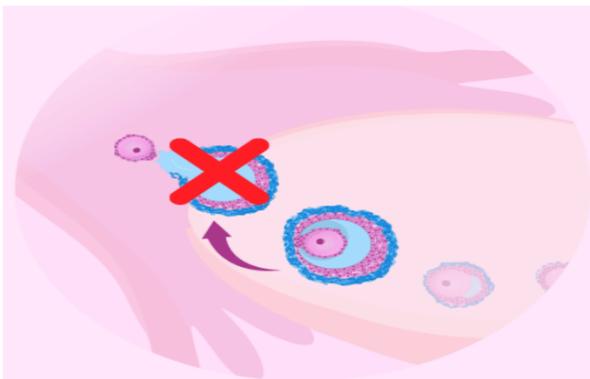
- Delivers low, continuous doses of **progestins** locally.
- Induces endometrial atrophy and decreases bleeding, which is a significant problem associated with standard copper containing devices.

❖ **Progestin implants** and **intrauterine devices** are known as long-acting reversible contraceptives as they are effective for 3 to 5 years and normal menstrual cycles and fertility return rapidly after removal.

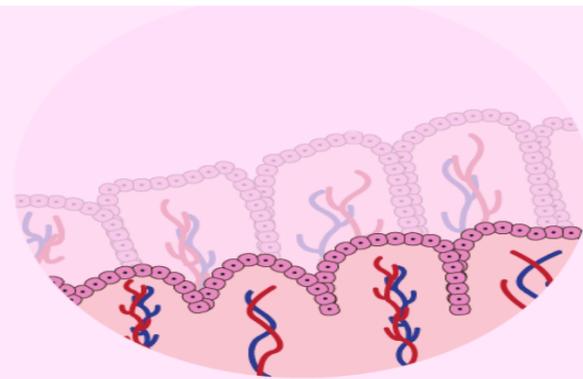


Mechanism of action

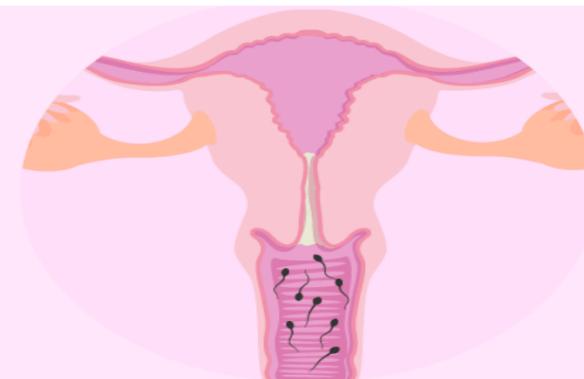
- Inhibit ovulation by exerting –ve feedback on LH (progesterone) and FSH (estrogen) secretion.
- Produce endometrial changes and interfere with coordinated contraction of the cervix, uterus, and fallopian tubes → ↓ sperm transport and fertilization.
- Increase thickness of cervical mucus to prevent sperm penetration.



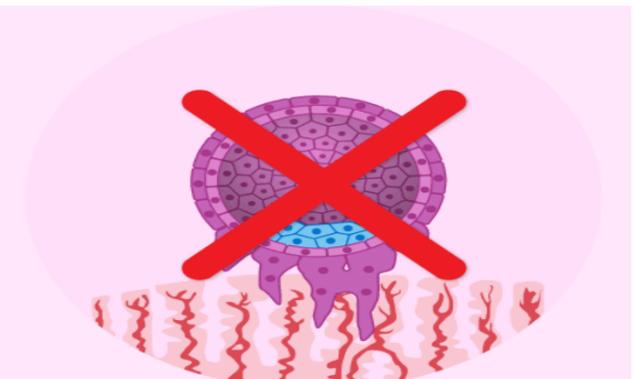
Prevent
ovulation



Disrupt the
endometrium



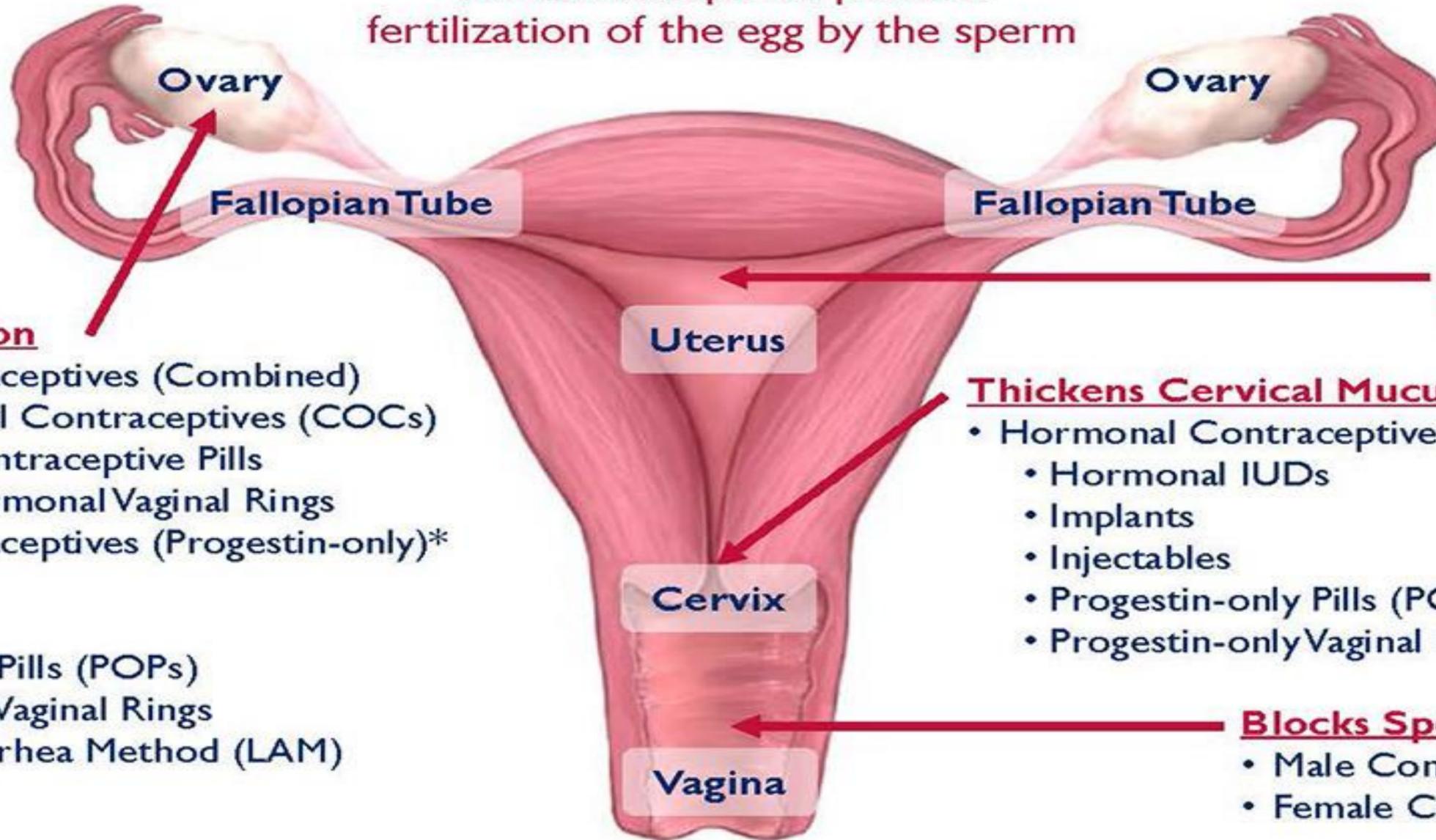
Modify cervical
mucus



Not allowing
implantation

How Contraception Works: Mechanisms of Action

All contraceptives prevent fertilization of the egg by the sperm



Prevents Ovulation

- Hormonal Contraceptives (Combined)
 - Combined Oral Contraceptives (COCs)
 - Emergency Contraceptive Pills
 - Combined Hormonal Vaginal Rings
- Hormonal Contraceptives (Progestin-only)*
 - Implants
 - Injectables
 - Progestin-only Pills (POPs)
 - Progestin-only Vaginal Rings
- Lactation Amenorrhea Method (LAM)

Incapacitates Sperm

- Copper IUD †

Thickens Cervical Mucus

- Hormonal Contraceptives (Progestin-only)*
 - Hormonal IUDs
 - Implants
 - Injectables
 - Progestin-only Pills (POPs)
 - Progestin-only Vaginal Rings

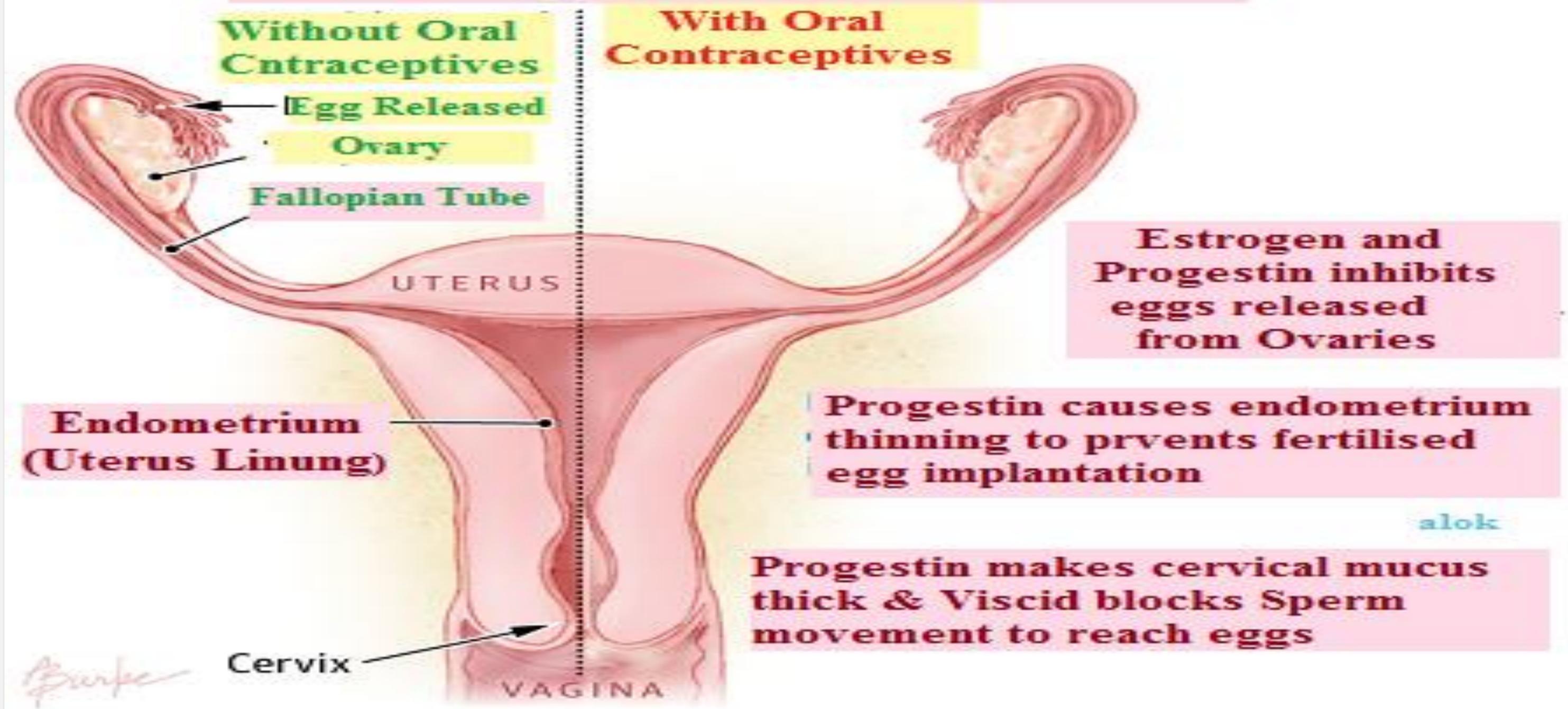
Blocks Sperm

- Male Condoms
- Female Condoms

* Progestin-only hormonal methods have more than one mechanism of action.

† The Copper IUD works by preventing fertilization but in very rare instances, if used as Emergency Contraception, it may prevent implantation of a fertilized egg.

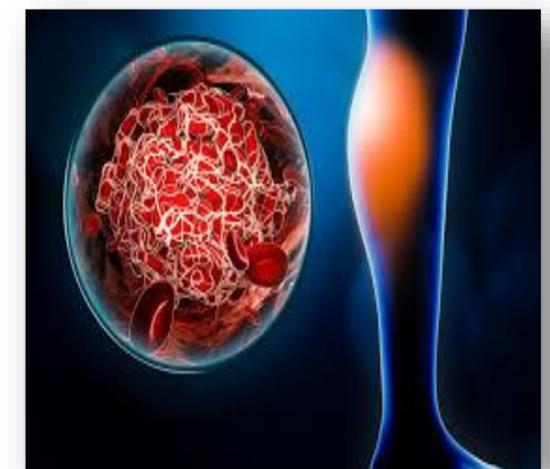
Oral Contraceptives: Mechanism of Action



Surfer

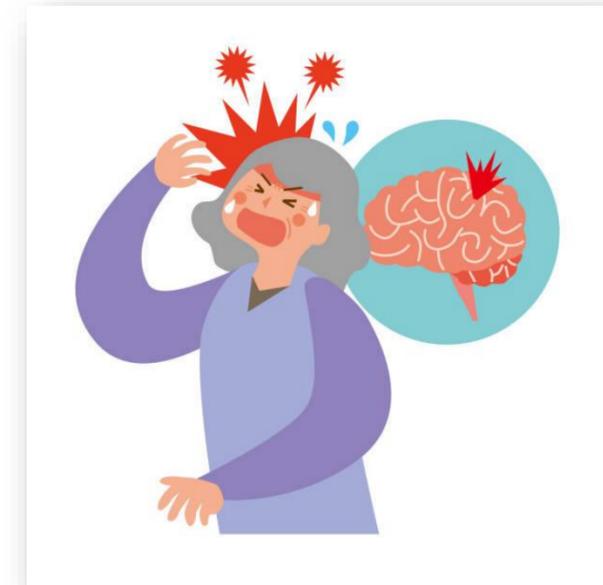
SIDE EFFECTS

- **CVS** (combined hormonal contraceptive):
 - The most serious side effects especially in women above 35 years and in women who are smokers:
 - i. Hypertension
 - ii. increase risk of myocardial infarction.
 - iii. **Thrombosis and thromboembolic catastrophes.**



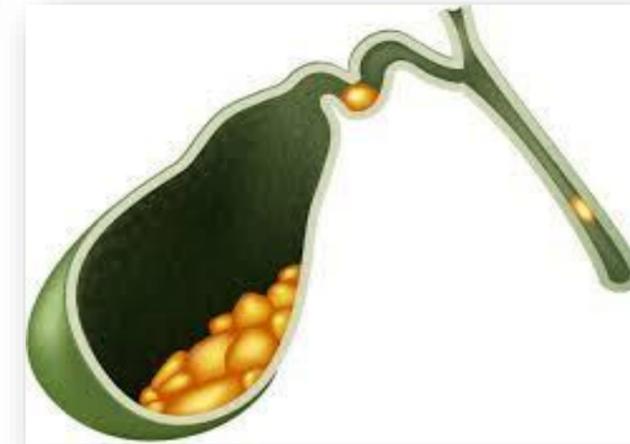
➤ **CNS:**

- Migraine headache (combined hormonal contraceptive).
- Ischemic stroke (combined hormonal contraceptive).
- Mood changes and depression.



➤ **GIT:**

- Nausea and vomiting.
- Cholecystitis and gall stones.
- Cholestatic hepatitis and hepatotoxicity.



➤ Endocrinal:

- Hyperglycemia and DM.
- Weight gain and edema due to salt and water retention.
- Inhibition of lactation in lactating women (combined hormonal contraceptive).



➤ Endocrinal:

- Menstrual irregularities: spotting bleeding, breakthrough bleeding, amenorrhea, and dysmenorrhoea.
- Acne and hirsutism.



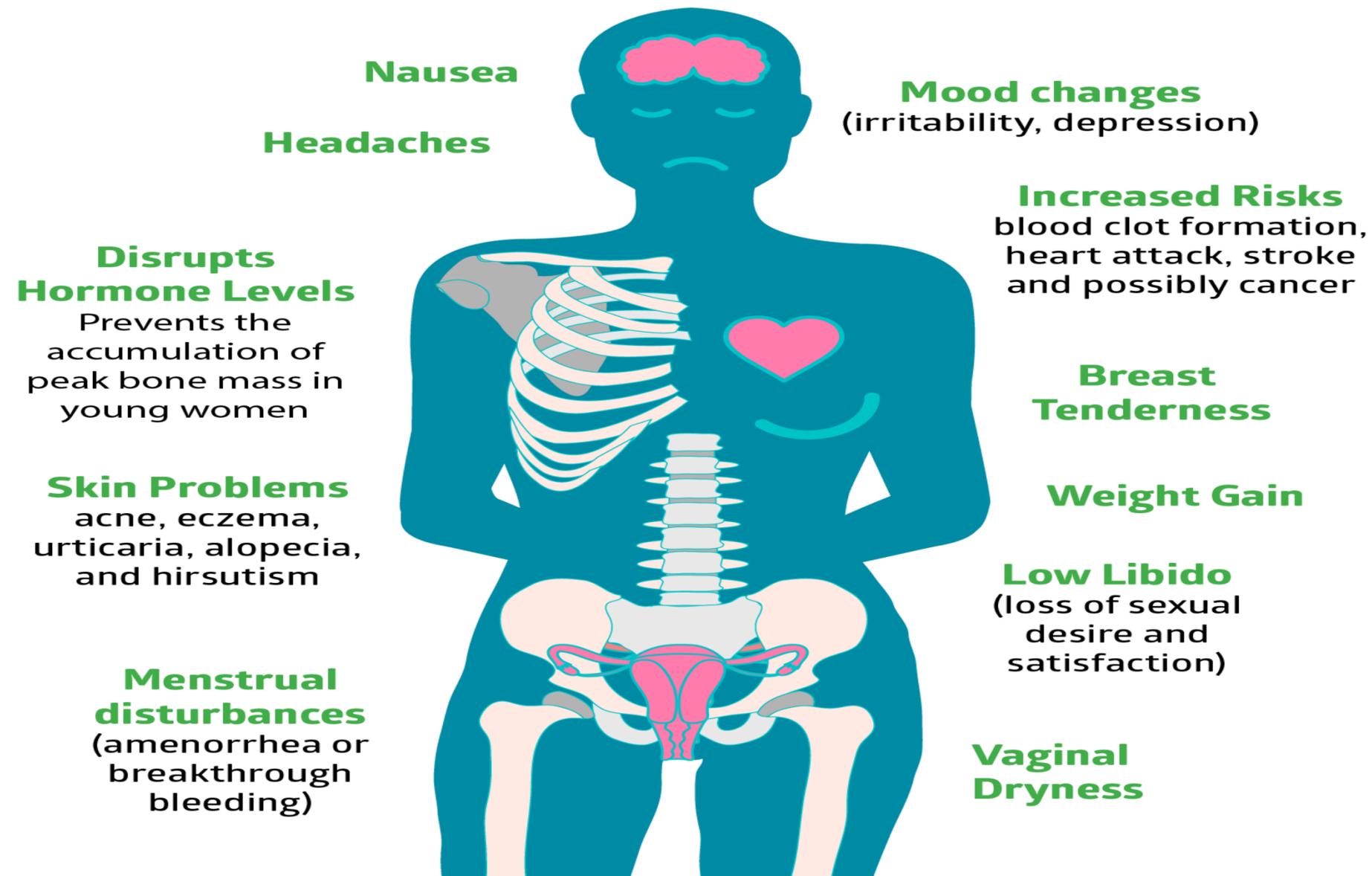
➤ Cancer (combined hormonal contraceptives):

- Increased risk of breast cancer.



- ❖ **N.B:** By contrast, the combined contraceptives reduces the risk of ovarian cancer and endometrial cancer

Common Side Effects of Hormonal Contraceptives

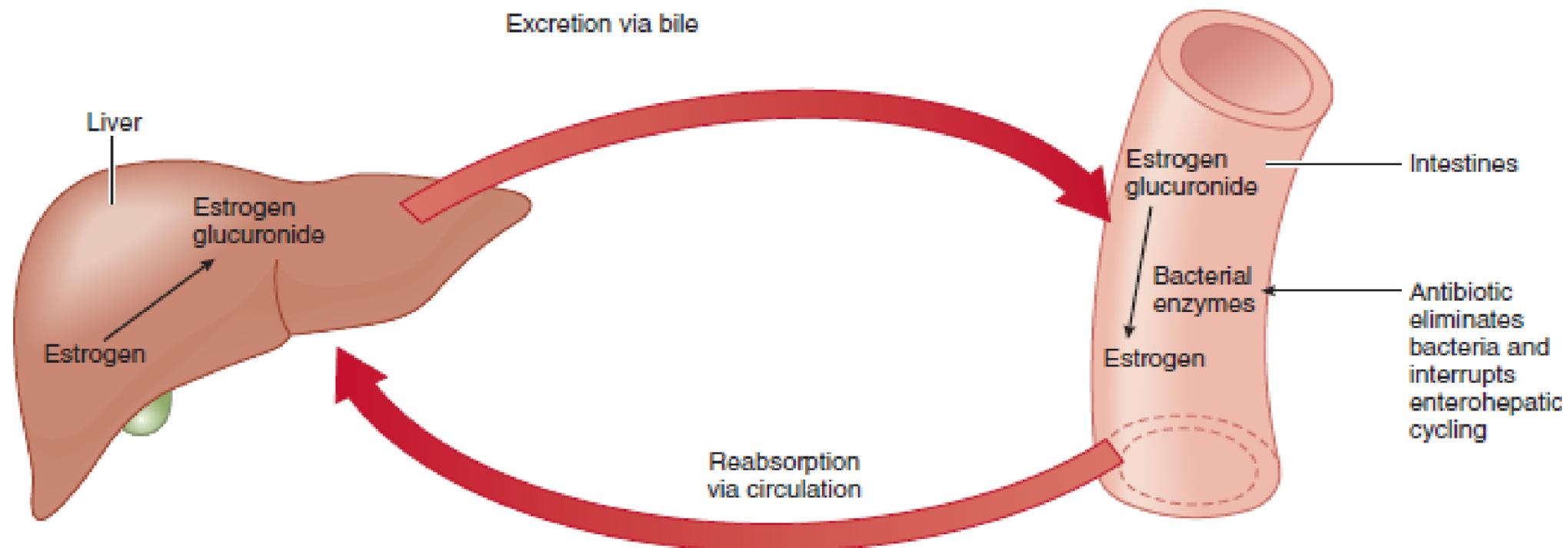


CONTRAINDICATIONS OF COMBINED CONTRACEPTIVES

- Hypertension or ischemic heart disease (IHD).
- History of embolism, thrombosis or cerebral hemorrhage.
- History of cancer breast or estrogen-dependent neoplasm.
- Migraine headache.
- Chronic liver disease and gall stones.
- Diabetes mellitus.
- Obese, smokers, or women over 35 years.
- Depression.

❑ Drug-interactions that cause failure of contraception:

- If taken with enzyme inducers e.g. rifampin, phenytoin, etc.
- If woman taking broad spectrum antibiotics e.g tetracyclines (kill bacteria flora)
- Paraffin oil (laxative) ↓ intestinal absorption of contraceptive pills.





A young female adherent to oral contraceptive pills got **pregnant**. A 7-days course of cephalosporins (a broad-spectrum antibiotic) was prescribed for her as she was complaining of cough and fever.

Give an explanation.

References

- Rang & Dale's Pharmacology, 10th Edition 2024 - [ClinicalKey Student]. Retrieved from: The reproductive system - Rang & Dale's Pharmacology - ClinicalKey Student
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Thank
you