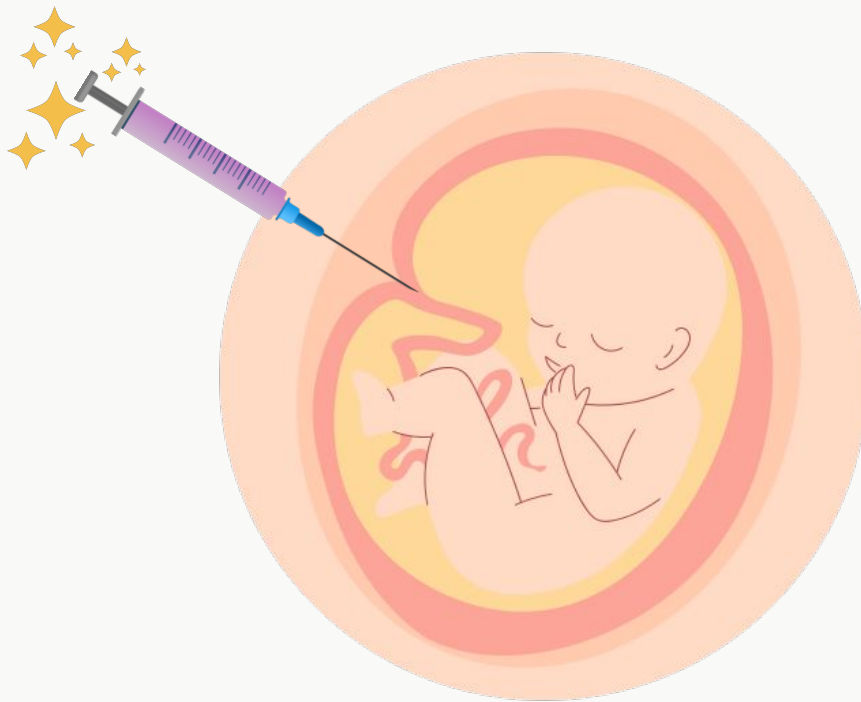


Oral and other forms of contraception

Dr. Alaa Alanteet | Dr. Mohammed Almutairi



- Main text
- Male slide
- Female slide
- Important
- Dr, notes
- Extra info

EDITING FILE

Objectives



Perceive the different contraceptive utilities available.



Classify them according to their site and mechanism of action.



Justify the existing hormonal contraceptives present.



Compare between the types of oral contraceptives pills with respect to MOA, formulations, indications, ADRs, CI. and possible interactions.



Hint on characteristics & efficacies of other hormonal modalities.

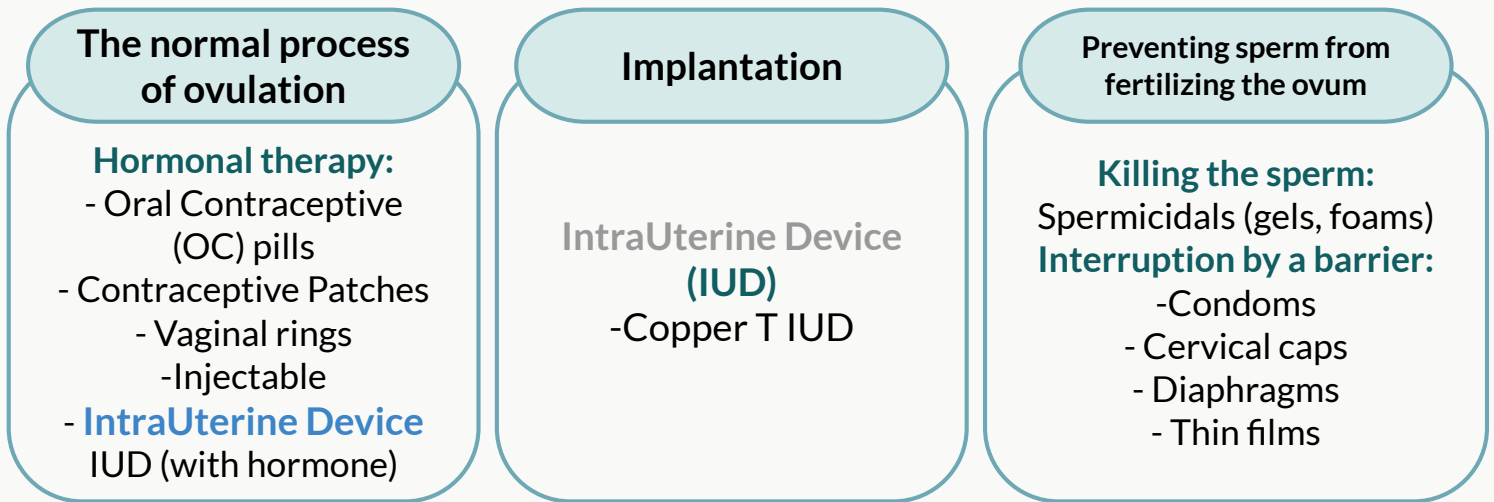
Introduction

Conception & Contraception

Conception: Fusion of the sperm & ovum to produce a new organism.

Contraception: Preventing this fusion to occur.

Contraception can be achieved by interfering with:



Types Of Oral Contraceptive (OC) Pills According to composition & intent of use

Hormonal control of the female reproductive system
You should know that estrogen and progesterone cause a negative feedback on the release of LH & FSH.
[Click here to see the picture](#)

Combined Pills (COC)

Contain **estrogen & progestin**
(Almost 100% effective)

Mini Pills (POP)

Contain **only a progestin**
(Almost 97% effective)

Morning-After Pills

- Contain both hormones (estrogen & progestin)
- Contain a high dose of one hormone
- Contain Mifepristone (Antiprogestin)+ Misoprostol (Pg)

Estrogens

Ethinyl estradiol or Mestranol (a "prodrug" converted to ethinyl estradiol).
Currently concentration used now is very low to minimize estrogen **hazards/Side effect**.
"has more ADRs than progestins"

Progestins

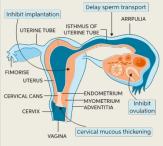
(synthetic progesterone)

Drugs with a **systemic androgenic effect (acne, hirsutism, weight gain):**
Norethindrone, Levonorgestrel (Norgestrel) & Medroxyprogesterone acetate.
Progestins are testosterone derivatives thus producing testosterone like effects

Drugs with **NO systemic androgenic effect (Currently used to avoid side effects):**
Norgestimate, Desogestrel and Drospirenone.

Combined Oral Contraceptives (COC) *(contain both estrogen & progestin)*

M.O.A



- **Inhibit ovulation** by suppressing the release of gonadotropins (FSH & LH) → no action on the ovary → ovulation is prevented. *“by negative feedback”* (used in PCOS because it decreases LH)
- **Inhibit implantation** by causing abnormal contraction of the fallopian tubes & uterine musculature → ovum will be expelled rather than implanted.
- **Increase viscosity of the cervical mucus** making it so viscous → **no sperm pass.**
- **Abnormal transport time** through the fallopian tubes. *“due to the increased cervical viscosity”*

Monthly pills:

Method of administration:

- Pills are better taken **at the same time of day.**
- For 21 days; starting on day 5 / ending at day 26, this is followed by a 7 day pill free period.
- **To improve compliance** *(because they may forget taking them after period); a formulation of 28 pills:*
 - The first 21 pills are medicated, followed by the last 7 pills (dummy/placebo pills).
- Currently, their formulation is improved to mimic the natural ongoing changes in hormonal profile. Accordingly there are **3 Phase formulations:** [Click here to see the example from slide.](#)
- **Monophasic** (1 fixed dose) → a **fixed** amount of estrogen & progestin. (E.g **Loestrin**)
- **Biphasic** (2 doses) → a **fixed** amount of **estrogen**, while amount of **progestin increases** stepwise in the second half of the cycle (E.g **jenest-28**)
- **Triphasic** (3 doses) → amount of **estrogen; fixed or variable** & amount of **progestin increases** stepwise in 3 phases. (E.g **Triphasil**) *“each week contains a different concentration”*

Admin. administration

Seasonal pills:

- Are known as **Continuous / Extended cycle** → **Cover 91 days schedule** *(long duration)* (taken continuously for **84 days** and then **break for 7 days.**)
- Has very **low doses of both estrogens and progestins** *“less ADRs”*
 - **Advantage:** It lessens menstrual periods to 4 times a year (1 period every 3 months), useful in those who have pain from endometriosis and can prevent migraines during period.
 - **Disadvantages:** Higher incidence of **breakthrough bleeding** during early use.

Estrogen related

- *tissue growth → breast mass may increase causing pain”*
- Headache
- Nausea and **breast tenderness**
- **↑Skin Pigmentation.**
- **Impair glucose tolerance** (hyperglycemia).
- **↑Incidence of breast, vaginal & cervical cancer.** *“Estrogen induce tissue growth → if uncontrolled may lead to cancer/tumor”*
- Cardiovascular - **major concern:**
 - **Thromboembolism**
 - **Hypertension** *“vasoconstriction/sodium and water retention”*
- **↑Frequency of gallbladder disease.** *“induces gallbladder secretions → ↑ chance of gallstones”*

Progestin related

- Nausea, vomiting & headache.
- Slightly higher failure rate.
- Fatigue.
- **Depression of mood.** *“change in hormones”*
- **Menstrual irregularities.**
- **Weight gain.** *“androgenic effect/water retention”*
- **Hirsutism.** *“androgenic effect”*
- **Masculinization** (Norethindrone) *“androgenic effect”*
- Ectopic pregnancy **rare.**

ADRs

#

- **Thromboembolic disorders** /thrombophlebitis.
- CHF or other causes of **edema.**
- **Vaginal bleeding** of undiagnosed etiology.
- Known or suspected **breast cancer** *due to family history*, or estrogen-dependent neoplasms.
- **Lactating mothers (mini pills), Obese Females, Smokers and Females above 35 years** → **better given progestin only pills.**
- Known or suspected pregnancy, or estrogen dependent neoplasm .
- Impaired hepatic functions.
- Dyslipidemia, diabetes, hypertension, migraine.

Cont.. Combined Oral Contraceptives (COC)

D.D.I. Interactions	<i>Medications that cause contraceptive failure: (i.e impairing absorption & CYT P450 inducers)</i>
	<ul style="list-style-type: none"> → Antibiotics that interfere with normal GI flora → ↓ absorption and ↓ enterohepatic recycling → ↓ its bioavailability. → Microsomal Enzyme <u>Inducers</u> → ↑ catabolism of OC, (e.g. Phenytoin, Phenobarbitone, Rifampin).
	<i>Medications that ↑ COC toxicity: (i.e. CYT P450 inhibitors)</i>
	<ul style="list-style-type: none"> → Microsomal Enzyme <u>Inhibitors</u>; ↓ metabolism of OC → ↑ toxicity, (e.g. Acetaminophen, Erythromycin, SSRIs "used in depression").
	<i>Medications of altered clearance (↓) by COC: ↑ toxicity</i>
	<ul style="list-style-type: none"> → Warfarin "↑ bleeding", Cyclosporine, Theophylline.

Mini Pills - progestin only Pills (POP)

<p>Systemic androgenic effect: Norethindrone, Levonorgestrel (Norgestrel), Medroxyprogesterone acetate, No systemic androgenic effect: Norgestimate, Desogestrel & Drospirenone.</p>	
M.O.A.	Increase cervical mucus , so no sperm penetration & therefore, no fertilization.
Indications	Are alternative when estrogen is contraindicated (e.g. during breastfeeding, hypertension, cancers that induced by estrogen, smokers and female over the age of 35, obese females).
Admin.	<ul style="list-style-type: none"> ● Should be taken every day, the same time, all year round. ● I.M injection e.g. Medroxyprogesterone acetate 150 mg every 3 months.

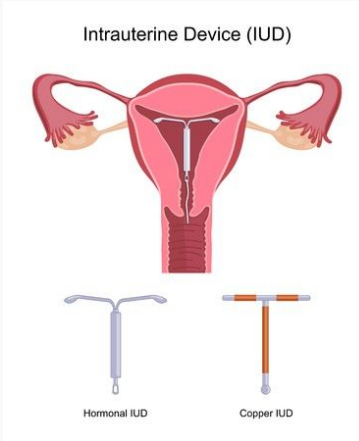



Morning-After Pills

Indications	<ul style="list-style-type: none"> ● Emergency or Post Coital Contraception. (Coital=sexual intercourse) ● When desirability for avoiding pregnancy is obvious: <ul style="list-style-type: none"> - Unsuccessful withdrawal before ejaculation. - Torn, leaking condom. - Missed pills. - Exposure to teratogen e.g. Live vaccine. - Rape.
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Morning-after pills (Post Coital Contraception or Emergency Contraception) (1)

Composition	Method of Administration	Timing of 1st dose After Intercourse	Reported Efficacy
Ethinyl estadiol + Levonorgestrel	2 tablets BID with 12 hrs in between	0- 72hrs Not effective after that	75%
High-dose only Ethinyl estadiol	BID(2 times a day) for 5 days		75 - 85%
High dose only levonorgestrel			70 - 75%
Mifepristone (Antiprogesterin) ± Misoprostol (Prostaglandin analogue)	A single dose "Causes contractions → expels ovum"	0- 120 hrs	85 - 100% Highest efficacy

Other Methods of Contraception

Method	Info.	Picture
IntraUterine Device (IUD)	<ul style="list-style-type: none">● M.O.A:<ul style="list-style-type: none">○ Changing the lining of the uterus making it unsuitable for a pregnancy.○ Thickening the mucus of the cervix, preventing sperm from entering the uterus.→ Hormonal IUD: It is T-shaped, made of plastic and steadily releases small amounts of the progestogen directly into the uterus.→ Copper T IUD: Uses copper to prevent pregnancy "<i>kills sperm</i>"	 <p>Intrauterine Device (IUD)</p> <p>The diagram shows a cross-section of the female reproductive system with the uterus highlighted. Below it, two T-shaped IUDs are shown: a Hormonal IUD (light blue) and a Copper IUD (orange).</p>
Contraceptive Diaphragm	Covers the cervix, so sperm cannot get into the uterus.	 <p>A hand is shown holding a purple, dome-shaped contraceptive diaphragm.</p>
Vaginal Ring	Releases a continuous dose of the hormones estrogen and progestin, the hormones are absorbed into the bloodstream: <ul style="list-style-type: none">● Prevent ovulation.● Cause the cervical mucus to thicken and alter sperm movement	 <p>A hand is shown holding a white, ring-shaped vaginal ring.</p>
Condoms	<ul style="list-style-type: none">● Internal female condoms.● External male condoms.	 <p>A hand is shown holding a yellow, ring-shaped internal female condom.</p>

Team leaders

Sarah Alajaji

Maryam Alghannam

Team members

Sarah Aldossary

Sultan Almishrafi

Lama Hazzaa

Omar Banjar

Aroub Almahmoud

Fatimah Alghamdi

Layan Al-Ruwaili

Naif Alateeq

Mohammed Alhudaithi

Rahaf Alslimah



Mansour Alotaibi



Wasan Alanazi

Lama Alotaibi

Sultan Albaqami

Ghaida Aldossary

Fahad Aldhafian

Zeyad Alotaibi

Alanoud Alolaywah

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