



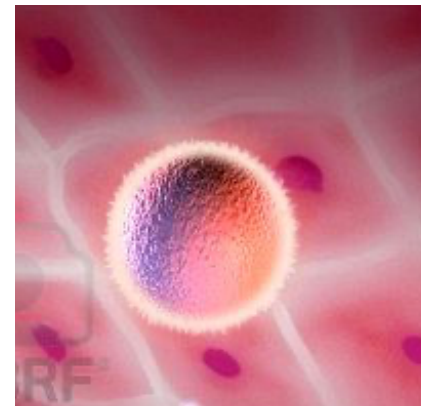
# Oral and Other Contraceptives

# Objectives

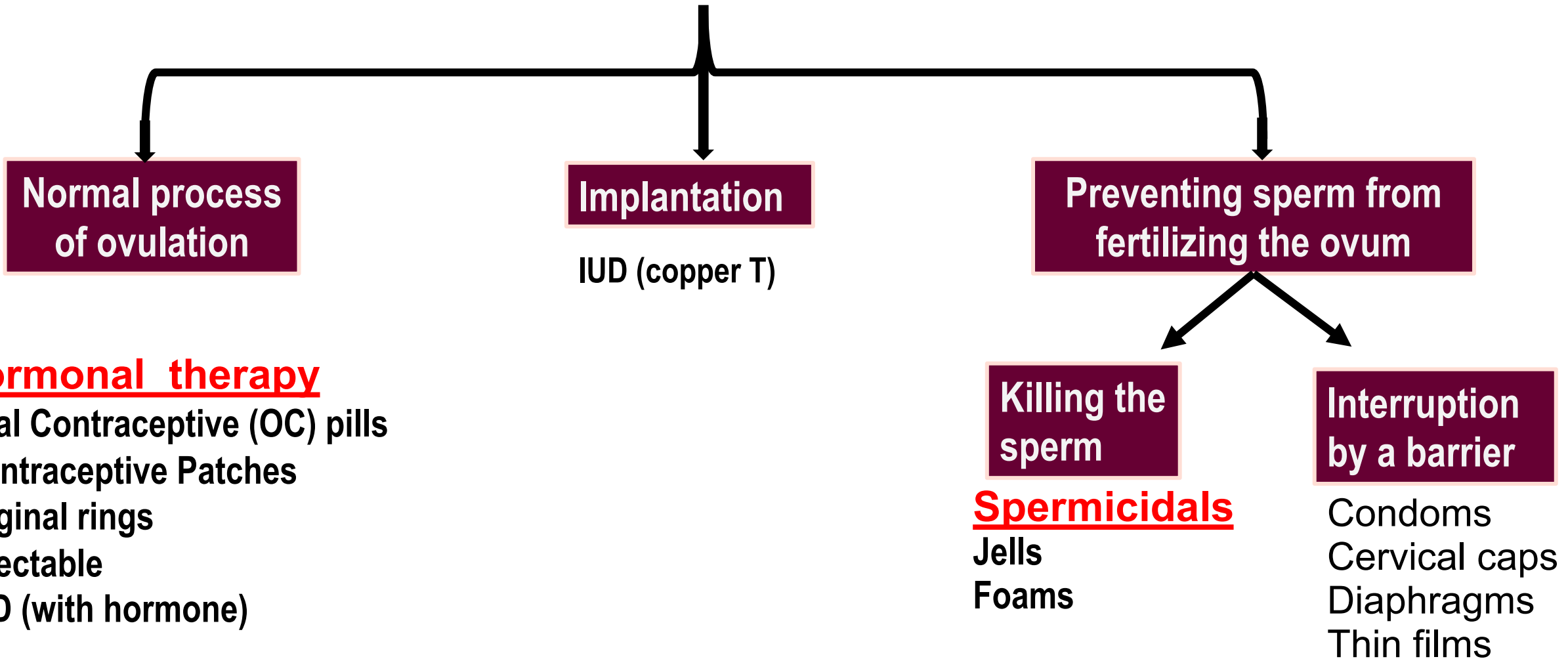
- Perceive the different contraceptive utilities available
- Classify them according to their site and mechanism of action
- Justify the existing hormonal contraceptives present
- Compare between the types of oral contraceptives pills with respect to mechanism of action, formulations, indications, adverse effects, contraindications and possible interactions
- Hint on characteristics & efficacies of other hormonal modalities

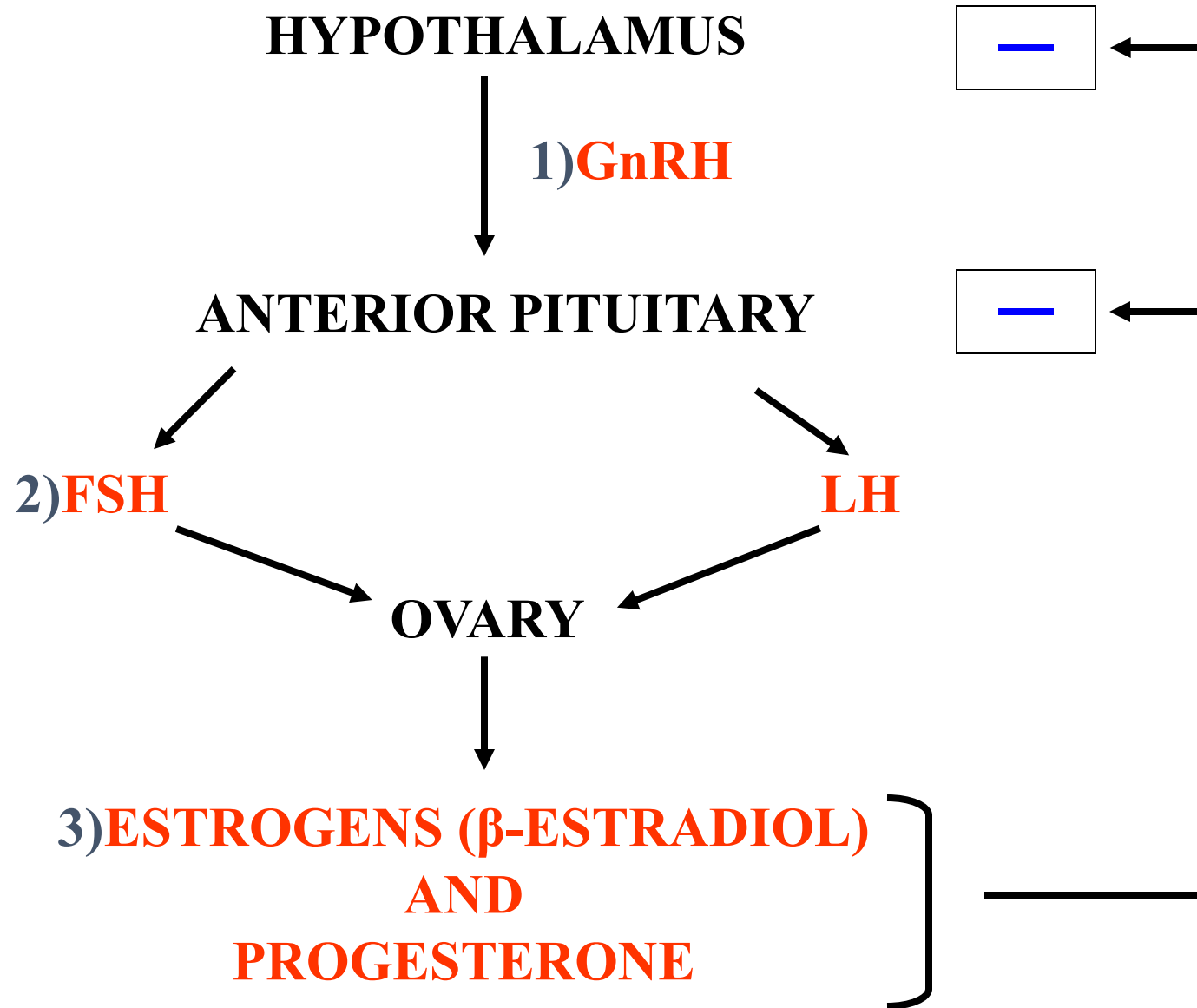
# Introduction

- **IN CONCEPTION** → there is fusion of the sperm & ovum to produce a new organism.
- **IN CONTRACEPTION** → we are preventing this fusion to occur

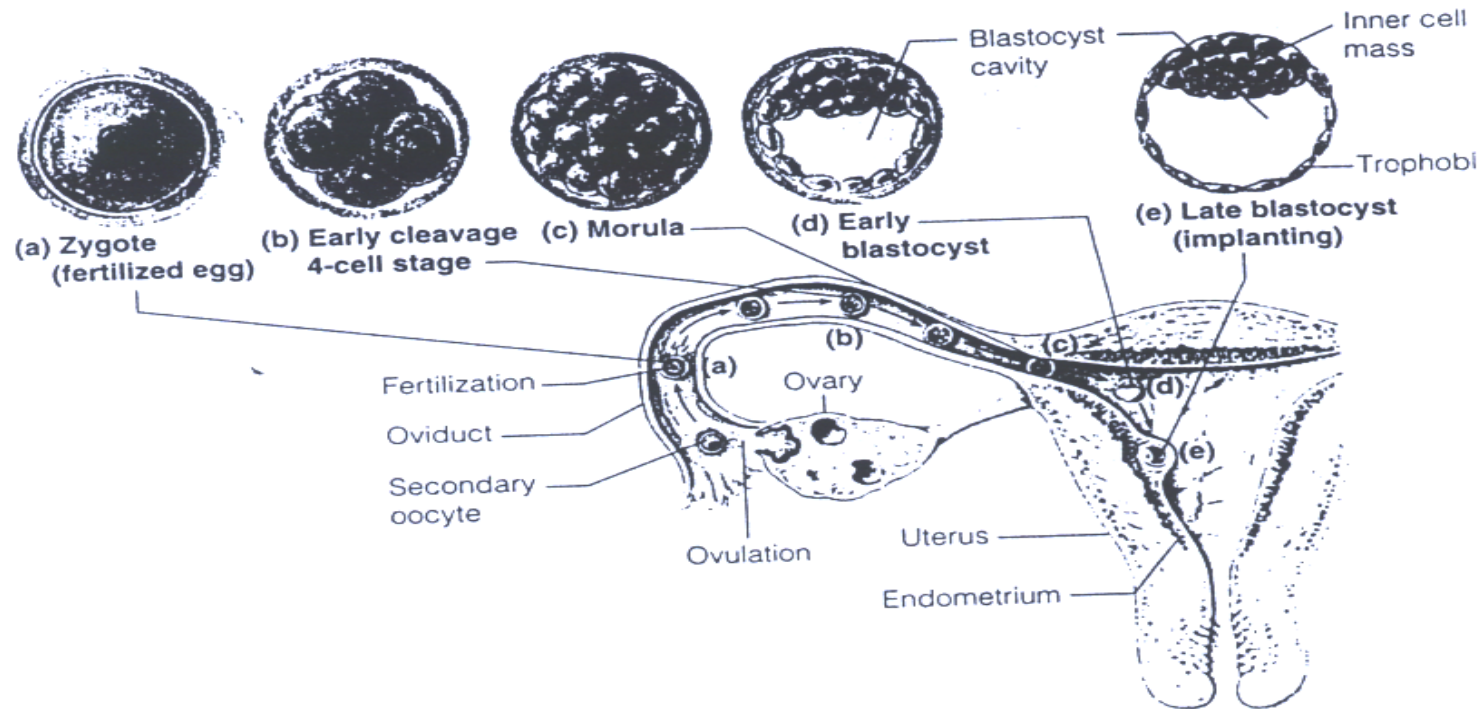
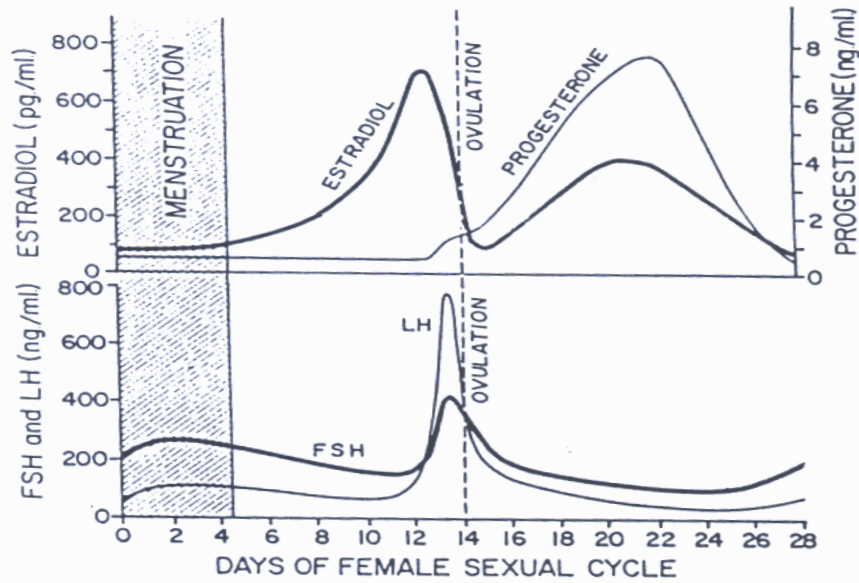


# Contraception achieved by interfering with:





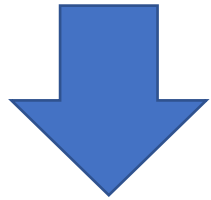
## Plasma concentrations of the gonadotropins & ovarian hormones during the normal female sexual cycle



# Types ORAL CONTRACEPTIVE (OC) Pills According to composition & intent of use

## COMBINED Pills (COC)

Contain estrogen & progestin (100% effective)



ESTROGENS

- Ethinyl estradiol or mestranol [*a “prodrug” converted to ethinyl estradiol*]
- Currently concentration used now is very low to minimize estrogen hazards

PROGESTINS

- Norethindrone, Levonorgestrel (*Norgestrel*), and Medroxyprogesterone acetate
- Has systemic androgenic effect; acne, hirsutism, weight gain.

Currently

- Norgestimate, Desogestrel, and Drospirenone
- Has no systemic androgenic effect

## MINI Pills (POP)

Contain only a progestin (97%effective)

## MORNING-AFTER Pills

Contain both hormones or Each one alone (high dose) or Mifepristone (Antiprogestin) ± Misoprostol (Pg)

# Combined Oral Contraceptives (COC):

- Mechanism of Action:
- **Inhibit ovulation** by SUPPRESSING THE RELEASE OF GONADOTROPHINS (FSH & LH) → no action on the ovary → ovulation is prevented.
- **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.





# Combined Oral Contraceptives (COC):

- Seasonal Pills
- Are known as Continuous / Extended cycle → **Cover 91 days schedule**
- **Taken continuously for 84 days, break for 7 days**
- Has very low doses of both estrogens and progestins
- Benefit: 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.

# Combined Oral Contraceptives (COC):

- Monthly Pills
- Currently, their formulation is improved to mimic the natural on going changes in hormonal profile.
- Accordingly we have now the phase formulations
  1. **Monophasic** → (a fixed amount of estrogen & progestin)
  2. **Biphasic** (2 doses) → (a fixed amount of estrogen, while amount of progestin increases stepwise in the second half of the cycle)
  3. **Triphasic** (3 doses) → (amount of estrogen; fixed or variable & amount of progestin increases stepwise in 3 phases).

	<b>Estrogen (mg)</b>		<b>Progestin (mg)</b>	
<b>Monophasic combination tablets</b>				
Loestrin 21 1/20	Ethinyl estradiol	0.02	Norethindrone acetate	1.0
Desogen, Apri, Ortho-Cept	Ethinyl estradiol	0.03	Desogestrel	0.15
Brevicon, Modicon, Necon 0.5/35	Ethinyl estradiol	0.035	Norethindrone	0.5
Demulen 1/35	Ethinyl estradiol	0.035	Ethynodiol diacetate	1.0
Nelova 1/35 E, Ortho-Novum 1/35	Ethinyl estradiol	0.035	Norethindrone	1.0
Ovcon 35	Ethinyl estradiol	0.035	Norethindrone	0.4
Demulen 1/50	Ethinyl estradiol	0.05	Ethynodiol diacetate	1.0
Ovcon 50	Ethinyl estradiol	0.05	Norethindrone	1.0
Ovral-28	Ethinyl estradiol	0.05	D,L-Norgestrel	0.5
Norinyl 1/50, Ortho-Novum 1/50	Mestranol	0.05	Norethindrone	1.0
<b>Biphasic combination tablets</b>				
Jenest-28, Ortho-Novum 10/11, Necon 10/11, Nelova 10/11				
Days 1—10	Ethinyl estradiol	0.035	Norethindrone	0.5
Days 11—21	Ethinyl estradiol	0.035	Norethindrone	1.0

	<b>Estrogen (mg)</b>		<b>Progestin (mg)</b>	
<b>Triphasic combination tablets</b>				
<b>Triphasil, Tri-Levlen, Trivora</b>				
Days 1—6	Ethinyl estradiol	0.03	L-Norgestrel	0.05
Days 7—11	Ethinyl estradiol	0.04	L-Norgestrel	0.075
Days 12—21	Ethinyl estradiol	0.03	L-Norgestrel	0.125
<b>Ortho-Novum 7/7/7, Necon 7/7/7</b>				
Days 1—7	Ethinyl estradiol	0.035	Norethindrone	0.5
Days 8—14	Ethinyl estradiol	0.035	Norethindrone	0.75
Days 15—21	Ethinyl estradiol	0.035	Norethindrone	1.0
<b>Ortho-TrI-Cyclen</b>				
Days 1—7	Ethinyl estradiol	0.035	Norgestimate	0.18
Days 8—14	Ethinyl estradiol	0.035	Norgestimate	0.215
Days 15—21	Ethinyl estradiol	0.035	Norgestimate	0.25

# Combined Oral Contraceptives (COC): (Adverse Drug Reactions)

## A. Estrogen Related

- Nausea and breast tenderness
- Headache
- ↑ Skin Pigmentation
- Impair glucose tolerance (hyperglycemia)
- ↑ incidence of breast, vaginal & cervical cancer??
- Cardiovascular - major concern
  - a. Thromboembolism
  - b. Hypertension
- ↑ frequency of gall bladder disease

## B. Progestin Related

- Nausea, vomiting & headache
- Slightly higher failure rate
- Fatigue
- Depression of mood
- Menstrual irregularities
- Weight gain
- Hirsutism
- Masculinization (Norethindrone)
- Ectopic pregnancy.

# Combined Oral Contraceptives (COC): (Contraindications of estrogen containing pills)

- Thrombophlebitis / thromboembolic disorders
- CHF or other causes of edema
- Vaginal bleeding of undiagnosed etiology
- Known or suspected pregnancy
- Known or suspected breast cancer, or estrogen-dependent neoplasms
- Impaired hepatic functions
- Dyslipidemia, diabetes, hypertension, migraine.....
- Lactating mothers – use progestin - only pills (mini pills)

**N.B. Obese Females, Smokers,  
Females > 35 years**



**better given progestin only pills**

# Combined Oral Contraceptives (COC): (Interactions)

## A. Medications that cause contraceptive failure: ( i.e. impairing absorption & CYT P450 Inducers)

- Antibiotics that interfere with normal GI flora → ↓absorption and ↓ enterohepatic recycling → ↓ its bioavailability.
- Microsomal Enzyme Inducers → ↑ catabolism of OC. (Phenytoin , Phenobarbitone, Rifampin)

## B. Medications that ↑ COC toxicity: (i.e. CYT P450 inhibitors)

- Microsomal Enzyme Inhibitors; ↓ metabolism of OC → ↑ toxicity. (Acetaminophen, Erythromycin, SSRIs.)

## C. Medications of altered clearance (↓) by COC: ↑ toxicity

- WARFARIN, Cyclosporine, Theophylline.



# Types ORAL CONTRACEPTIVE (OC) Pills

## According to composition & intent of use

COMBINED Pills (COC)

MINI Pills (POP)

MORNING-AFTER Pills

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

- Contains only a progestin → as norethindrone or desogestrel....
- Mechanism of Action:
- *The main effect is* → increase cervical mucus, so no sperm penetration & therefore, no fertilization.

# Mini Pills

- **Indications:**

- Are alternative when oestrogen is contraindicated (e.g.: during breast feeding, hypertension, cancer, smokers over the age of 35).
- **Contraceptives containing only a progestin**
- Should be taken **every day**, the **same time**, **all year** round
- I.M injection e.g. medroxy progesterone acetate 150 mg every 3 months..

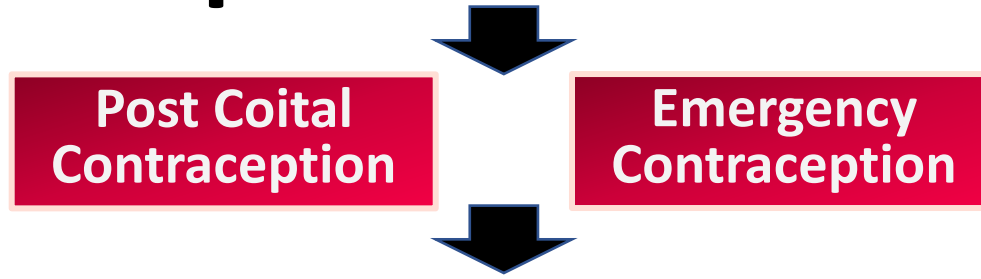
# Morning-after pills

- **Indications:**

- **When desirability for avoiding pregnancy is obvious:**

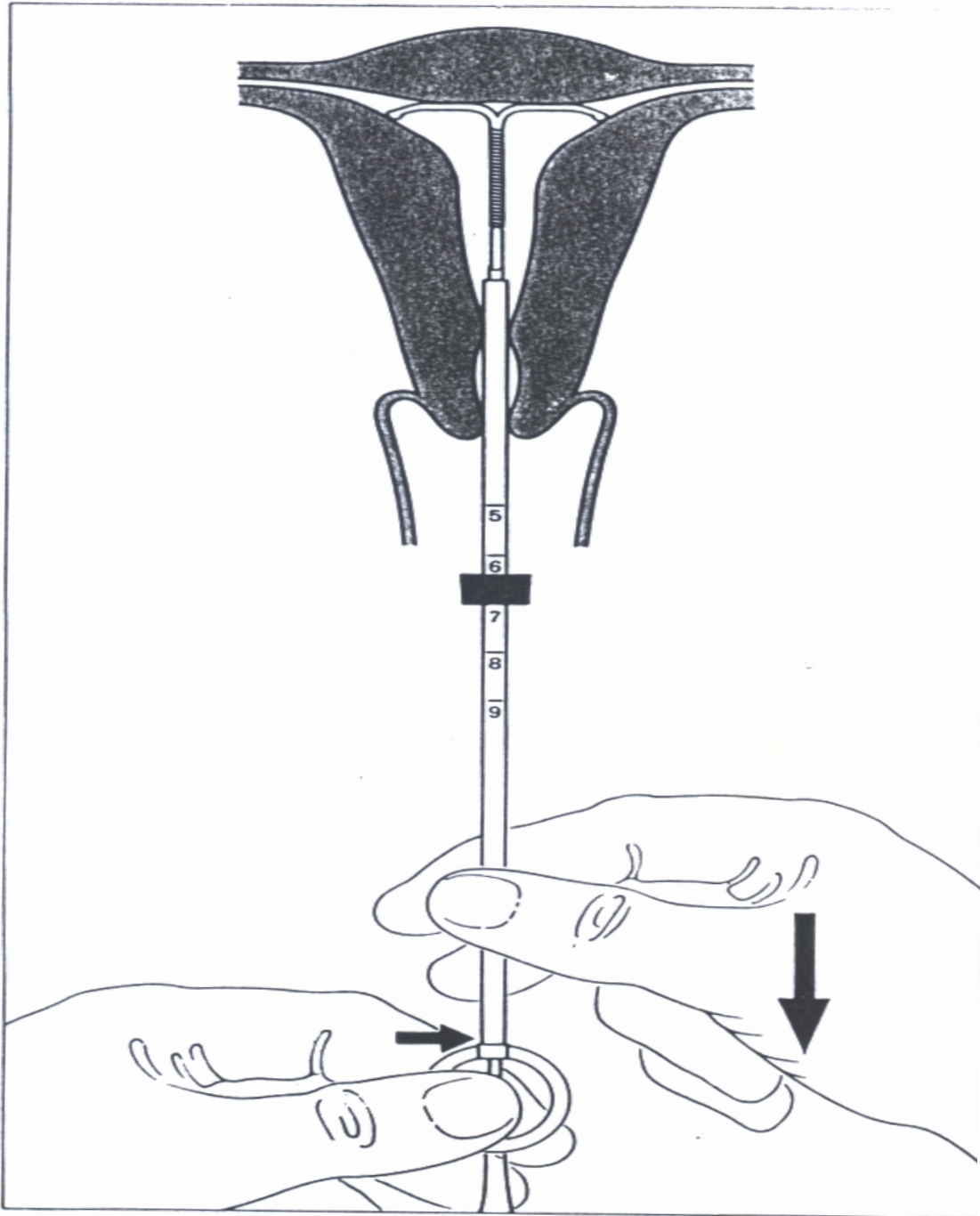
- Unsuccessful withdrawal before ejaculation
- Torn, leaking condom
- Missed pills
- Exposure to teratogen e.g. Live vaccine
- Rape

# Morning-after pills



Composition	Method of Administration	Timing of 1st dose After Intercourse	Reported Efficacy
Ethinyl estadiol + Levonorgestrel	2 tablets twice with 12 hrs in between	0- 72hrs	75%
High-dose only Ethinyl estadiol	Twice daily for 5 days	0- 72hrs	75 - 85%
High dose only levonorgestrel	Twice daily for 5 days	0- 72hrs	70 – 75%
Mifepristone (Antiprogestin) ± Misoprostol (Pg)	A single dose	0- 120 hrs	85 - 100%

# Intrauterine Device (IUD)





**Contraceptive  
Diaphragm**



**Vaginal ring**

**Questions ???**