





MOTTO AND VISION



- To impart evidence based research oriented medical education
- To provide best possible patient care
- To inculcate the values of mutual respect and ethical practice of medicine



HORMONAL CONTRACEPTION

SOURCE :

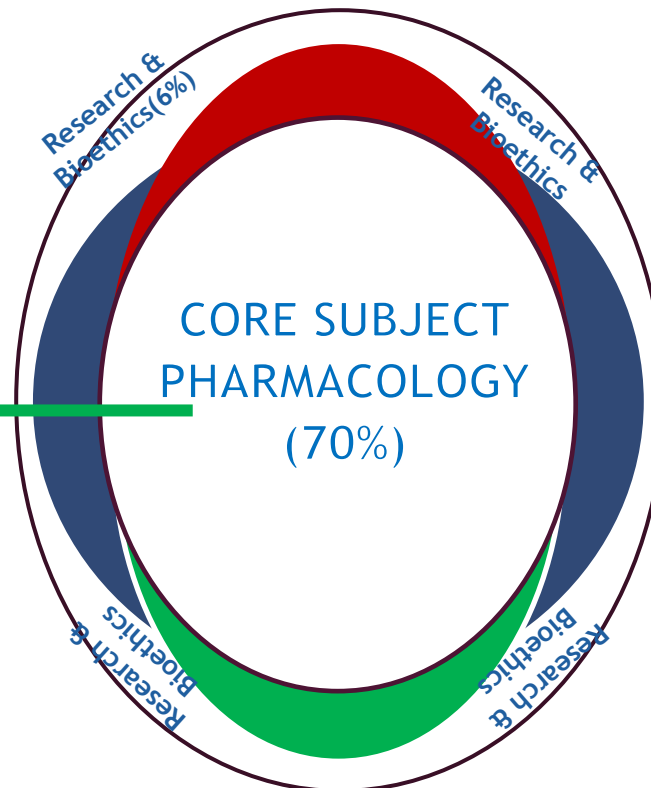
BERTRAM G.KATZUNG BASIC & CLINICAL PHARMACOLOGY 15TH EDITION
GOOGLE FOR IMAGES & RESEARCH ARTICLE

PROFESSOR UMAR'S CLINICALLY ORIENTED INTEGRATION MODEL FOR BASIC SCIENCES INTERACTIVE LECTURES



VERTICAL INTEGRATION
Clinical Subjects (18%)

SPIRAL INTEGRATION
ANATOMY /
PHYSIOLOGY (6%)



2nd Year Pharmacology LGIS(33 slides)

Core Subject - 17slides (62%)

**Horizontal Integration (anatomy/physiology)-(2 slide)
(7%)**

**Vertical integration (Clinical Subjects) • (Medicine) - 2
slides (7%)**

Research & Bioethics 4 slide(14%)





LEARNING OBJECTIVES



- 🕒 Discuss different hormonal contraceptive methods
- 🕒 Mechanism of action of hormonal contraception
- 🕒 Adverse effects and contra indications of hormonal contraception
- 🕒 Clinical uses of hormonal contraceptives



ASSESSMENT



Q1: Which hormone is responsible for the negative feedback on the hypothalamus and anterior pituitary, leading to inhibition of follicular development during COC use?

- ☐ A) Estrogen
- ☐ B) Progesterone
- ☐ C) Both estrogen and progesterone
- ☐ D) Follicle-stimulating hormone (FSH)

Q2: Which COC side effect is associated with estrogen content?

- ☐ A) Weight gain
- ☐ B) Nausea
- ☐ C) Mood changes
- ☐ D) Breakthrough bleeding



ASSESSMENT



Q 3: Which COC side effect is more common with progestin-only pills (mini-pills) compared to combined pills?

- ☐ A) Breakthrough bleeding
- ☐ B) Weight gain
- ☐ C) Headache
- ☐ D) Hypertension

Q 4: Which COC is contraindicated in smokers over the age of 35 years due to an increased risk of thromboembolic events?

- ☐ A) Combined oral contraceptives (COCs)
- ☐ B) Progestin-only pills
- ☐ C) Emergency contraceptive pills
- ☐ D) Intrauterine devices (IUDs)

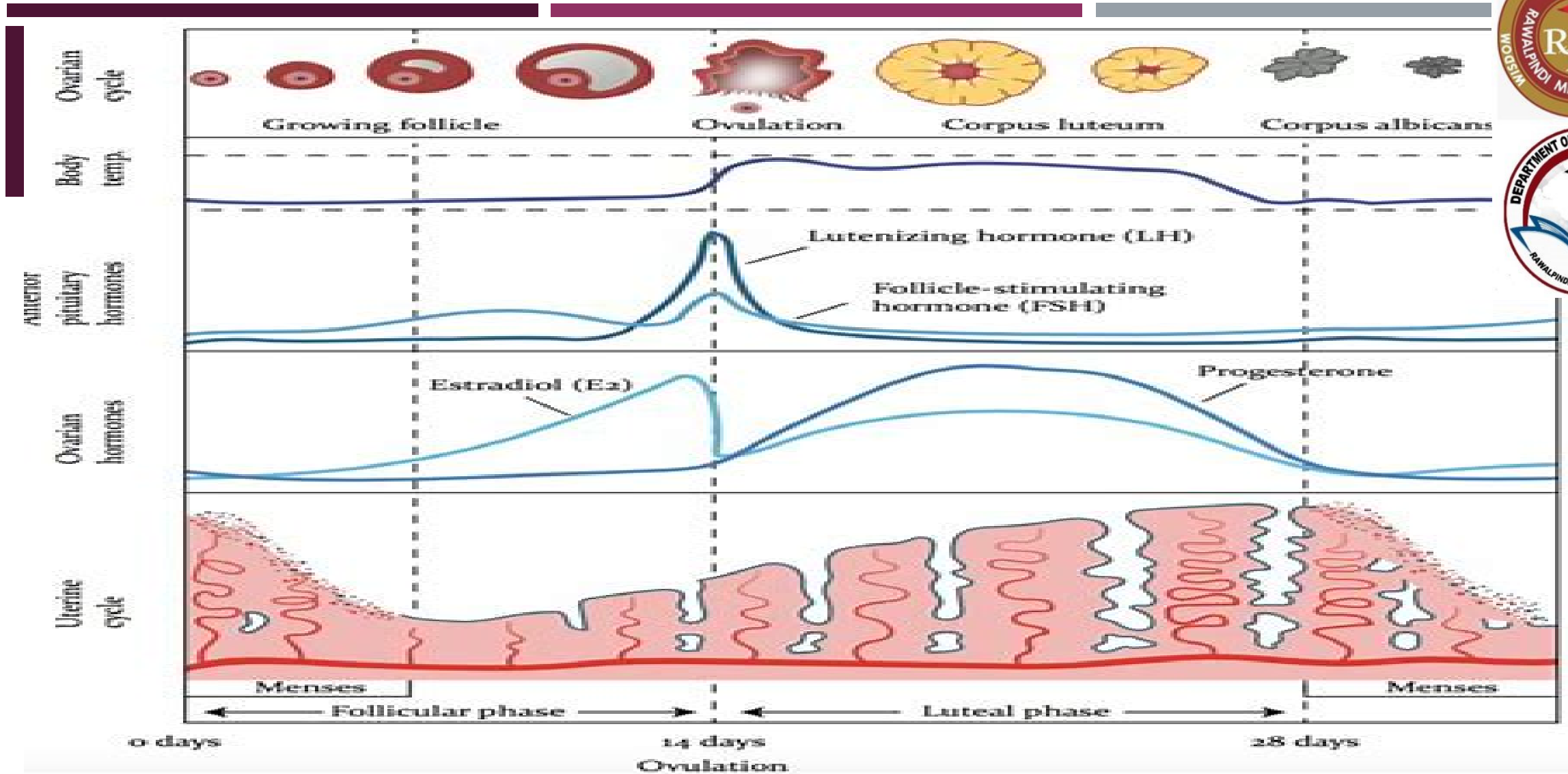


ASSESSMENT

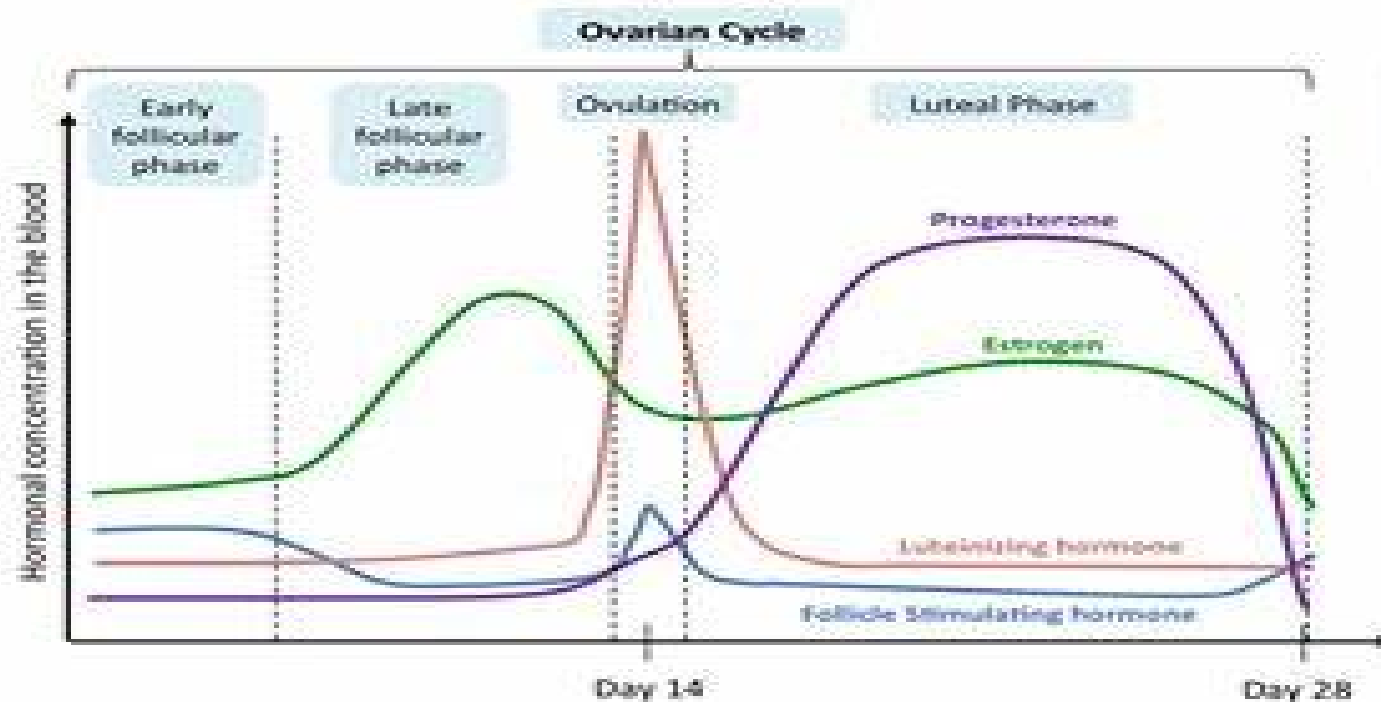


Q 5: Which progestin-only contraceptive method is administered as a subdermal implant and provides long-term contraception?

- 🏠 A) Implanon
- 🏠 B) Medroxyprogesterone acetate (Depo-Provera)
- 🏠 C) Levonorgestrel intrauterine device (IUD)
- 🏠 D) Norethindrone mini-pill



Menstrual Cycle Physiology: Ovarian Cycle - Luteal Phase Explained



Note:

- The LH surge can be thought of as only providing enough "battery power" for the corpus luteum to run and make progesterone for 14 days, which is why the luteal phase is a fixed length.
- The timing and function of estrogen and progesterone during the ovarian cycle are also important to the uterine cycle (see Uterine Cycle slide)

Besides ovulation, the Day 14 surge in LH also stimulates a process called "luteinization": the maturation of the ruptured follicle's granulosa cells into the corpus luteum

Corpus luteum begins to secrete a large amount of progesterone and a smaller amount of estrogen.

The combination of high progesterone and estrogen negatively feed back on hypothalamus and anterior pituitary

↓ Production of GnRH, FSH, and LH

↓ FSH means no new follicles grow in the ovary in this phase

↓ LH means less stimulation for continued corpus luteum growth

If implantation does occur, HCG (human chorionic gonadotropin) maintains the corpus luteum so progesterone (and therefore endometrium) will be maintained

If no implantation of embryo, corpus luteum degenerates after 14 days, allowing GnRH/FSH/LH to restart the Ovarian Cycle



CLASSIFICATION



ORAL
CONTRACEPTIVES

INJECTABLE
CONTRACEPTIVES

TRANSDERMAL
PATCHES

SUBCUTANEOUS
IMPLANTS

INTRAUTERINE
DEVICES AND
VAGINAL RINGS

MECHANISM OF ACTION OF HORMONAL CONTRACEPTIVES

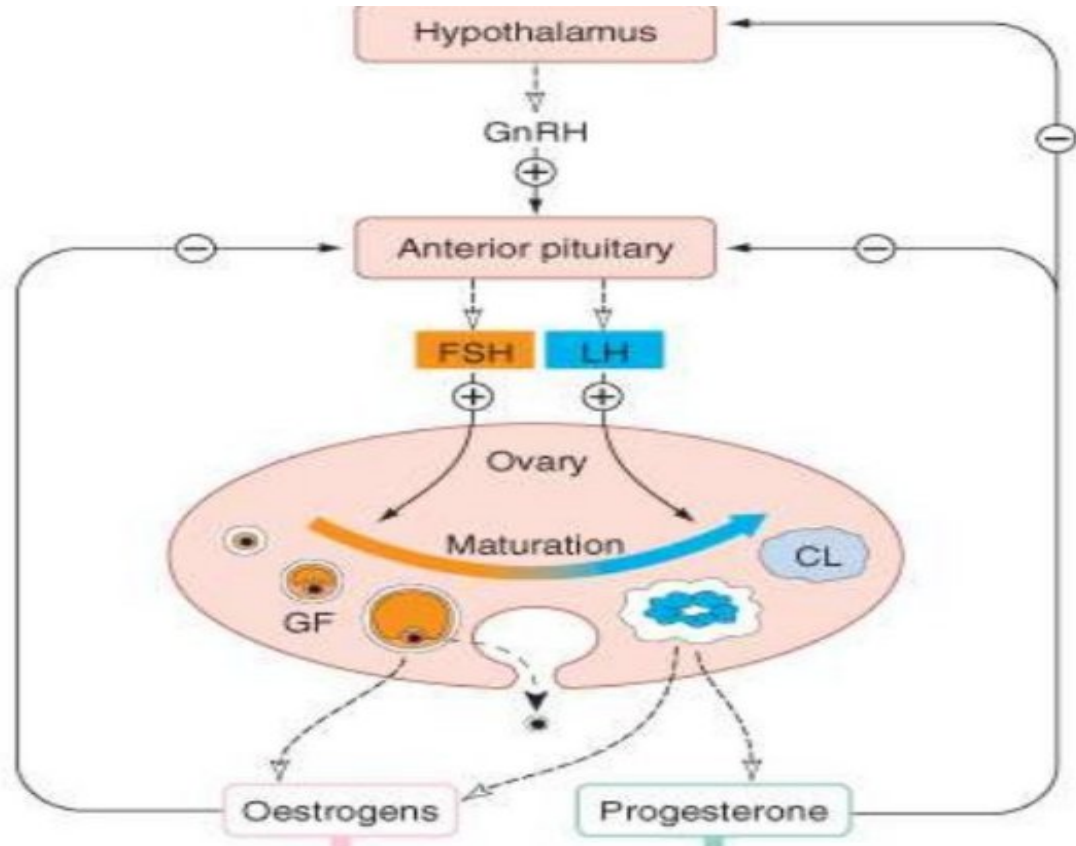
Estrogen and progesterone inhibit FSH, LH, LH surge and GnRH preventing ovulation



Progesterone makes cervical mucus thick



Progesterone makes endometrial lining unfavorable for implantation





TYPES OF HORMONAL CONTRACEPTIVES

COMBINED HORMONAL CONTRACEPTIVES

- Oral
- Transdermal patches
- Vaginal rings

PROGESTERONE ONLY CONTRACEPTIVES

- Oral
- Injectable
- Subdermal implants
- Intrauterine devices



COMBINED ORAL CONTRACEPTIVES



- Contain both estrogen and progesterones
- Estrogen: Ethinyl estradiol, Mestranol
- Progesterone: Levonorgestrel, Norgestrel, Norethindrone and Desogestrel

Monophasic



Day 1-21: dose one
Day 22-26: placebo week

Biphasic



Day 1-14: dose one
Day 15-21: dose two
Day 22-26: placebo week

Triphasic



Day 1-6: dose one
Day 7-11: dose two
Day 12-21: dose three
Day 22-26: placebo week

COMBINED OCPS

■ ADVANTAGES

- Safe and convenient to use
- 99% effective if used correctly
- No delay in return to fertility
- Controlled by woman herself
- Have other health benefits too

⚠️ DISADVANTAGES

- ⚠️ Require taking a pill every day
- ⚠️ Provides no protection for STIs
- ⚠️ Side effects



TRANSDERMAL PATCH

- Combined hormonal contraceptive
- Apply one patch every week
- One patch free week after every





Press the Sides Together

blaus

CORE SUBJECT

VAGINAL RINGS

Combined hormonal contraceptives

VAGINAL RINGS

Birth Control Rings

Birth control rings are small, flexible devices worn in the vagina to offer **safe and convenient protection** from unplanned pregnancy.

INSERTION

Vaginal rings are **placed in the vagina** by a woman (similar to tampons). They're used on the following a 4-week schedule:

- Wear the ring for the **first 3 weeks**
- Remove the ring for the **first 3 weeks**



HOW DO THEY WORK

Contain **estrogen and progestin**, through the vaginal tissue to:

- Stop the ovary from releasing the egg
- Prevent sperm from fertilizing the egg

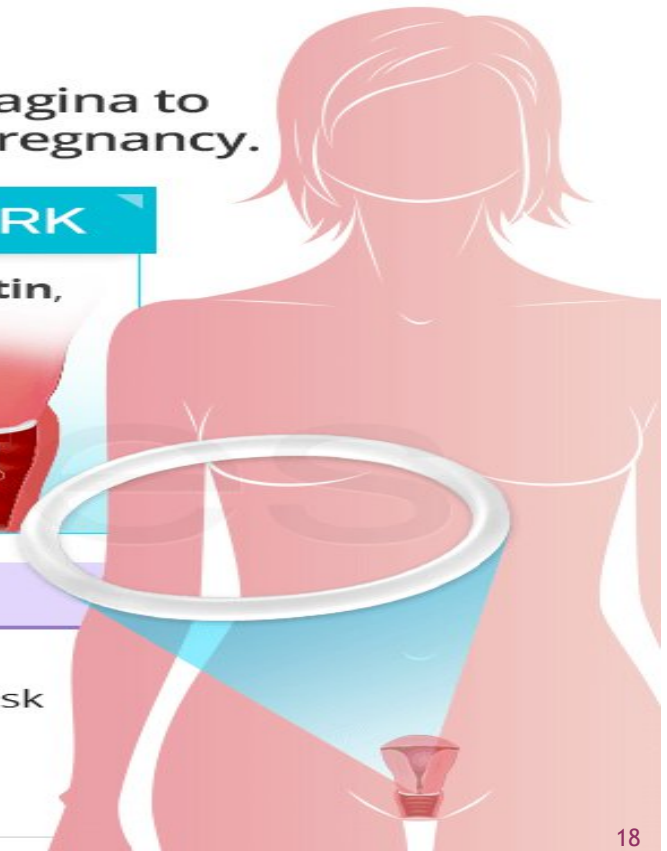


PROS

- 91- 94% effective with typical use
- Are inserted without doctor's assistance
- May regulate periods and ease PMS
- Do not hinder fertility

CONS

- Do not protect against STDs
- May increase certain health risk
- High out-of-pocket costs
- Are not recommended while breastfeeding



PROGESTERONE ONLY PILLS

- ⌚ Also called as mini pills
- ⌚ Can be used where combined OCPs are contraindicated
- ⌚ Progestogenic side effects?
- ⌚ Fertility returns around 9 months after discontinuation of method





CORE SUBJECT

SUBDERMAL IMPLANT

31-05-24

Progesterone only implant
Needs surgical insertion and removal

Birth Control Shots

While birth control shots are a **reliable and convenient** contraceptive method, women planning to get pregnant soon should be mindful of their limitations.

HOW DO THEY WORK

Contain progestin which prevents pregnancy by:

- Preventing ovulation
- Thickening cervical mucus
- Thinning uterine lining



HOW ARE THEY DONE

Ideally, shots should be injected **every 3 months** (12-13 weeks).

If done more than 15 weeks apart, a back-up birth control method is needed.



PROS

- 94% effective with typical use
- Require 4 injections per year
- May make periods lighter

CONS

- Don't protect against STDs
- High out-of-pocket cost
- May take up to 10 months to restore fertility

CORE SUBJECT

www.shecare.com



INJECTABLE CONTRACEPTIVES

Progesterone only method
DEPO-PROVERA

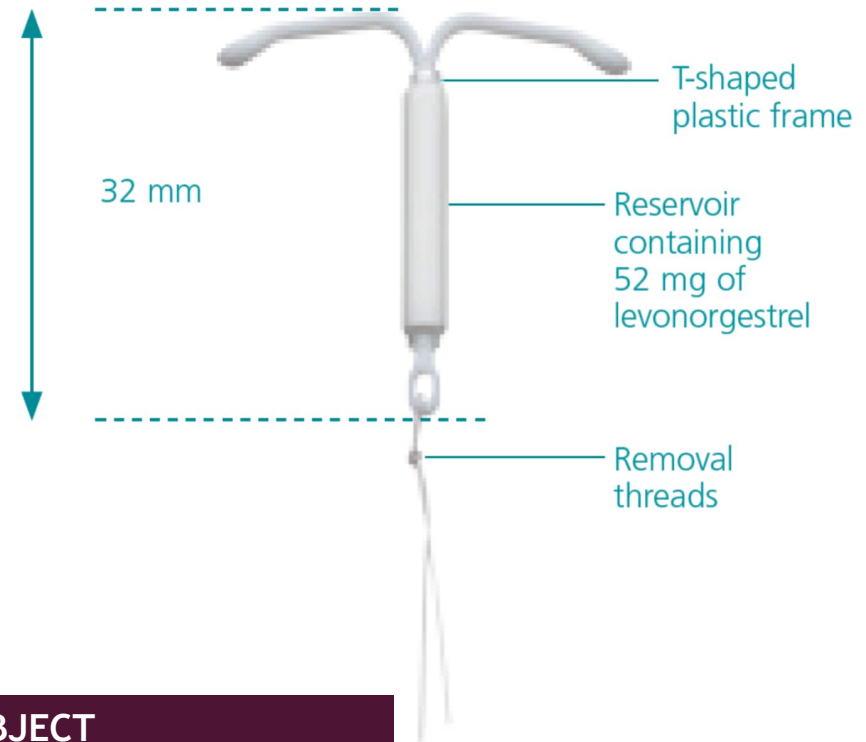
- What is LARC?
- Can you please enumerate some LARC methods?



INTRAUTERINE DEVICES

31-05-24

Mirena® in the uterus



CORE SUBJECT

Long acting method
Copper containing and hormonal is Mirena

Intrauterine Device (IUD)

IUD is a popular birth control method, offering women **effective and convenient protection** for their reproductive needs.

ABOUT

Small, T-shaped device that is inserted in the uterus to prevent pregnancy

Types:

- **Non-hormonal:**
Copper-containing IUD
- **Hormonal:**
Progestin-releasing IUD



HOW IT WORKS

Depending on the type, it can:

- Thicken cervical mucus to prevent fertilization
- Thin uterine lining to prevent implantation
- Stop ovulation



PROS

- **Effectiveness:** With proper use, IUD is more than 99% effective.
- **Convenience:** It stays in the body for 5 to 10 years.
- Upon removal, fertility is restored right away.

CONS

- No protection from STDs
- May change menstrual patterns
- Some women cannot take estrogen or are allergic to copper

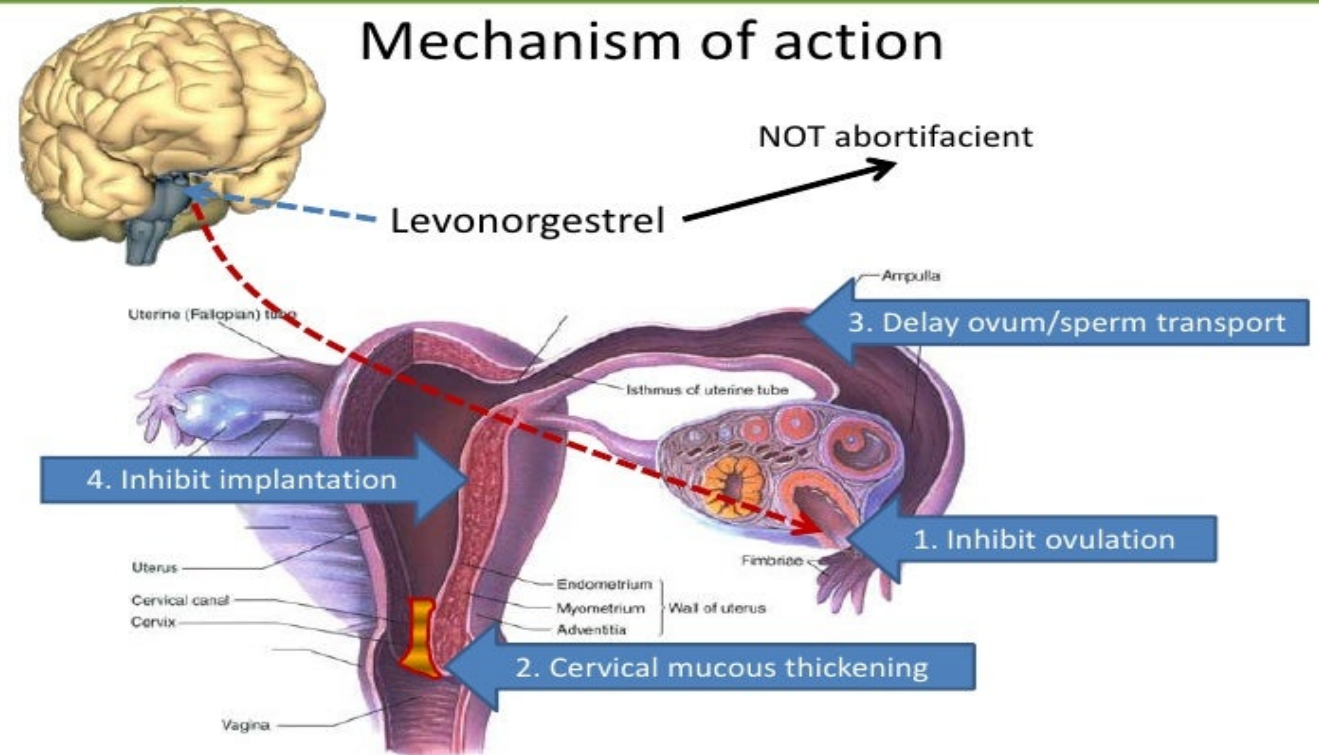


EMERGENCY CONTRACEPTION



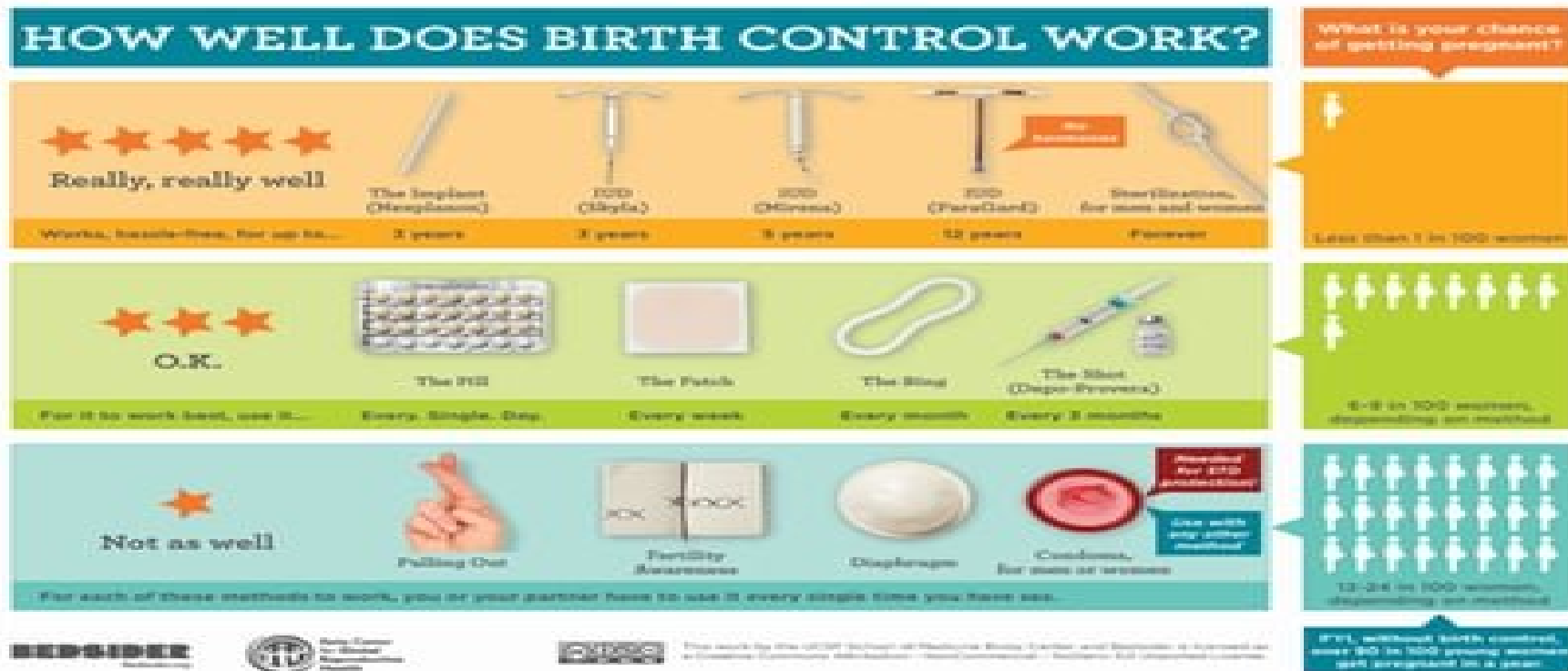
Effective if used within 72 hours of unprotected intercourse

Mechanism of action



CORE SUBJECT

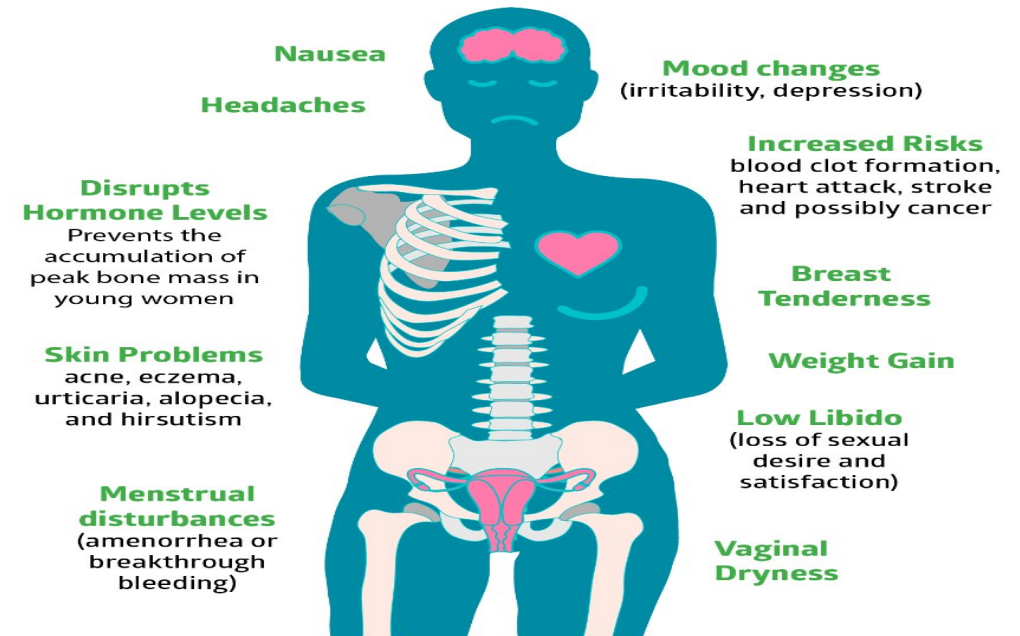
Effectiveness of Contraceptives



ADVERSE EFFECTS OF COMBINED HORMONAL CONTRACEPTIVES

- ⌚ Increase Cholesterol, TG, VLDL and BP
- ⌚ Increase Insulin resistance
- ⌚ Increased risk of **VENOUS THROMBOEMBOLISM** and hence cardiovascular and cerebrovascular accidents.

Common Side Effects of Hormonal Contraceptives





CONTRAINDICATIONS OF COMBINED HORMONAL CONTRACEPTIVES



- 🕒 Previous thromboembolic events
- 🕒 Postpartum <6 weeks
- 🕒 Smoker (>15 cigarettes/day) older than 35 years of age
- 🕒 Migraine with aura
- 🕒 Known or suspected breast cancer
- 🕒 Impaired liver functions
- 🕒 Dyslipidemias



NON CONTRACEPTIVE BENEFITS OF OCPS

- 🕒 Used in primary hypogonadism
- 🕒 Acne, hirsutism
- 🕒 Used in dysmenorrhea, endometriosis
- 🕒 Reduced risk of ovarian cysts, ovarian and endometrial cancer, benign breast disease
- 🕒 Reduced risk of PID, ectopic pregnancy, iron deficiency anemia

THE ALL-IN-ONE GUIDE TO

DRUG INTERACTIONS

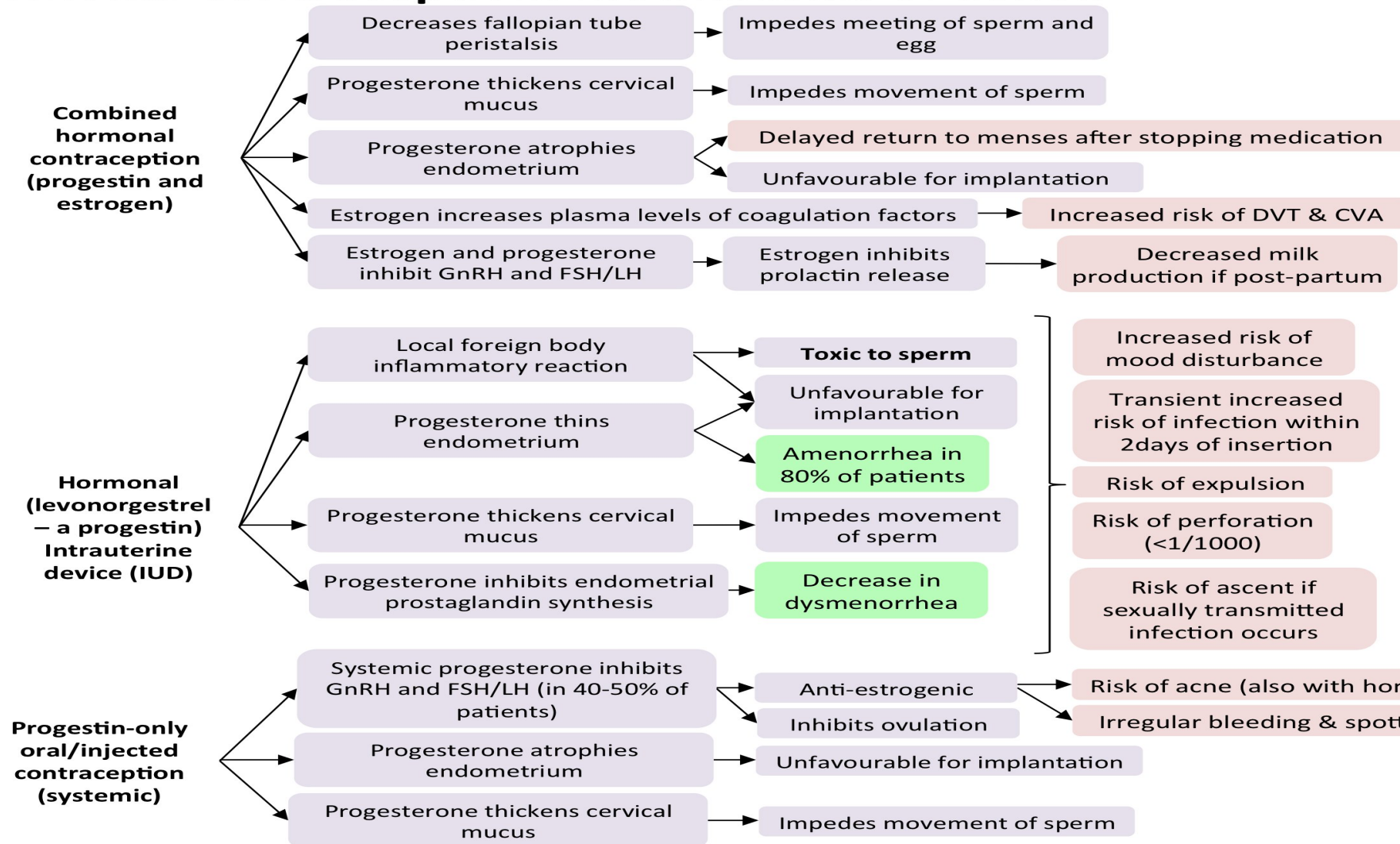


CORE SUBJECT

WHAT ARE POSSIBLE DRUG INTERACTIONS OF OCPS?

DO BROAD SPECTRUM ANTIBIOTICS AFFECT OCPS METABOLISM?

Hormonal Contraception: mechanisms of action



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* MD at time of publication

Abbreviations:

- **GnRH:** Gonadotropin Releasing Hormone
- **FSH:** Follicle Stimulating Hormone
- **LH:** Luteinizing Hormone
- **DVT:** Deep vein thrombosis
- **CVA:** Cerebrovascular accident

Note: For details of normal menstrual cycle physiology, see also *The Hypothalamic-Pituitary-Ovarian Axis* slide.

31-05-24

Legend: Pathophysiology Mechanism Sign/Symptom/Lab Finding Complications Published February 12, 2017 on www.thecalgaryguide.com



Table 1. Patient-Reported Adverse Effects of Hormonal Contraceptives

<i>Adverse effect</i>	<i>More likely</i>	<i>Less likely</i>
Acne	Progestin-only methods ^{2,3}	Combined oral contraceptives, Nuvaring (combined estradiol/etonogestrel vaginal ring) ⁴
Amenorrhea	Mirena (levonorgestrel-releasing intrauterine system), ^{5,6} Implanon (single-rod etonogestrel implantable device), ^{2,7} Depo-Provera (long-acting injectable depot medroxyprogesterone acetate), ⁸ continuous-cycle combined oral contraceptives, ^{5,9} Nuvaring (continuous use)	Combined oral contraceptives, progestin-only pills
Breakthrough bleeding	Low-dose combined oral contraceptives, ^{9,10} extended-cycle regimens ^{9,11} (especially those containing levonorgestrel ¹²), progestin-only pills, ^{9,10} Implanon ^{2,7}	Higher-dose combined oral contraceptives, ⁹ Mirena, ⁶ extended-cycle regimens with norethindrone, ¹² Ortho Evra (norgestromin/ethinyl estradiol contraceptive patch), ⁴ Nuvaring ⁴
Breast tenderness	Ortho Evra ⁴	Combined oral contraceptives with 20 mcg of ethinyl estradiol or less, ⁵ combined oral contraceptives after 18 months of use, ⁸ Nuvaring ⁴
Decreased libido	Very low-dose combined oral contraceptives (15 mcg of estrogen per day) ¹³	—
Depressed mood	Depo-Provera (possibly) ¹⁴ ; hormonal contraceptives generally have no effect ^{9,12,15}	Nuvaring (possibly) ⁴ ; hormonal contraceptives generally have no effect ^{9,12,15}
Headache (general)	All hormonal methods, especially in women older than 35 years ^{9,16}	—
Headache (menses-associated)	—	Extended-cycle combined oral contraceptives ^{17,18}
Heavy menses	Depo-Provera, ⁸ Implanon ^{2,7}	Combined hormonal contraceptives (oral, Ortho Evra, Nuvaring); low-dose combined oral contraceptives ⁹ ; Mirena ^{5,6}
Hirsutism	Progestin-only methods ^{3,8}	Combined oral contraceptives
Increased vaginal discharge	Nuvaring ⁴	All other methods
Irregular menses	Implanon, ^{2,5,7} Depo-Provera, ^{1,8} emergency contraceptive regimens	Ortho Evra
Nausea	Emergency contraceptive regimens with combined oral contraceptives, ¹⁹ Ortho Evra ⁴	Nuvaring ⁴ ; no differences among combined oral contraceptives ⁹
Oily skin	Progestin-only methods ³	Combined oral contraceptives
Weight gain	Depo-Provera ^{8,20}	Combined hormonal contraceptives (oral, Ortho Evra, Nuvaring); Mirena; progestin-only pills

31-05-24

Information from references 1 through 22.



BIOETHICS

The Four Key Principles of Bioethics



Non-Maleficence

"Do no harm." Minimize any possible risks to the patient.



Autonomy

The patient/family retains the right to make treatment decisions with all relevant information presented to them.

Beneficence

The overall needs of the individual must be taken into account with the benefits balanced against the risks.

Justice

Access to treatment and care should be fair and equitable.





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- § Go to the website of HEC National Digital Library.
- § On Home Page, click on the INSTITUTES.
- § A page will appear showing the universities from Public and Private Sector and other Institutes which have access to HEC National Digital Library HNLD.
- § Select your desired Institute.
- § A page will appear showing the resources of the institution
- § Journals and Researches will appear
- § You can find a Journal by clicking on JOURNALS AND DATABASE and enter a keyword to search for your desired journal.



FURTHER READING



- Brabaharan S, Veettil SK, Kaiser JE, Rao VR, Wattanayingcharoenchai R, Maharajan M, Insin P, Talungchit P, Anothaisintawee T, Thakkinstian A, Chaiyakunapruk N. Association of hormonal contraceptive use with adverse health outcomes: an umbrella review of meta-analyses of randomized clinical trials and cohort studies. JAMA Network Open. 2022 Jan 4;5(1):e2143730-.
- Teal S, Edelman A. Contraception selection, effectiveness, and adverse effects: a review. Jama. 2021 Dec 28;326(24):2507-18.



Thank you.