

M U N I
M E D

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Menstrual cycle and amenorrhoea

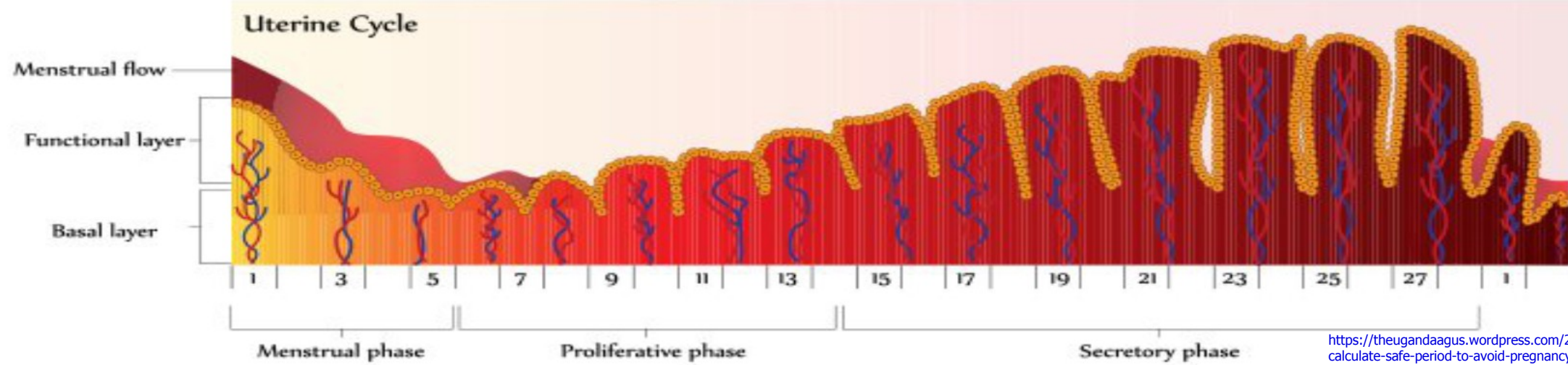
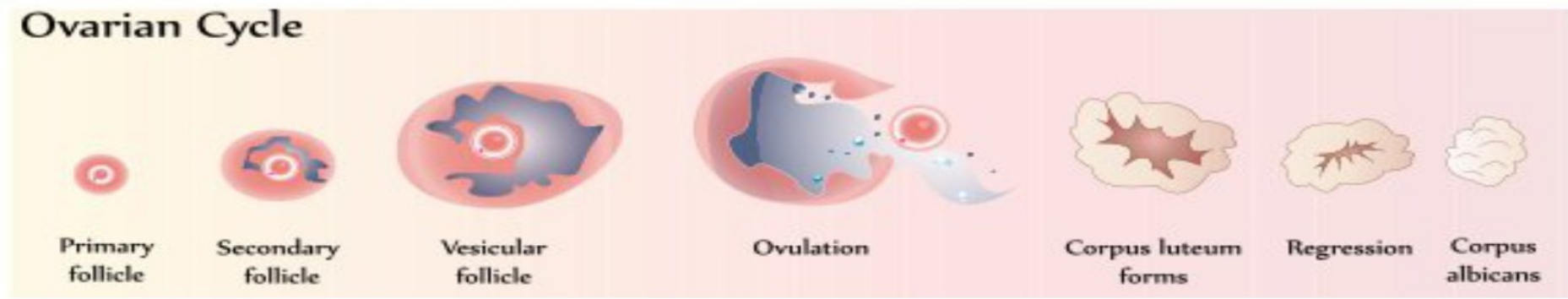
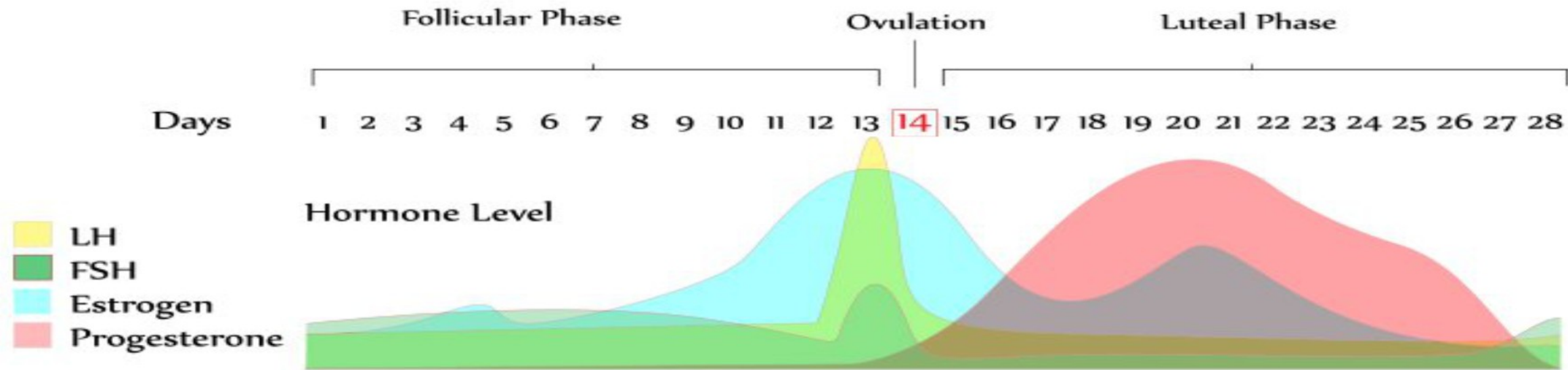
Tvarožek S., Meixnerová I.

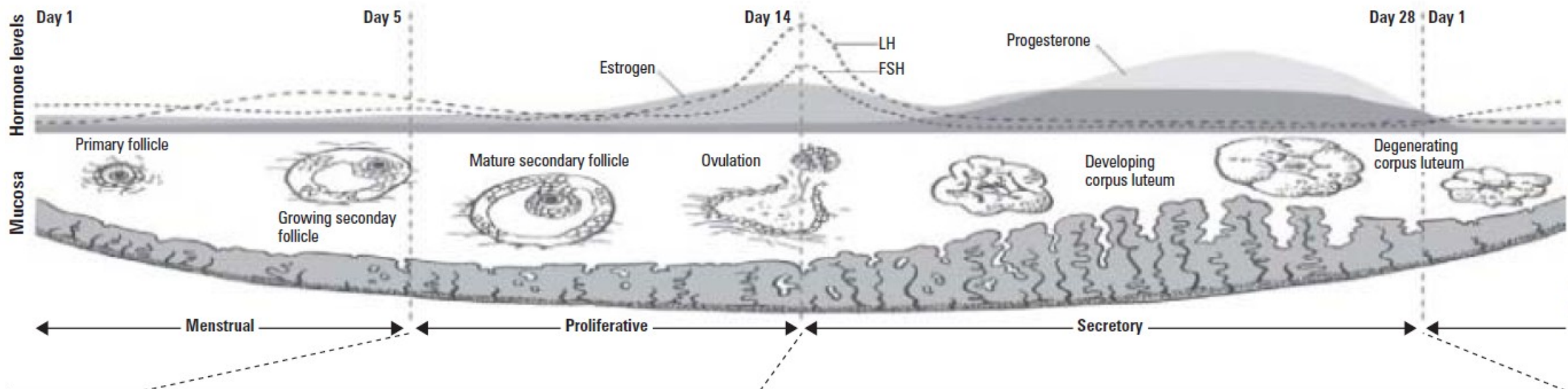
Obstetrics and Gynecology - lectures

2020

Menstrual cycle

- Endometrial changes based on hormonal changes during ovarian cycle
- **Phases of MC:**
 - Menstrual (1-5 days)
 - Proliferative (6-14 days)
 - Secretory (15-28)
- Length of MC: 25-35 days
- Length of bleeding (menstrual phase): 3-5; 7 max.
- Blood loss: 1 ml/kg





	FOLLICULAR/PROLIFERATIVE PHASE (Variable Duration)			LUTEAL/SECRETORY PHASE (Fixed Duration - 14 days)		
	Early	Mid	Late	OVULATION	Early-Mid	Late
Initiating Events	↓ E and ↓ P (from end of previous cycle)	↑ FSH acts on ovarian granulosa cells	Growing follicles continue to secrete E	Sudden switch from negative to positive feedback (E and P now ↑ FSH & LH)	Switch back to negative feedback	No fertilized oocyte
HPO Axis	↑ GnRH pulse frequency ↑ FSH ↑ LH pulse frequency	↑ E from follicles (ovary)		↑↑ LH pulse amplitude (LH surge)	↓ LH	
Hormones			↑ E from follicles, especially from dominant follicle	E peaks → LH surge → ovulation	↑ P from corpus luteum	↓ P secondary to degeneration of corpus luteum
Feedback on HPO Axis		Negative feedback E → ↓ FSH, ↓ LH		Positive feedback: E and P → ↑ FSH, ↑ LH	Negative feedback P → ↓ FSH, ↓ LH	
Ovaries	↑ FSH → follicular growth in 3-30 follicles	↑ follicular growth (by reducing atresia) → ↑ E	Dominant follicle persists, remainder undergo atresia Granulosa cells luteinize → produce P	~36 h after LH surge, dominant follicle releases oocyte; corpus luteum (remnant of dominant follicle) produces P		Cessation of P from corpus luteum
Endometrium	Menses from P withdrawal (from end of previous cycle)		E builds up endometrium		P stabilizes endometrium	Withdrawal of P → menses
Cervical Mucus		Cervical mucus: Clear, ↑ amount, Spinnbarkeit 8-10 cm, more stringy				Opaque, scant amount, Spinnbarkeit 1-2 cm

E = estrogen; FSH = follicle-stimulating hormone; GnRH = gonadotropin-releasing hormone; HPO = hypothalamic-pituitary-ovarian; LH = luteinizing hormone; P = progesterone
Figure 5. Events of the normal menstrual cycle

Disorders of menstrual cycle

- **Frequency disorders**
- **Intensity disorders**
- **Irregular uterine bleeding**

Frequency disorders

- **Polymenorrhoea** – MC shorter than 22 days
- **Oligomenorrhoea** – MC longer than 35 days
- **Amenorrhoea** – no bleeding
 - **primary**
 - **secondary**

Primary amenorrhoea

- **failure of initiation of menses by age 15**
- Hypothyroidism
- Hyperprolactinemia
- PCOS
- **Anatomic abnormalities (cryptomenorrhoea) – vaginal septum, imperforate hymen, Rokitanski syndrom)**
- **Turner syndrome 45X0, Swyer syndrome XY dysgenesis**
- **Other (pituitary tumour, IBD, chronic infections)**

Secondary amenorrhoea

- **cessation of regular menses for three months**
- **PCOS**
- **Hyperandrogenism** – ovarian tumour, adrenal androgen secreting tumour
- **Premature ovarian failure**
- **Autoimmune** – thyroid disease, DM 1
- **Addison's disease**
- **Hyperprolactinaemia**

Secondary amenorrhoea

- **cessation of regular menses for three months**
- **Hyper/hypothyroidism**
- **Pituitary adenoma, Sheehan's syndrome**
- **Asherman syndrome**
- **Oclusion of cervical canal (iatrogenic) – cryptomenorrhea**
- **Anorexia**
- **Always exclude pregnancy at first!**

Intensity disorders

- **Hypermenorrhoea (Menorrhagia)**
 - heavy menstrual bleeding
 - soaking a pad/tampon at least every 2 hours, or bleeding lasting for >7 days
- **Hypomenorrhoea**
 - short and extremely light menstrual blood flow

Hypermenorrhoea causes

- Uterine fibroids (myomas)
- Endometrial polyp
- Ovarian dysfunction
- Adenomyosis
- IUD
- Endometrial cancer
- Medication (Warfarin, LMWH, Xa inhibitors)

Oligomenorrhoea causes

- COC
- Eating disorders (anorexia, bulimia)
- Perimenopausal women
- Adolescent girls
- Antipsychotics, Antiepileptics

Irregular uterine bleeding

- **Metrorrhagia** (NOT Menorrhagia)
- **dysfunctional intermenstrual uterine bleeding**
- **Causes:** Cervical/Uterine cancer, Endometriosis, polyps, uterine fibroids, juvenile metrorrhagia, PCOS...

Diagnosis

- **Menstrual calendar**
- **Gynaecologic examination** (polyps, fibroids)
- **Ultrasound** (endometrium thickness, fibroids...)
- **Hormonal examination**
 - FSH, LH, Prolactine, E2, Progesterone
 - Testosterone, SHBG, TSH, T₄
- **Functional cytology**

Diagnosis

- **Functional tests** (Estrogen, Progesterone,...)
- **Hysteroscopy** (polyps, adenomyosis, fibroids)
- **Endometrial biopsy**
- **Laparoscopy** (endometriosis, fibroids...)
- **CT, MRI** (fibroid, tumors, endometriosis)
- **Genetics, Endocrinology, Hematology**

Therapy

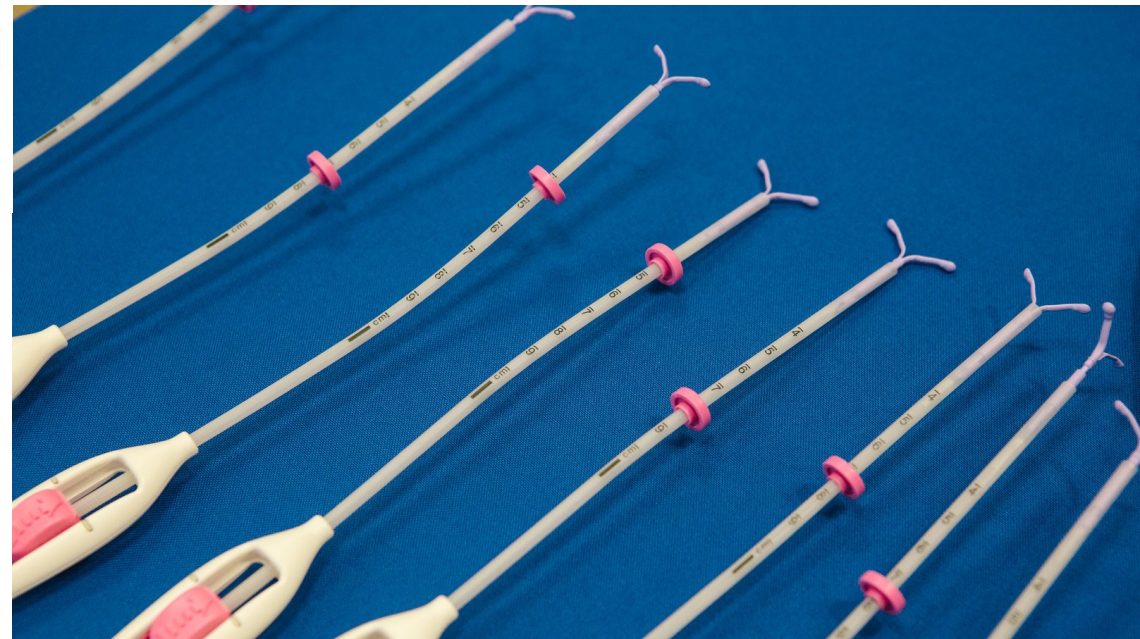
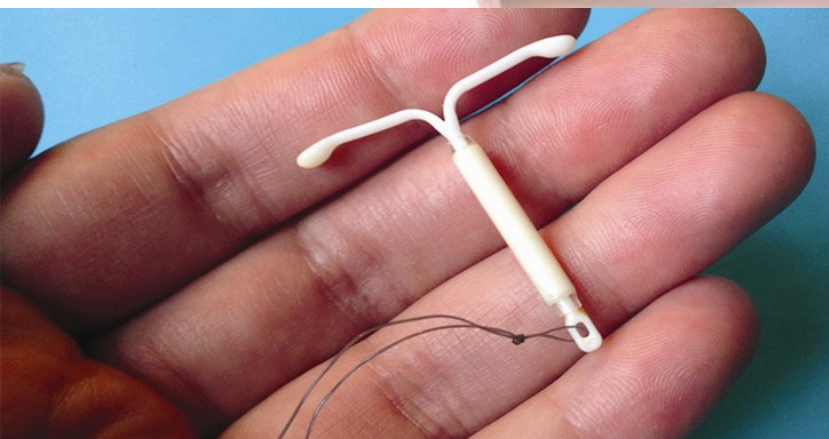
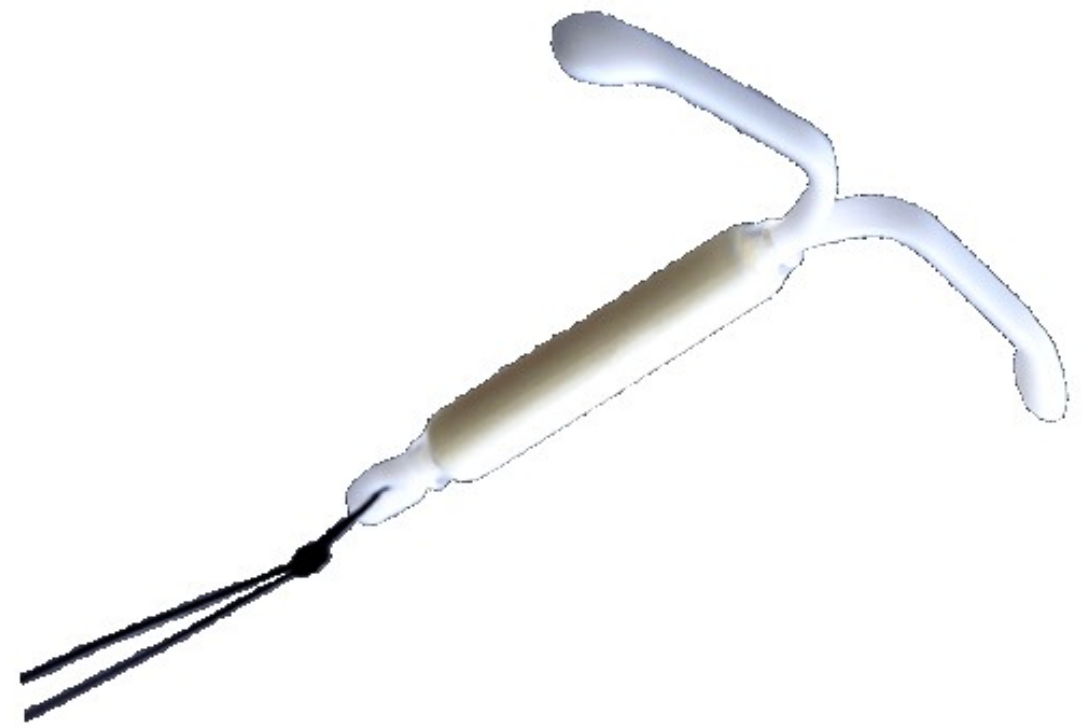
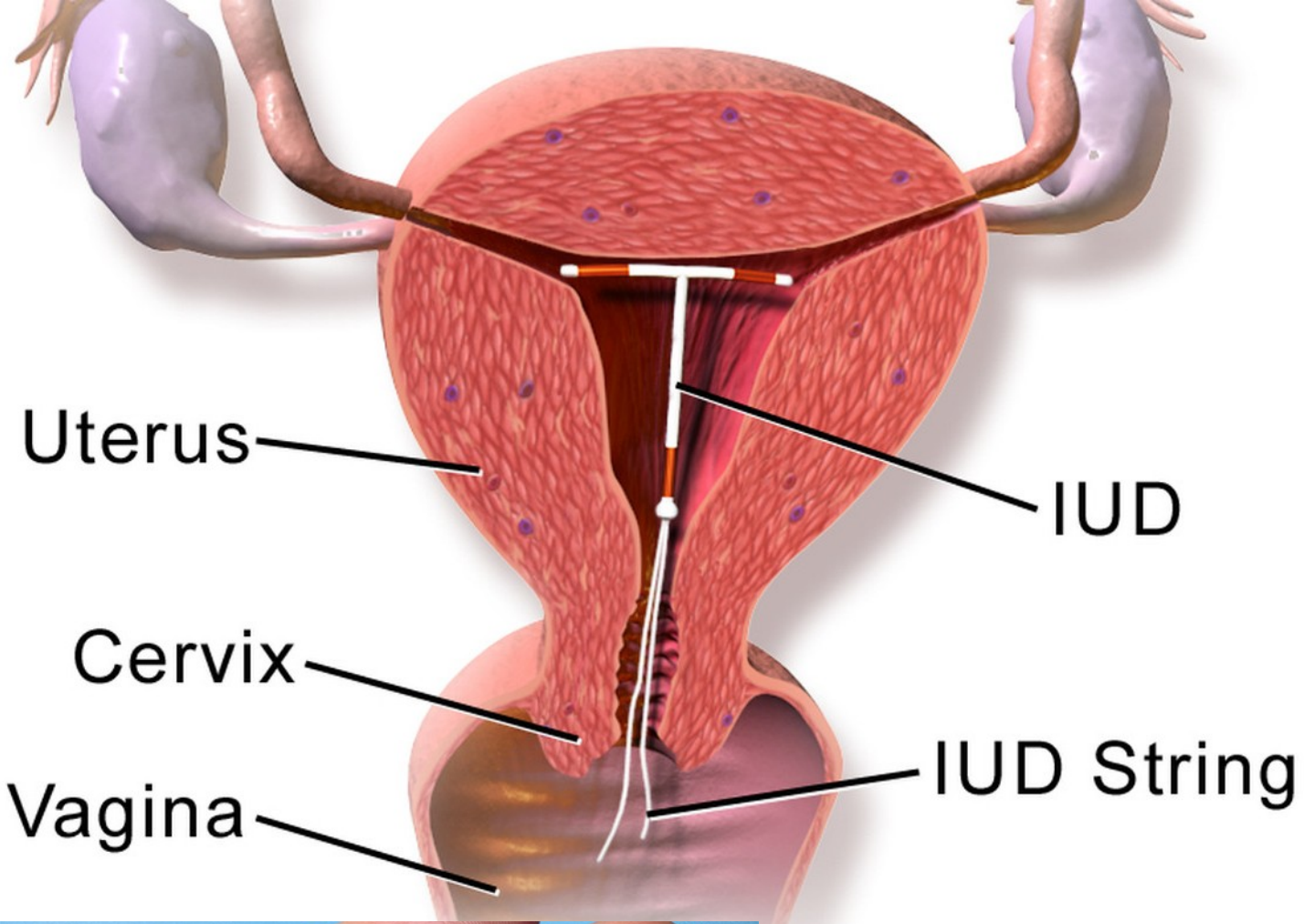
- **Based on cause**
- **Hormonal:** Estrogens, Gestagens, IUS
- **Surgical:** uterine abrasion (curettage), RFA, thermal ablation, hysterectomy

Hormonal therapy

- **Estrogens:** in case of insufficient estrogen production in first 14 days of menstrual cycle (proliferative phase)
 - in most cases as a component of COC
- **Gestagens:** in secretory phase
- **Combined oral contraception:** anovulatory cycles
 - **cyclical usage:** 21 days active pills, 7 days placebo (withdrawal bleeding)
 - **continuous usage:** without bleeding
 - **sequential usage:** E only pills during first part of MC, E+G pills thereafter

IUS

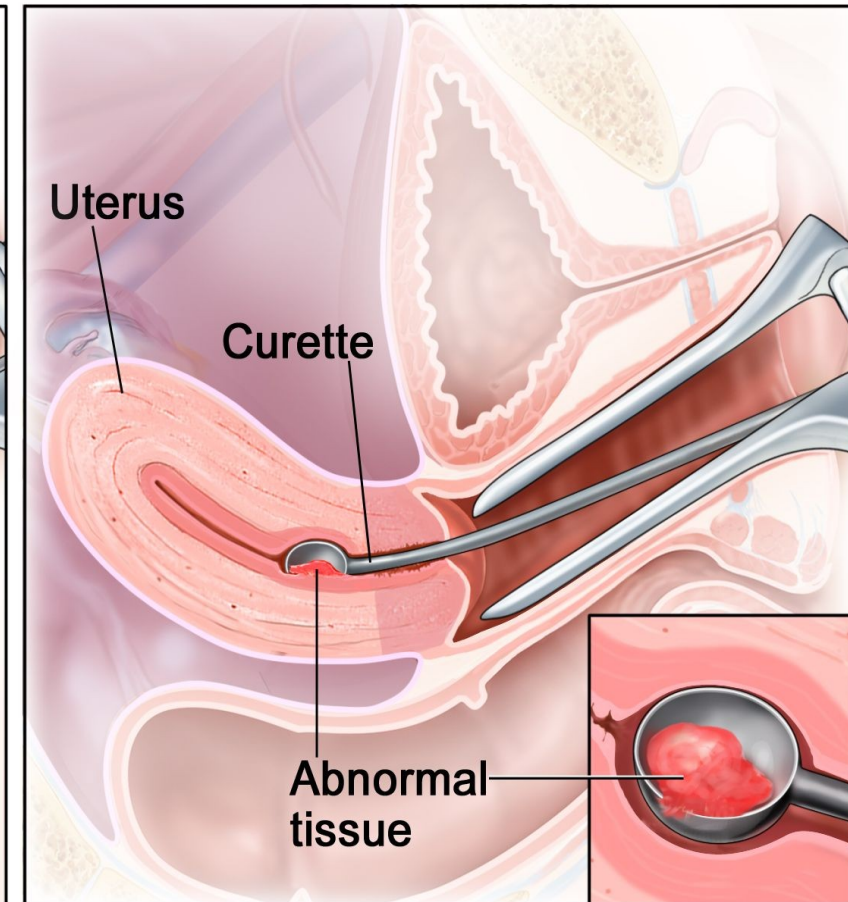
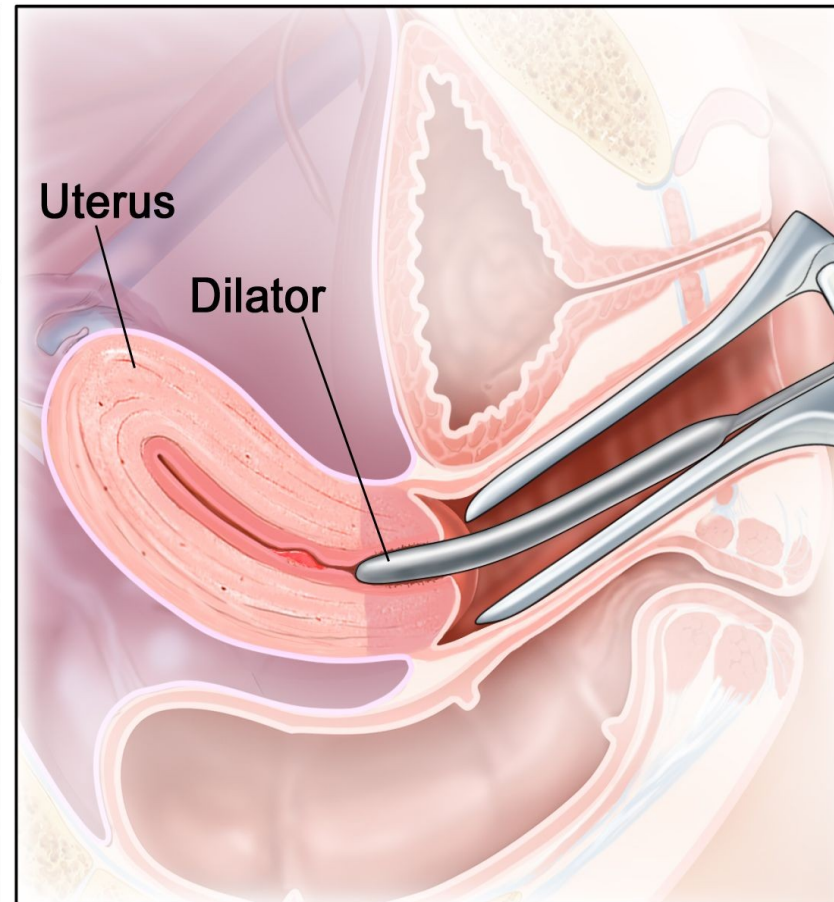
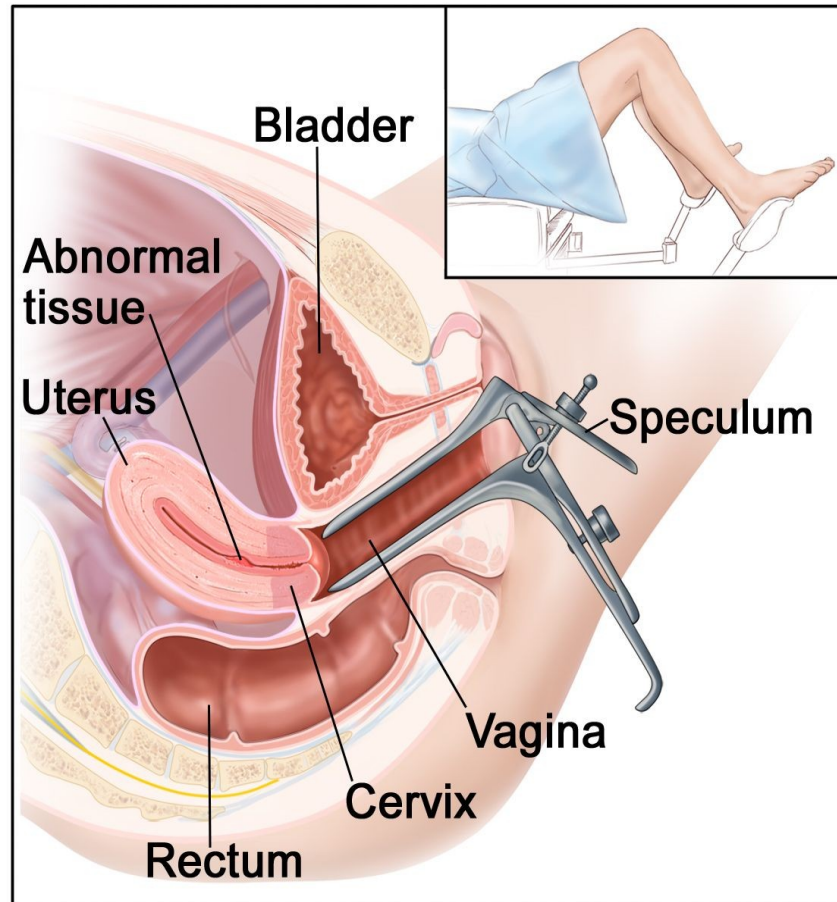
- **Intrauterine device:**
 - **T-shaped piece of plastic with copper inserten inside the womb**
 - **copper** works as a spermicide: increasing the levels of copper ions, prostaglandins, and white blood cells within the uterine and tubal fluids
- **Intrauterine system (IUS)**
 - **the plastic T-shaped device containing progestin hormone** (Levonorgestrel), which is released slowly from the IUS system to the blood
 - **Levonorgestrel causing thickening of the cervical mucus**
 - **hormone is releasing continuously from 3 to 5 years**

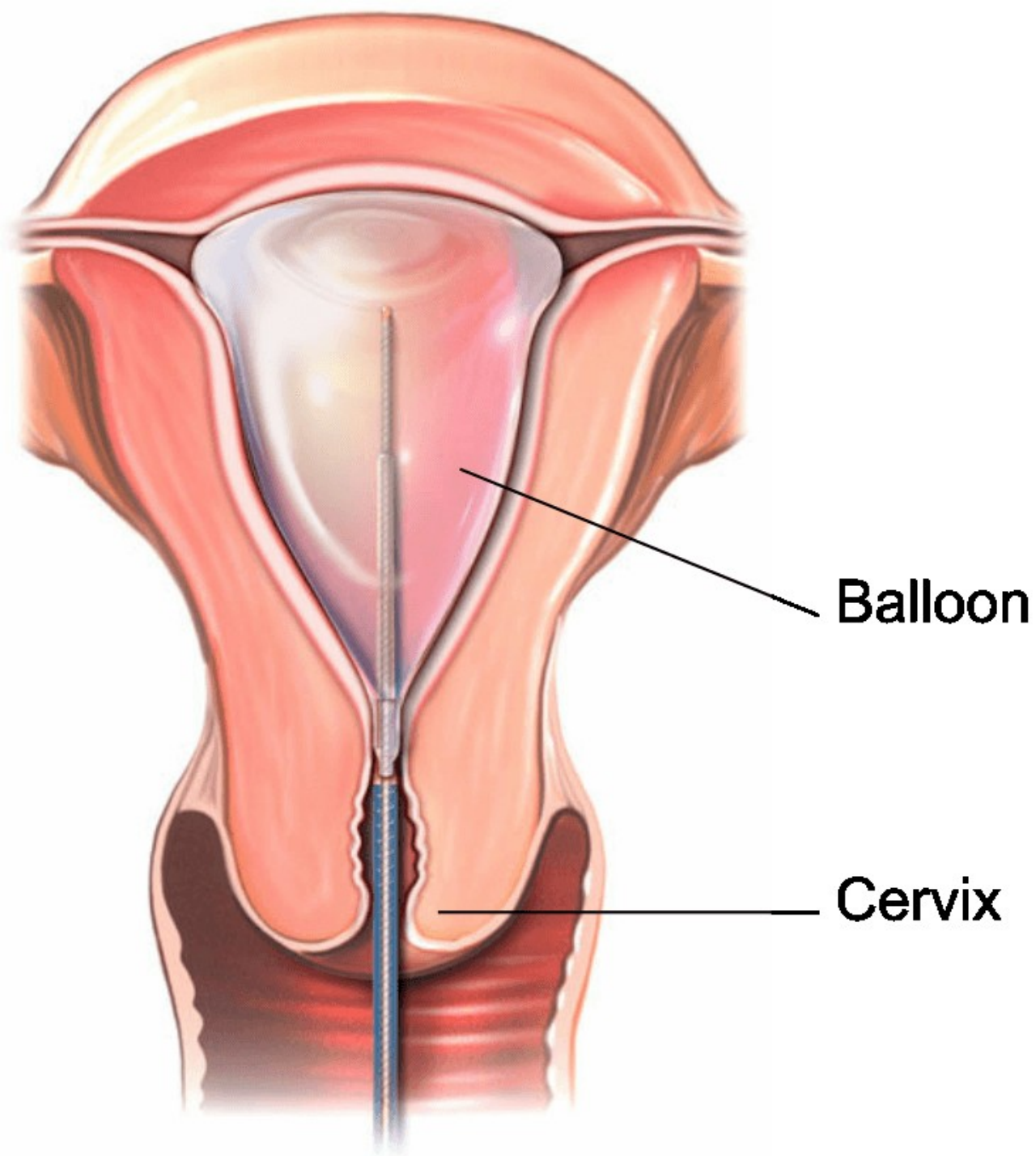


Surgical therapy

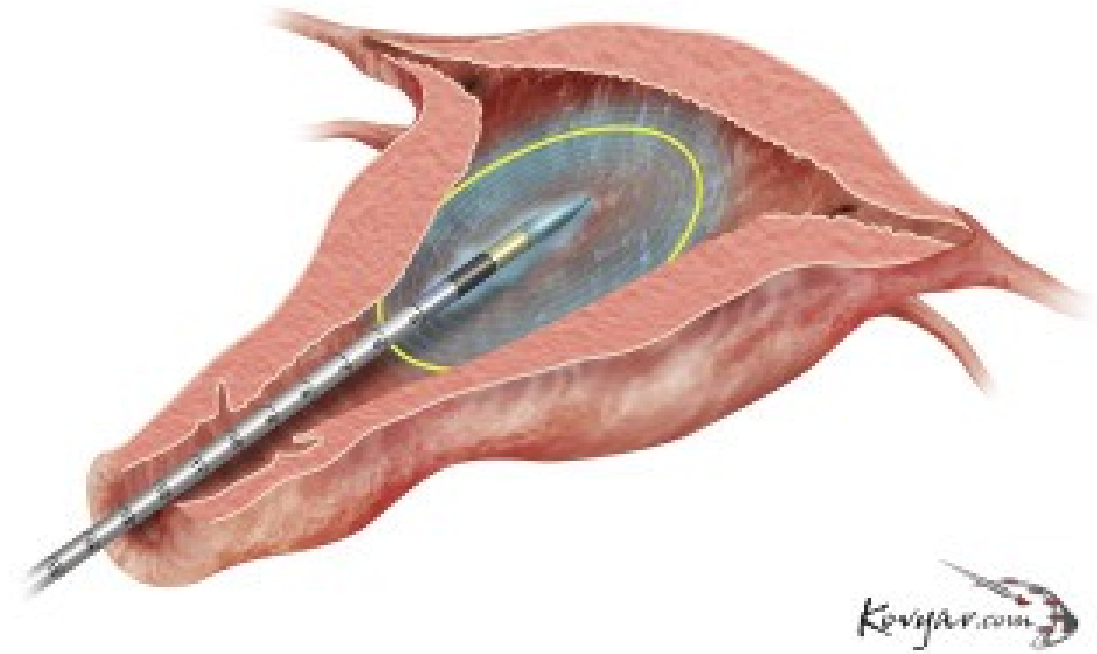
- **Uterine abrasion (curettage)**
 - procedure to remove tissue from inside your uterus
 - prior to curettage dilation (dilatation) of cervix is needed
- **RFA - Radiofrequency Endometrium Ablation**
 - using high-energy radiofrecuencie
- **Thermal (balloon) endometrial ablation**
 - special balloon filled with hot fluid to thin the endometrium
- **Hysterectomy – final solution**
 - older women, want to have (more) children, cancer

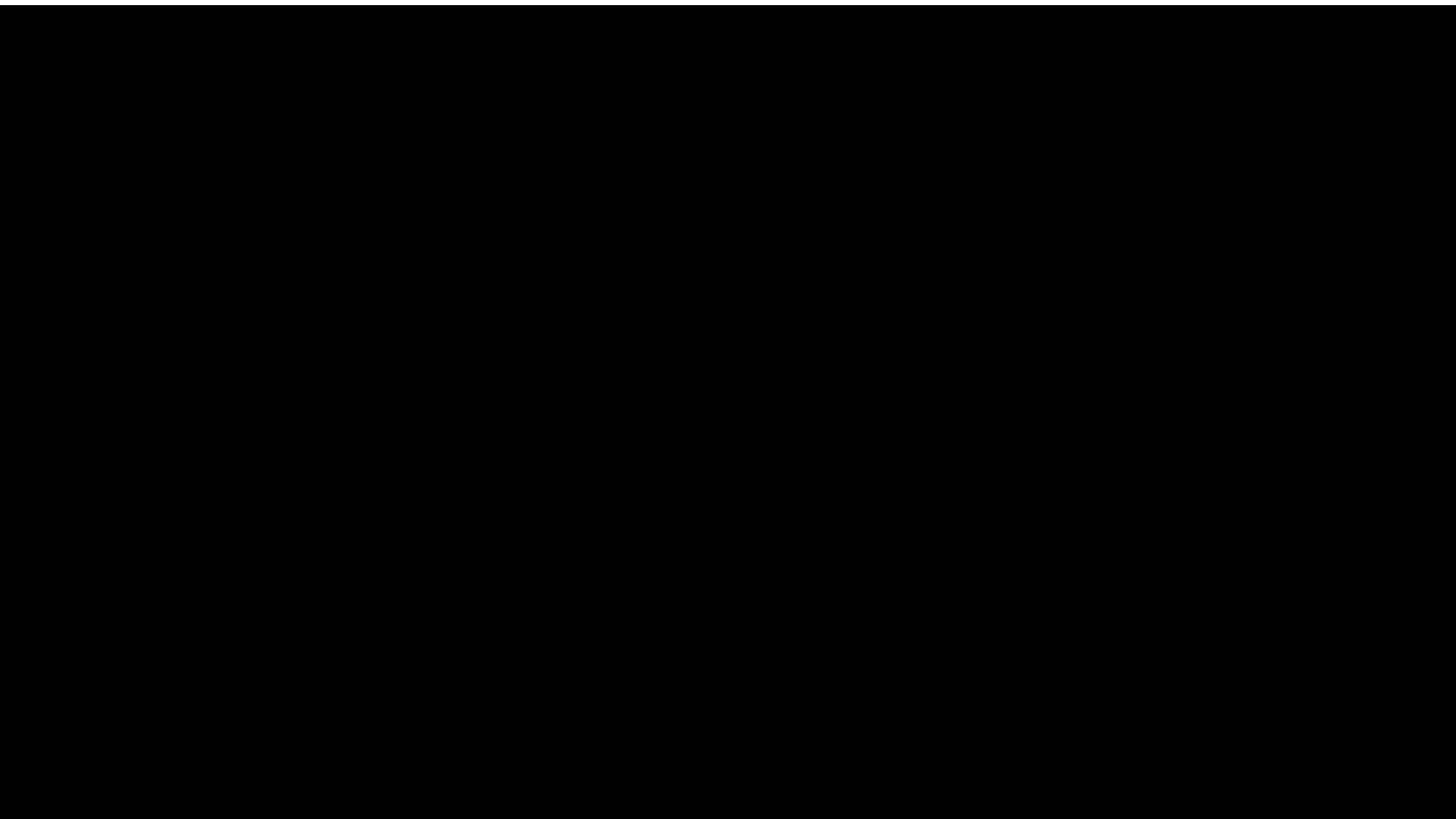
Dilatation and Curettage





Microwave Endometrial Ablation (MEA)





**Thank you
for your
attention**

**WHAT? YOU HAVE TO STUDY
FOR EXAMS?**



**HERE HAVE SOME CRAMPS, START
YOUR PERIOD AND AN OVERDOSE OF
HORMONES.**

Questions

1. Which of the following statements are true about menstruation?

- A) In a normal 28 day menstrual cycle you would expect menstruation to last approximately 10 days
- B) During menstruation the entire endometrium is shed
- C) During menstruation only the functional layer of the endometrium is shed, with the basal layer remaining intact
- D) Absence of menstruation always indicates an active pregnancy

2. At which point in the menstrual cycle is a woman most fertile?

- A) 1-5
- B) 9-16
- C) 17-21
- D) 22-28

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3. At which stage in the uterine cycle does the proliferative phase occur?

- A) 1-5
- B) 5-14
- C) 15-28
- D) proliferative phase it's not even a real term

4. Hypermenorrhoea is not caused by:

- A) Endometrial polyp
- B) Asherman's syndrome
- C) Fibroid
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5. Polymenorrhoea means menstrual cycle:

- A) longer than 35 days
- B) shorter than 22 days
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6. Amenorrhoea can't be caused by:

- A) Hyperprolactinemia
- B) Polycystic ovarian syndrome (PCOS)
- C) Ovarian tumour
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