

**M U N I
M E D**

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head: doc. MUDr. Vít Weinberger, Ph.D**

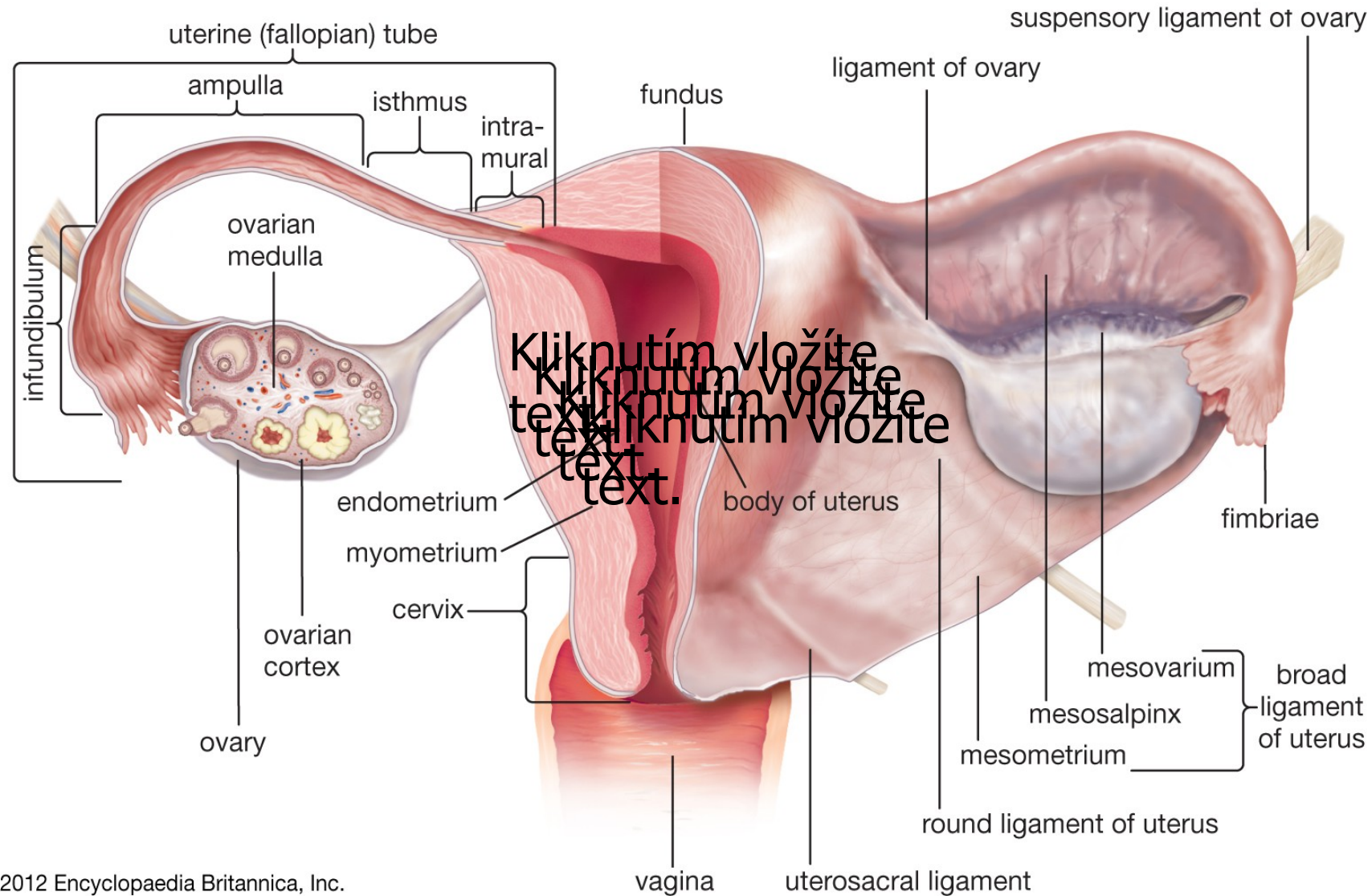
**FAKULTNÍ
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Menstrual cycle and amenorrhoea

Tvarožek S., Meixnerová I.

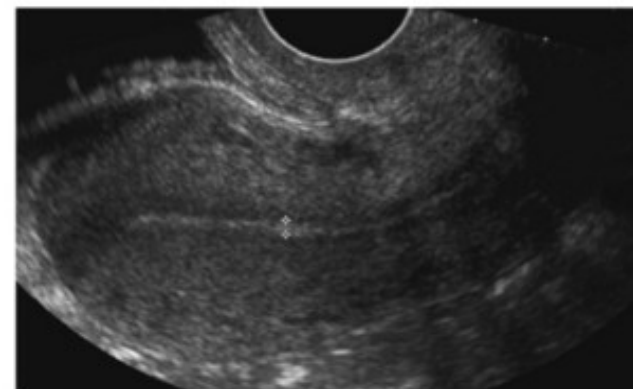
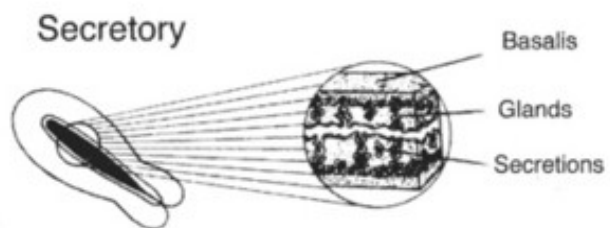
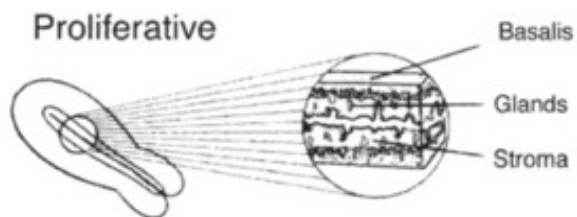
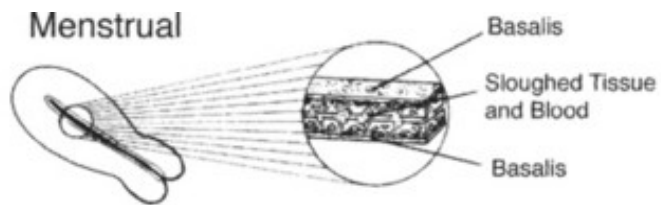
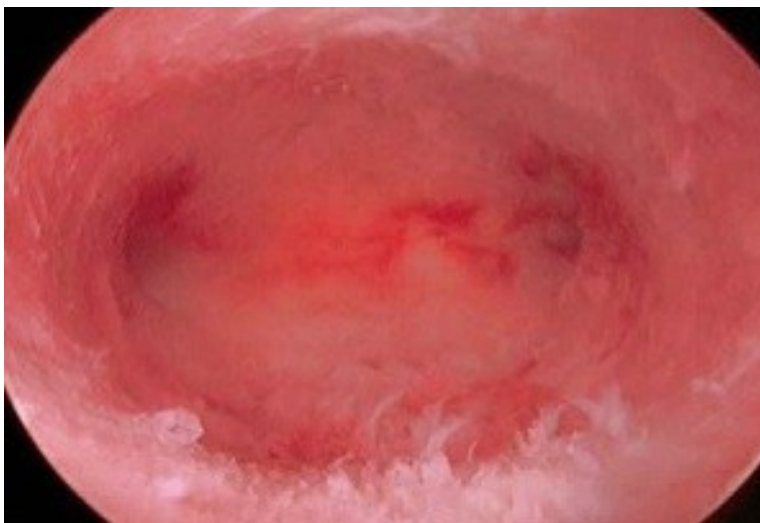
Obstetrics and Gynecology - lectures

2020



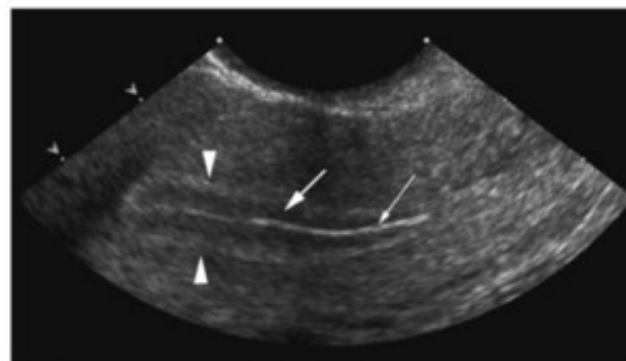
Menstrual cycle

- Endometrial changes based on hormonal changes during ovarian cycle
- Menarche 12-15
- Length of MC: 25-35 days
- Length of bleeding (menstrual phase): 3-5; 7 max. = eumenorrhoea
- Blood loss: 1 ml/kg
- Menopause 45-55

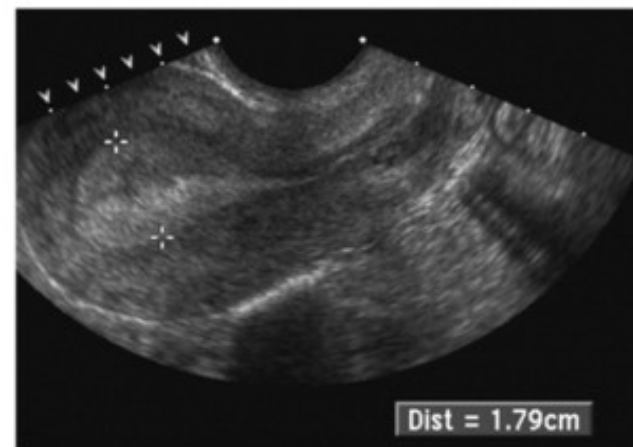


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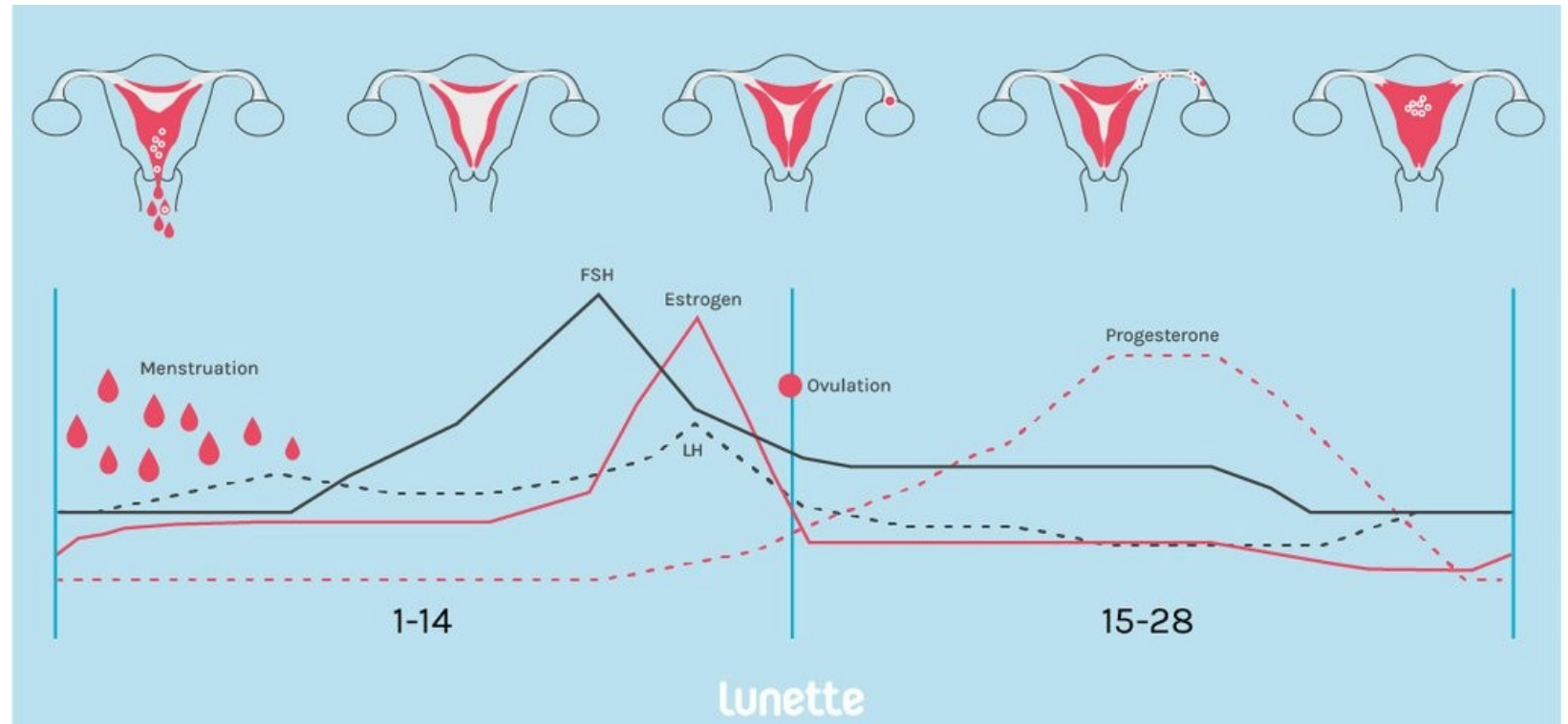


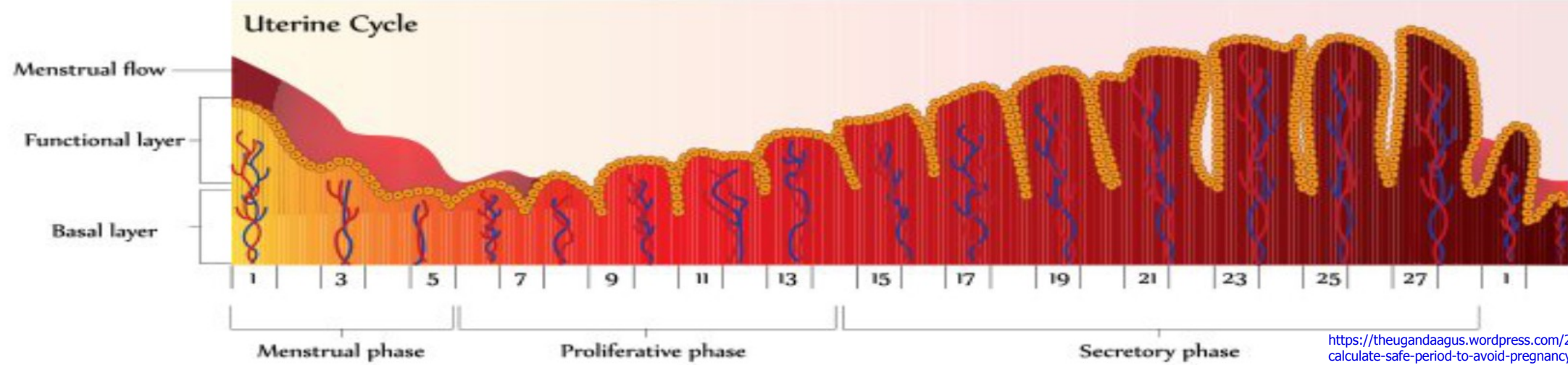
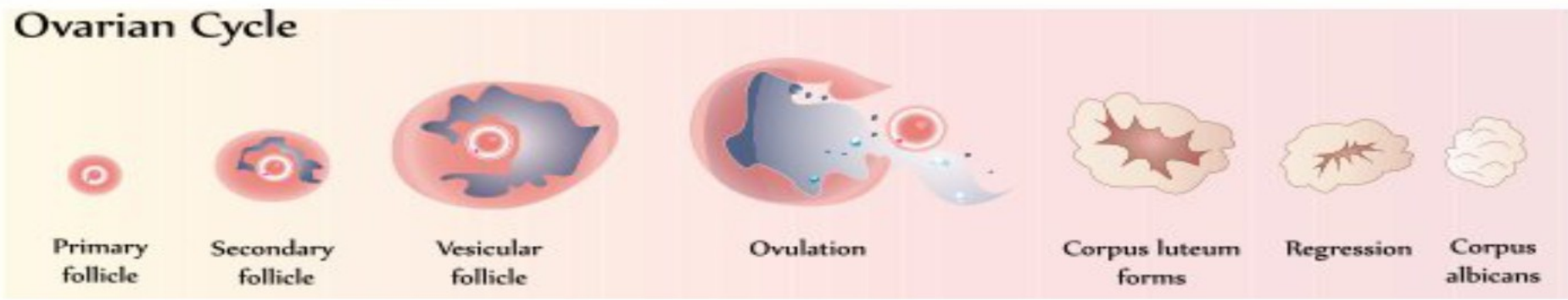
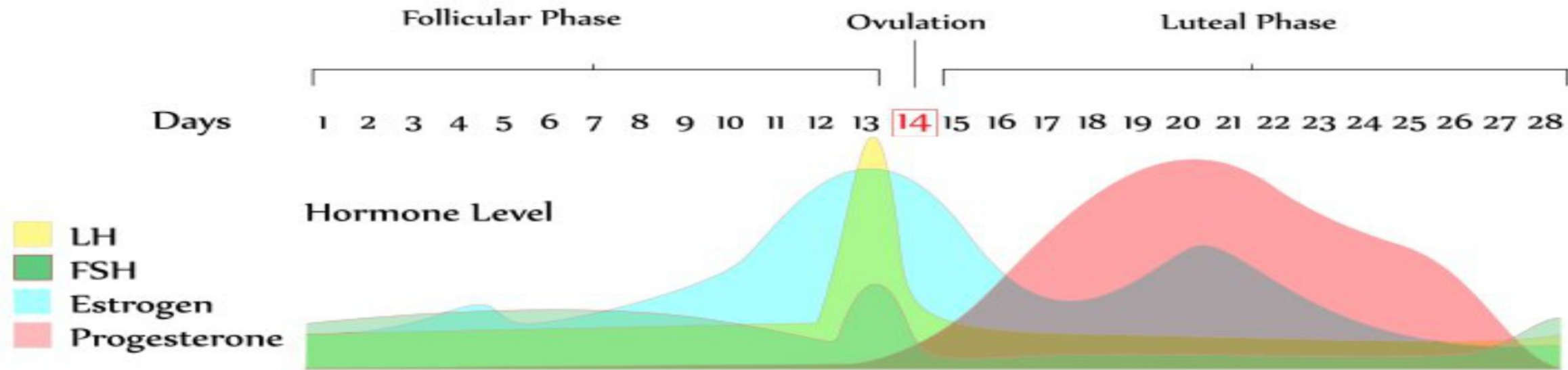
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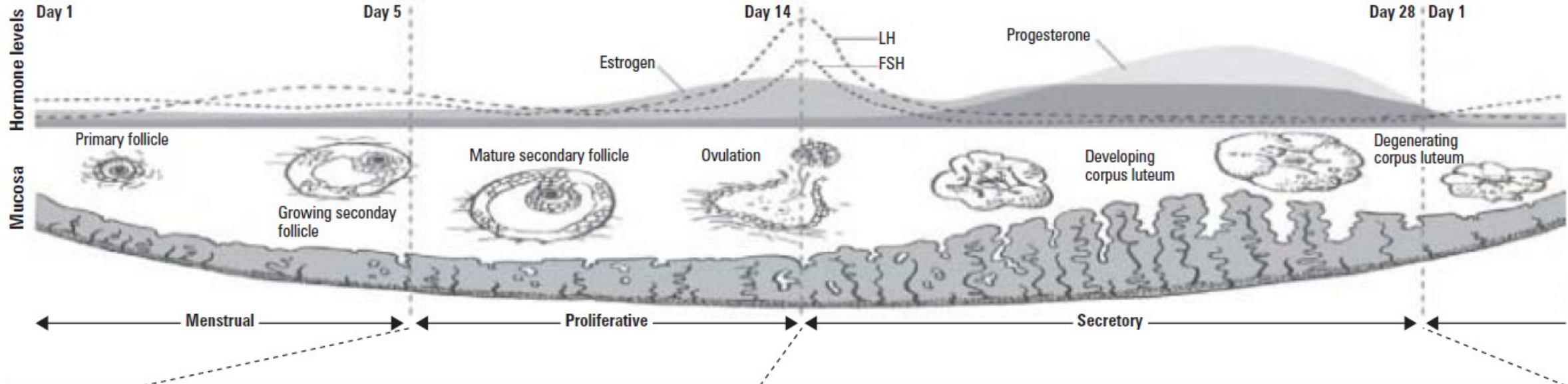


D

- **Phases of MC:**
 - **menstrual**
 - **proliferative**
 - **secretory**







	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

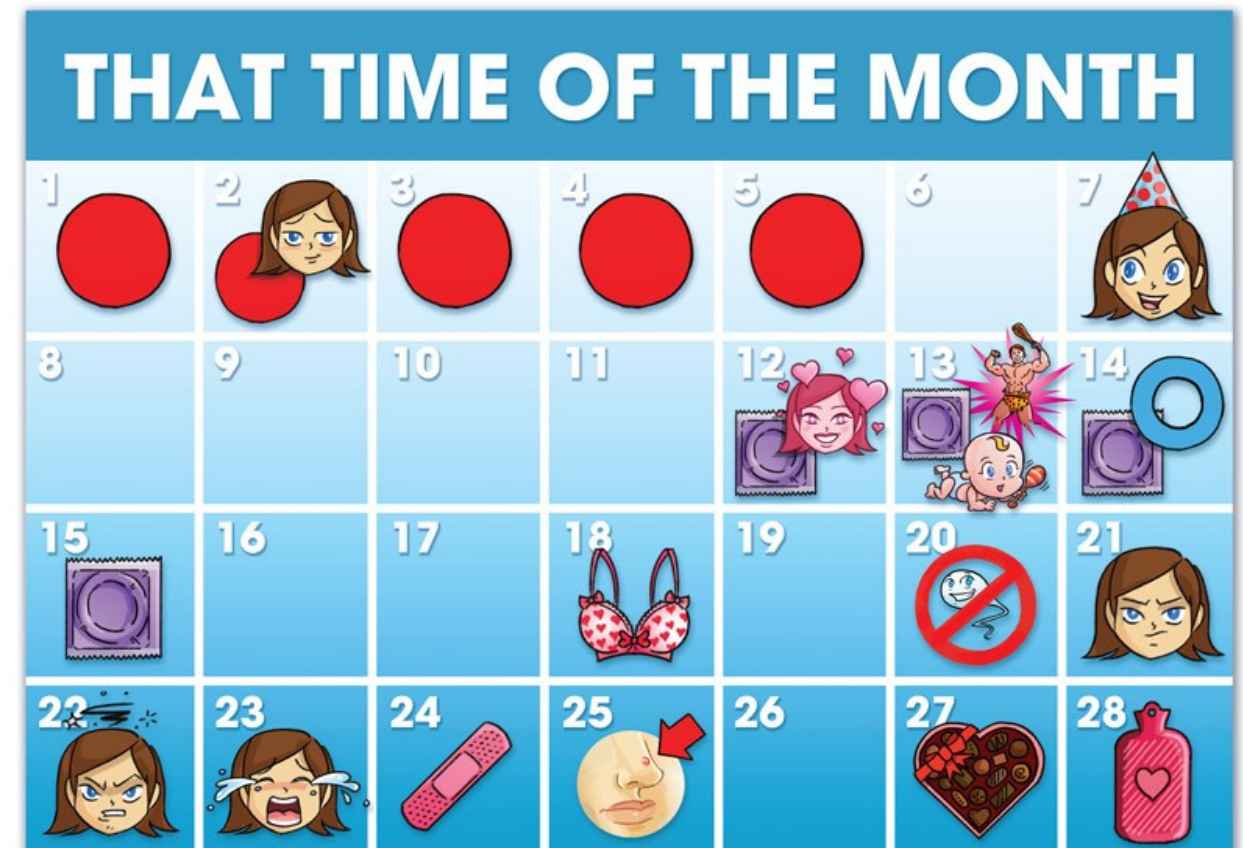
E = estrogen; FSH = follicle-stimulating hormone; GnRH = gonadotropin-releasing hormone; HPO = hypothalamic-pituitary-ovarian; LH = luteinizing hormone; P = progesterone
Figure 5. Events of the normal menstrual cycle

Disorders of menstrual cycle

- Frequency disorders
- Intensity disorders
- Irregular uterine bleeding
- Premenstrual disorders (PMS, PMDD)
- Dysmenorrhoea

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!**

Not Pregnant



Pregnant

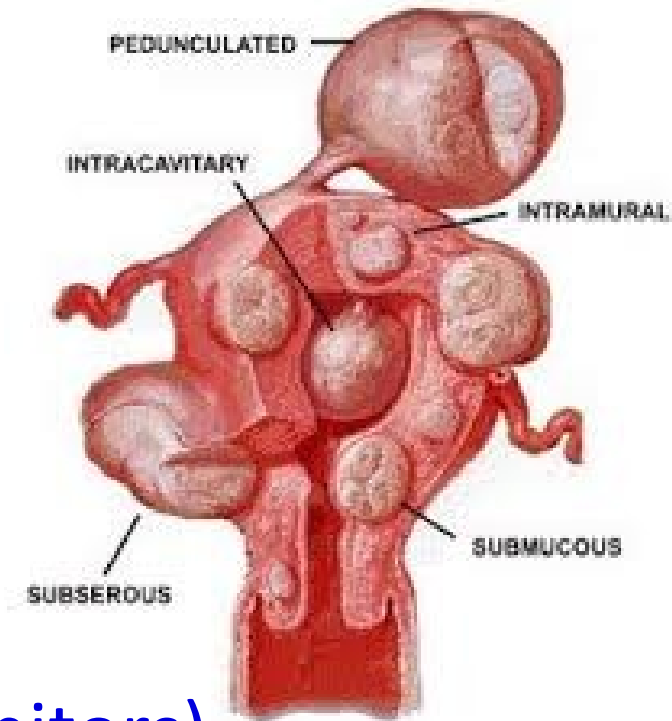


Intensity disorders

- **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

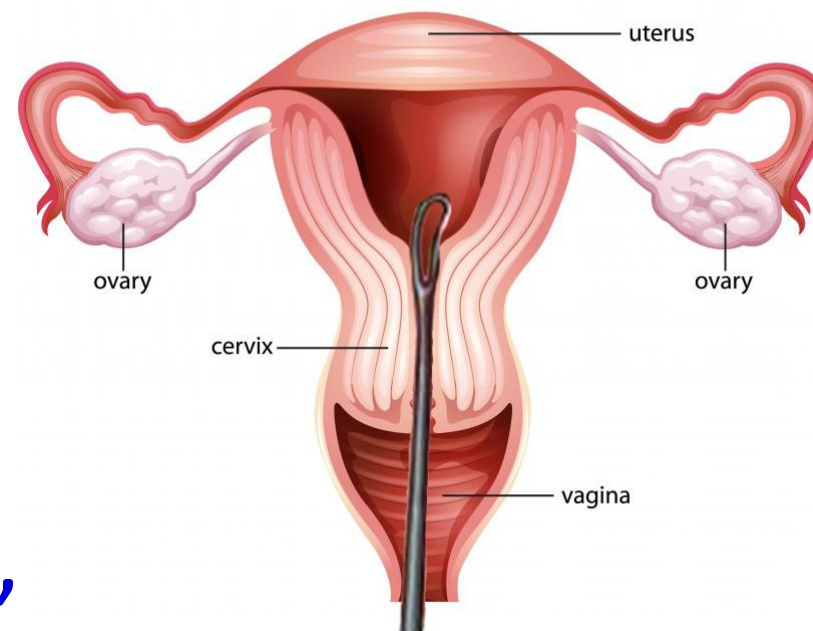
- **Menstrual calendar**
- **Gynaecologic examination** (polyyps, fibroids)
- **Ultrasound** (endometrium thickness, fibroids...)
- **Hormonal examination**
 - FSH, LH, Prolactine, E2, Progesterone
 - Testosterone, SHBG, TSH, T₄
- **Functional cytology**

Diagnosis

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

Therapy

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



**Thank you
for your attention**

