

# Histo.UGS

## Female Reproductive System

Consists of the **uterus**, **fallopian tubes**, and **vagina**, each with specialized histological features.

### ➤ Uterus

#### Structure

- Pear-shaped organ attached to the uterine tube (upper end) and vagina (lower end).
- Divided into three regions: **fundus**, **body**, and **cervix**.

#### Wall Layers

1. Endometrium (mucosa/lining)
2. Myometrium (muscular layer)
3. Perimetrium (external layer)

#### ▪ Perimetrium

- Anterior portion: adventitia بال (areolar connective tissue).
- Remaining portion: serosa بال (simple squamous mesothelium on areolar

connective tissue).

#### ▪ Myometrium

- **Thickest** layer, smooth muscle with connective tissue.
- **Inner Layer** (stratum submucosa): thin, longitudinal and circular muscle fibers. تساهم بالانقباضات الخفيفة
- **Middle Layer** (Stratum Vasculare): **thick**, **highly vascularized**, **irregular** muscle arrangement; contains **arcuate arteries**. -> مسؤولة عن الانقباضات القوية (الولادة)
- **Outer Layer** (stratum subserosum): mostly longitudinal fibers. تساعد بدفع الجنين للخارج

- ✓ **Hormonal Influence: Estrogen-dependent**; thickens during pregnancy (hyperplasia/hypertrophy); **relaxin** decreases activity until labor, produced by corpus luteum. **oxytocin** triggers contractions during labor, produced by neurohypophysis (Posterior lobe of pituitary gland). ¶

#### ▪ Endometrium

- **Before Puberty/Menopause**: Simple cuboidal epithelium, scant stroma نسيج ضام خفيف, rudimentary glands غدد غير مكتملة النمو
- **Reproductive Years**: Ciliated and secretory columnar epithelium, dense lamina propria, coiled tubular glands.

Layers:

- ❖ **Functional Layer**: Superficial, sloughed during menstruation, vascularized by **spiral arteries**. تخضع للتغيرات الهرمونية، إذا لم يحصل حمل، تُطرح خلال الحيض
- ❖ **Basal Layer**: Deep, retained after menstruation ثابتة, regenerates functional layer, supplied by **straight arteries**.

#### Blood Supply

**Uterine artery** → **arcuate** arteries (myometrium) → **radial** arteries (endometrium) ->

- Straight arteries: Supply basal layer.

- Spiral arteries: Supply functional layer.

### Menstrual Cycle

1. **Menstrual Phase** (Days 1-4): Shedding of functional layer.
2. **Proliferative (Follicular) Phase** (Days 5-14): **Estrogen-driven** regeneration; glands proliferate, arteries grow.
3. **Ovulation** (Around Day 14): Functional layer restored.
4. **Secretory (Luteal) Phase** (Days 15-28): **Progesterone** from **corpus luteum**; glands coil and secrete, endometrium thickens استعداده لتكوّن الجنين.
  - If **no** fertilization: **Hormone drop** ↓ → **spiral arteries constrict** → بالتالي نقص التروية → functional layer **sloughs off (menses)**.

### ➤ Uterine Cervix يربط بين الرحم والمهبل

#### Mucosa

- ❖ **Endocervix**: Mucous-secreting, **partially** ciliated simple columnar epithelium.
- ❖ **Vaginal part**: Stratified squamous **non**-keratinized epithelium مشابهة لبطانة المهبل.
  - **Transformation Zone**: Abrupt transition (**common site for cervical cancer**); nabothian follicles/cysts may form لانسداد فتحات الغدد.
  - **Glands**: **Branched tubulo-alveolar**, **no** spiral arteries; **do not slough** during menstruation.
  - **Secretions**: ١ Thin, **alkaline** mid-cycle وقت الإباضة; ٢ thick, viscous post-ovulation.
  - **Lamina Propria**: Dense connective tissue, elastic fibers, few smooth muscle cells.

#### Muscular Layer

- **Inner circular** and **outer longitudinal muscle layers**.
- ✓ Cervical softening at parturition (عملية الولادة) due to **collagen lysis**. خلال عملية الولادة يحدث تليين للعنق لتوسعته ولتسهيل مرور الجنين

### ➤ Uterine (Fallopian) Tube

#### Segments

1. **Intramural**: Within uterine wall, Shortest and narrowest part of the tube.
2. **Isthmus**: Narrow part Adjacent to uterus, Has a thick wall and narrow lumen.
3. **Ampulla**: **Dilated region**, Site of fertilization
4. **Infundibulum**: Funnel-shaped, fimbriae near ovary.

#### Histology

- **Mucosa**: Longitudinal folds (**prominent in ampulla**), simple columnar epithelium (١ ciliated and تحرّك البويضة للرحم and ٢ secretory peg cells).
- **Nonciliated Peg cells**: Secrete nourishing fluid for sperm and zygote.
- **Lamina propria**: Loose connective tissue, **reticular cells**, fibroblasts, mast cells, lymphoid cells.
- **Muscularis**: Poorly defined inner circular and outer longitudinal smooth muscle; peristalsis and cilia move oocyte.

- **Serosa:** Connective tissue with simple squamous epithelium, blood vessels, nerves.

### ➤ Vagina

#### Mucosa

- **Epithelium:** Thick stratified squamous **non**-keratinized, rich in glycogen.
- **Lamina propria:** Dense, highly vascularized connective tissue with elastic fibers.
- **No glands**! : Lubrication from transudate and cervical secretions.
- **Flora**” Lactobacilli”: Bacteria metabolize glycogen to lactic acid يحمي من العدوى

#### Hormonal Influence

- **Before puberty/after menopause:** Thin epithelium.
- **Reproductive years:** Thickens under estrogen (↑ mitosis, ↑ glycogen/lipid accumulation).

#### Muscular & Adventitia Layers

- Muscular: Circular and longitudinal smooth muscle fibers.
- Adventitia: Fibro-collagenous tissue, elastic fibers for distension, vessels, nerves.

### ✓ Summary

Structure	Epithelium Type	Special Features
Uterus	Ciliated/secretory columnar	Functional/basal layers, glands, cycles
Cervix	Simple columnar → squamous	Transformation zone, nabothian cysts
Fallopian Tube	Ciliated/secretory columnar	Mucosal folds, peg cells, peristalsis
Vagina	Stratified squamous non-keratinized	Glycogen-rich, elastic lamina propria

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