Anatomy and Physiology of Reproduction

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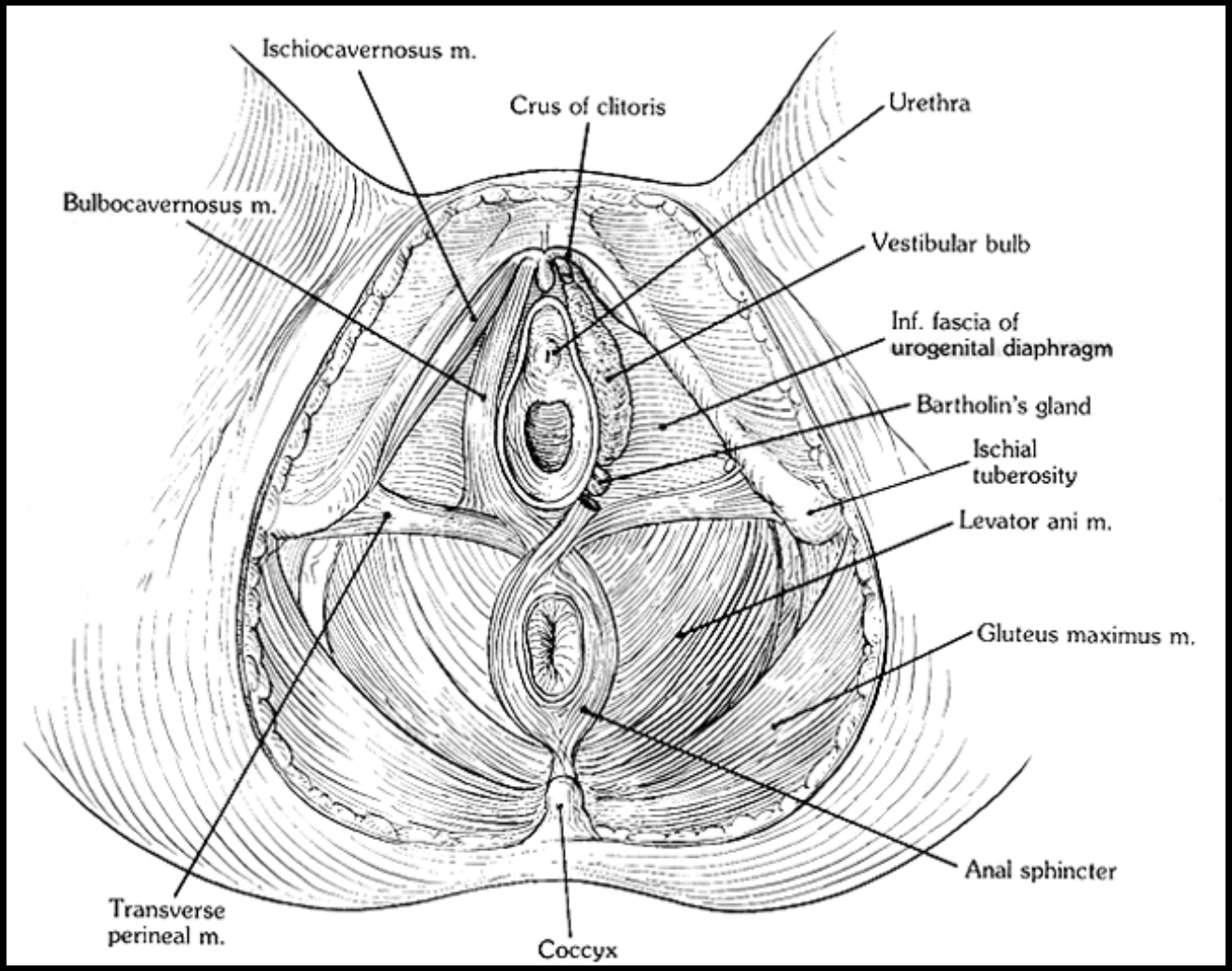
Anatomy: Perineum

- The perineum is the inferior boundary of the pelvis

Anatomy: Perineum

- Superior border: levator ani muscles
- Inferior border: skin between the thighs
- Anterior border: symphysis pubis
- Posterior border: ischial tuberosities, sacrotuberous ligament, coccyx

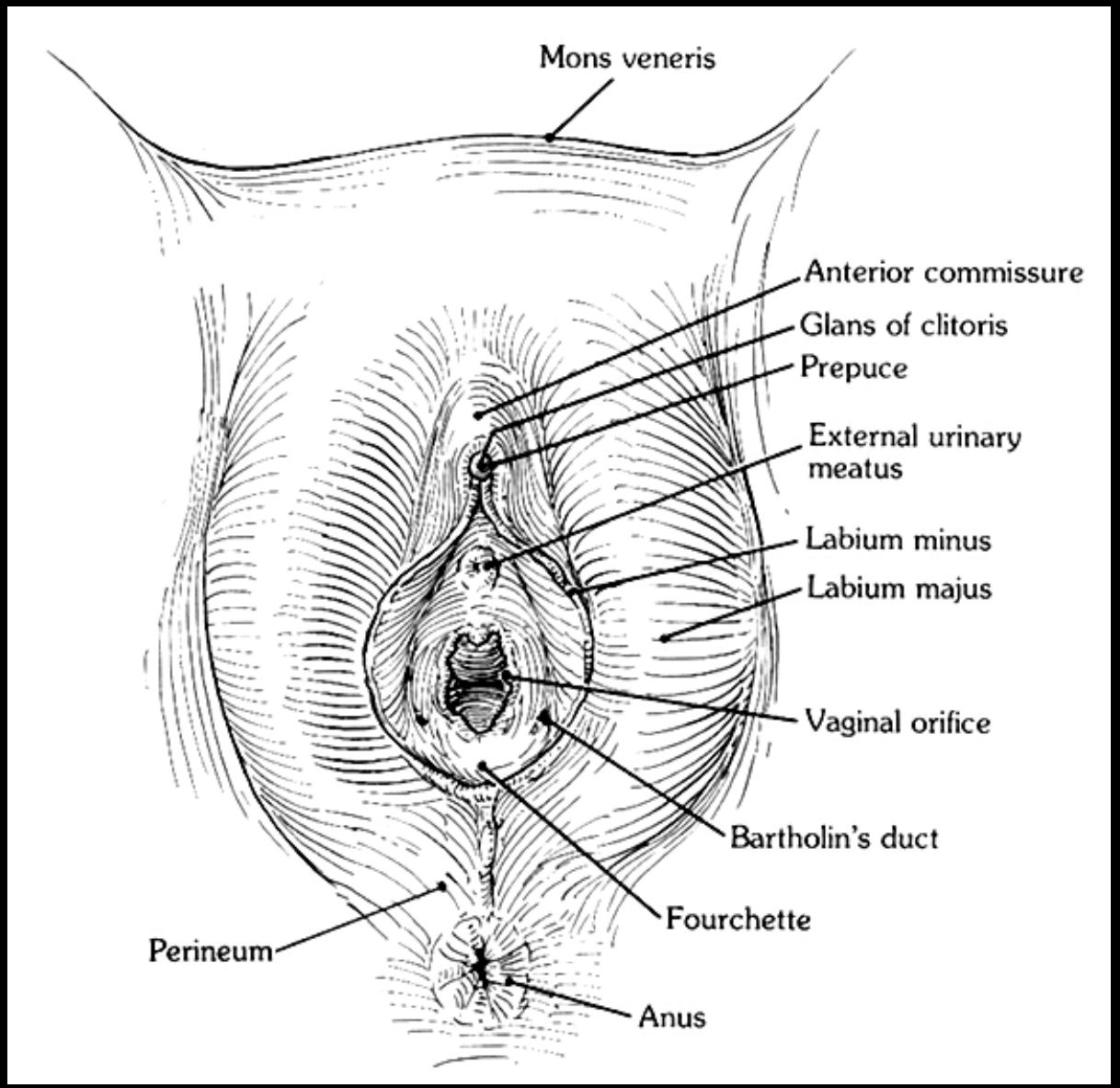
Anatomy: Perineum, Picture



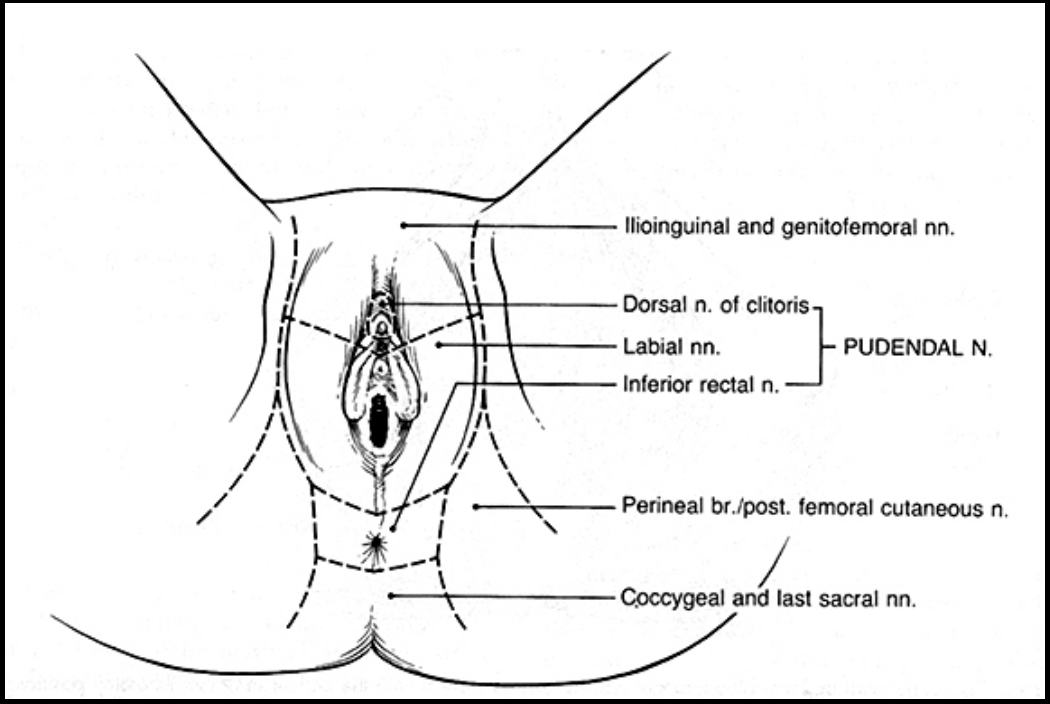
Anatomy: External Genitalia

- Comprised of the mons pubis, labia minora, clitoris, Bartholin's glands, posterior fourchette and perineum

External Female Genitalia



Anatomy: External Genitalia



Innervated mostly by the pudendal nerve, with exception of the anterior urethra which is innervated by the ilioinguinal and genitofemoral nerves

Anatomy: Vagina

- Histology: Stratified squamous epithelium
- Non-keratinized; devoid of mucous glands and hair follicles
- Deep to the epithelium are the muscular coats of the vagina (outer longitudinal, inner circular)

Anatomy: Vagina

- Gartner's duct cysts may be found in the subepithelial layers of the vagina (remnants of the mesonephric ducts)
- Posterior vagina allows access to the Pouch of Douglas (cul-de-sac)

Anatomy: Vagina

- Bladder sits above, rectum sits below
  - Relaxation of anterior vagina can lead to cystocoele
  - Relaxation of posterior vagina can lead to rectocoele
  - Relaxation of potential space between post vagina and rectum can lead to enterocoele

Anatomy: Cervix Uteri

- Cervix generally 2 to 3 cm in length
- Portion protruding into vagina covered in nonkeratinizing squamous epithelium
- Endocervix with simple columnar epithelium
- Site of transition from squamous to columnar epithelium known as the squamocolumnar junction

Anatomy: Uterus

- Body of uterus is largely smooth muscle cells; endometrial lining is glandular and typically 2-10 mm thickness
- Four sets of ligaments on uterus;
  - supportive of uterus (cardinal, uterosacral ligaments)
  - non-supportive of uterus (round, broad ligaments
- Uterosacral ligaments also carry sympathetics and parasympathetics
- Broad ligament encompasses round ligament, ovarian ligaments, nerves, vessels, lymphatics

Anatomy: Fallopian Tubes

- Fallopian tubes are bilateral muscular tubes with highly mobile fimbriated ends; lumina covered with ciliated columnar epithelium

- Portions of fallopian tube:
  - Interstitial
  - Isthmic
  - Ampullary
  - Fimbriated

Anatomy: Ovaries

- Ovaries are normally about 2x3 cm in size and suspended between the ovarian ligament medially and the infundibulopelvic ligament laterally.
- Have both germ cells and epithelial cells
- Ovarian arteries arise from aorta, venous drainage on the right is into the IVC and from the left is into the left renal vein

Anatomy: Course of the Ureter

- Crosses at bifurcation of internal and external iliac
- Descends into pelvis along the medial leaf of the broad ligament
- Dives under the uterine artery at the level of the cervicouterine junction (“water under the bridge”)

Anatomy: Lymph Drainage of Pelvis

- Vulva and lower vagina drain into inguinofemoral nodes and then to external iliac chains
- Cervix drains through cardinal ligament to the pelvic nodes (hypogastric, obturator and external iliac groups) and then to common iliacs and paraaortic chains
- Endometrium drains through broad ligament and IP ligament to pelvic and paraaortic chains
- Ovaries drain through IP ligament to pelvic and paraaortic nodes

Anatomy: Pituitary Gland

- Pituitary lies below hypothalamus in the sella turcica and has two lobes:
  - *posterior lobe*
    - produces oxytocin and vasopressin (ADH)
  - *anterior lobe*
    - produces FSH, LH, TSH, Prolactin, GH, ACTH

Physiology: Hypothalamic-Pituitary Axis

- GnRH is released from arcuate nucleus in hypothalamus in a pulsatile fashion throughout menstrual cycle. It acts on the anterior pituitary to release FSH and LH which then act on the ovaries to produce follicles, this leads to ovulation and corpus luteum formation
- A constant level of GnRH actually "down regulates" release of LH and FSH from anterior pituitary

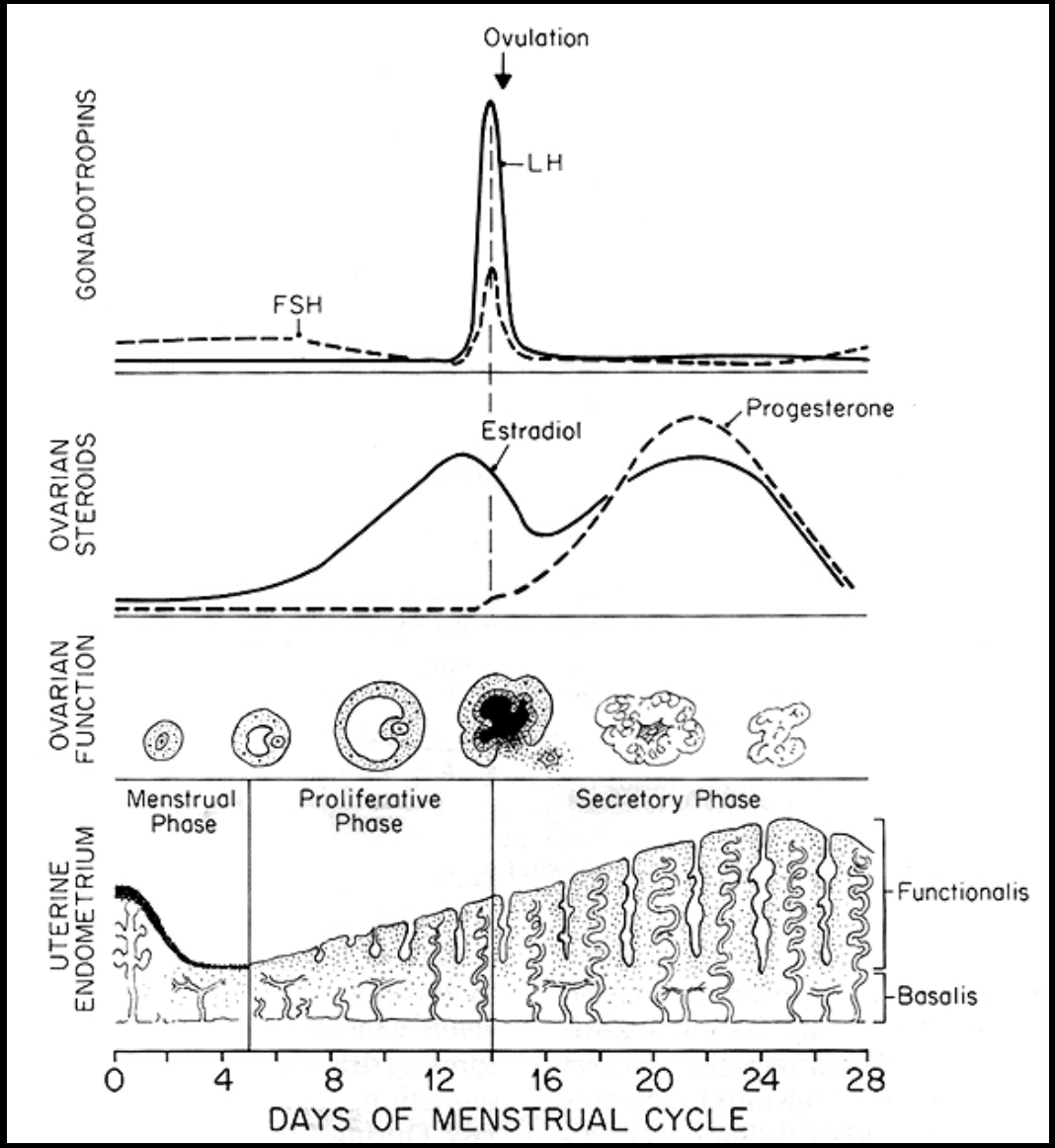
Physiology: The Menstrual Cycle

- Divided into 2 phases
  - Follicular (proliferative)
  - Luteal (secretory)
- Follicular phase begins with onset of menses and ends with LH surge; luteal phase begins with LH surge and ends with menses

Physiology: The Menstrual Cycle

- If pregnancy doesn't occur, the progesterone and estradiol levels will start to fall and initiate a rise in FSH. FSH rise initiates follicular growth and estradiol secretion for the next cycle.
- LH rises slowly after FSH.
- Ovarian estradiol exerts a negative feedback mechanism that enhances GnRH secretion. There is a midcycle surge of LH and FSH that results in ovulation approximately 30-38 hours later.

Menstrual Cycle



Physiology: Menstrual Cycle

- Following ovulation the corpus luteum forms, which secretes progesterone and estradiol.
- The corpus luteum will survive 14 days if no pregnancy (constant among women) thus luteal phase is consistently 14 days and follicular phase determines the length of the individual's menstrual cycle