
In the name of ALLAH

Male genital system (Histology)

Anatomy

1. Testis
2. Ducts
3. Accesory glands
4. Penis

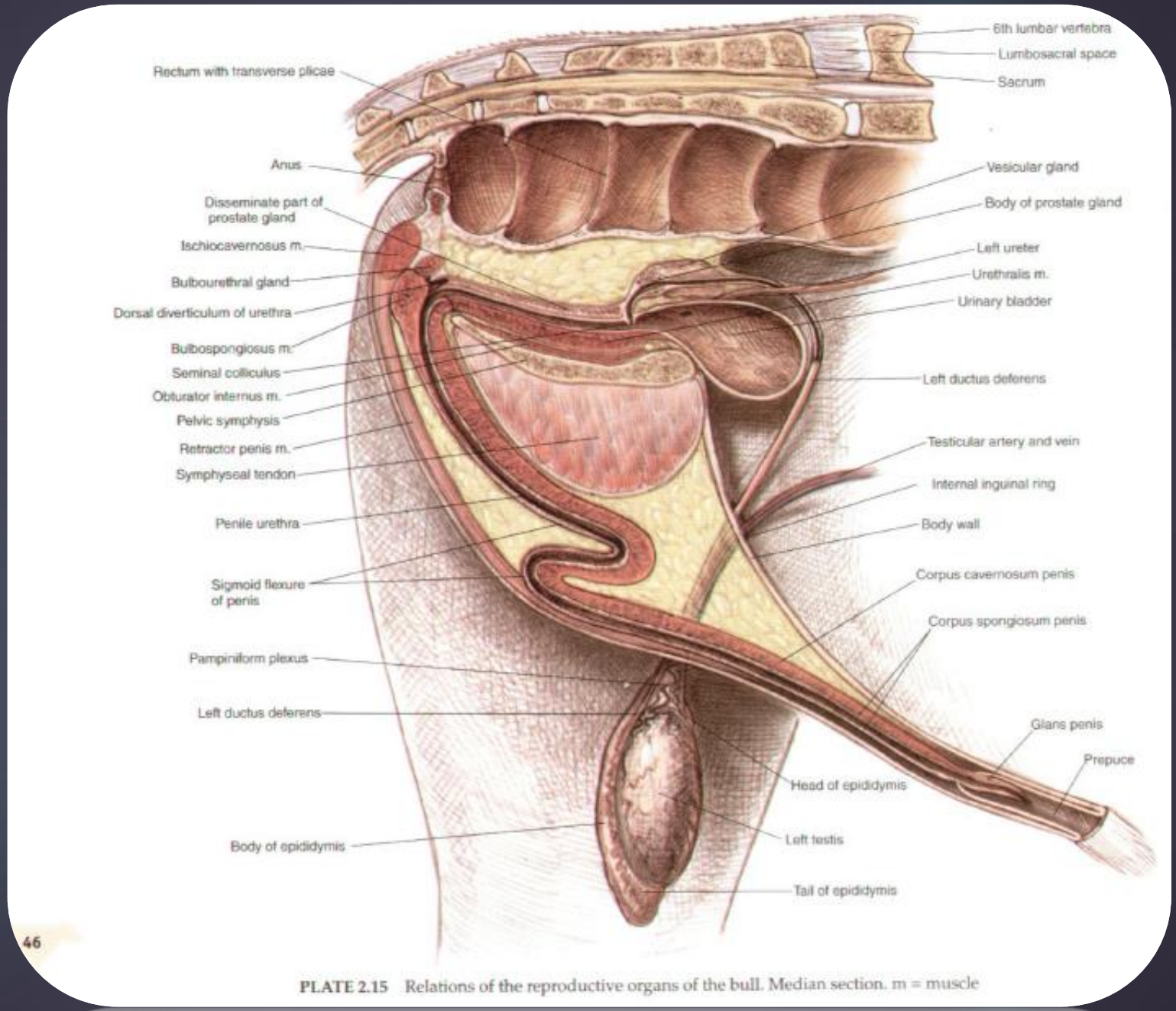
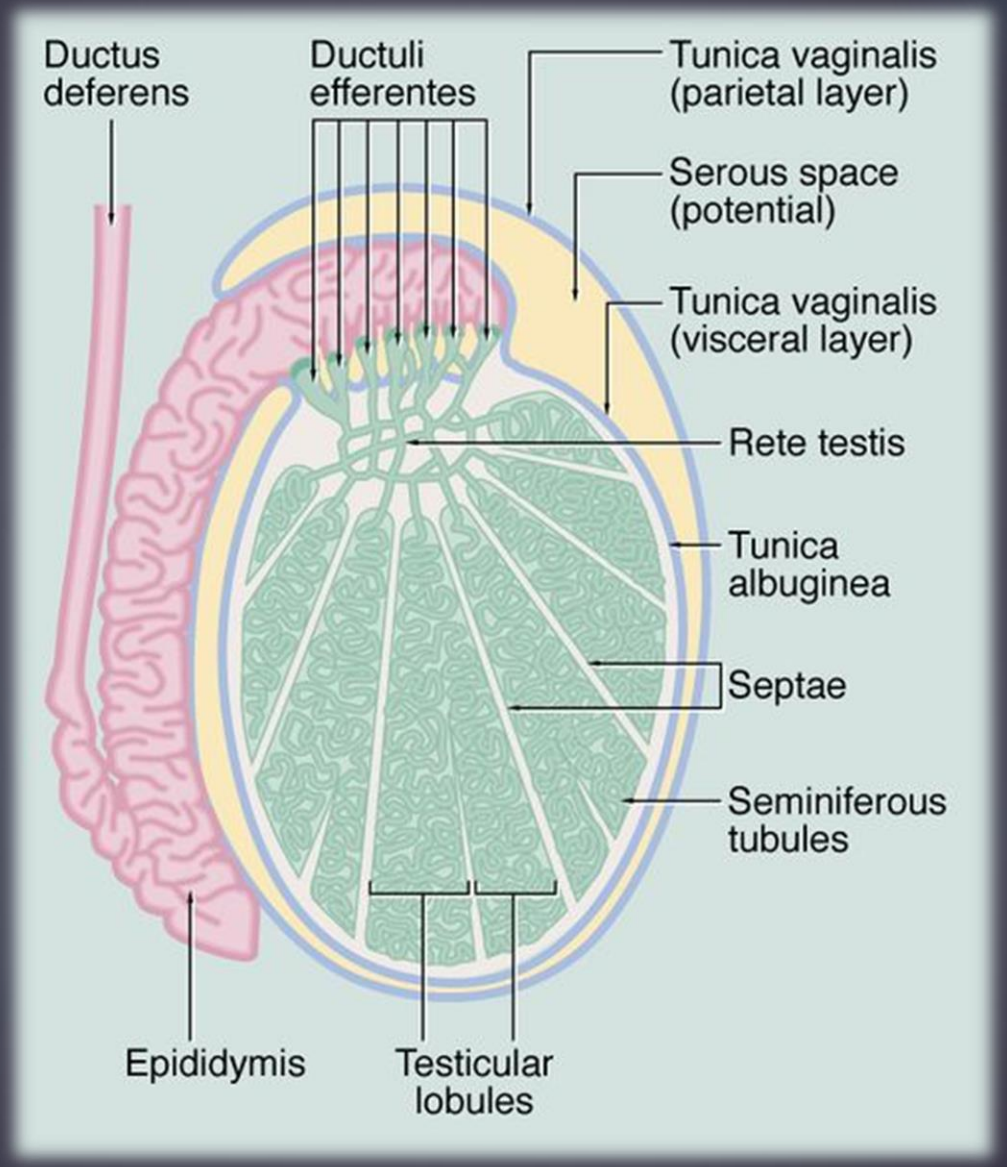


PLATE 2.15 Relations of the reproductive organs of the bull. Median section. m = muscle

Testis


Ductus deferens
Ductuli efferentes
Tunica vaginalis (parietal layer)
Serous space (potential)
Tunica vaginalis (visceral layer)
Rete testis
Tunica albuginea
Septae
Seminiferous tubules
Epididymis
Testicular lobules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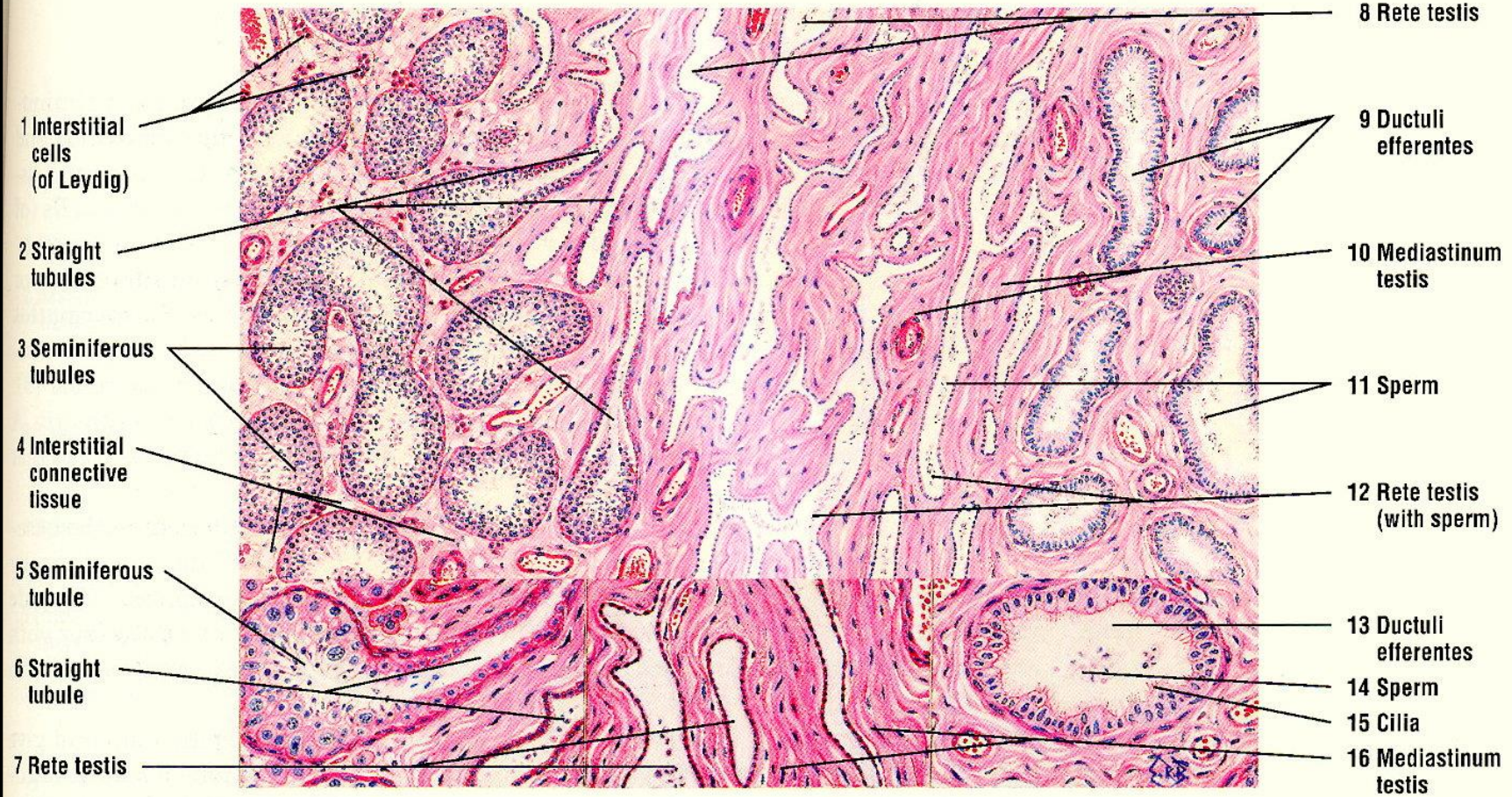


FIGURE 18.2 ■ Seminiferous tubules, straight tubules, rete testis, and ductuli efferentes (efferent ductules). Stain: hematoxylin and eosin. Low magnification (inset: high magnification).

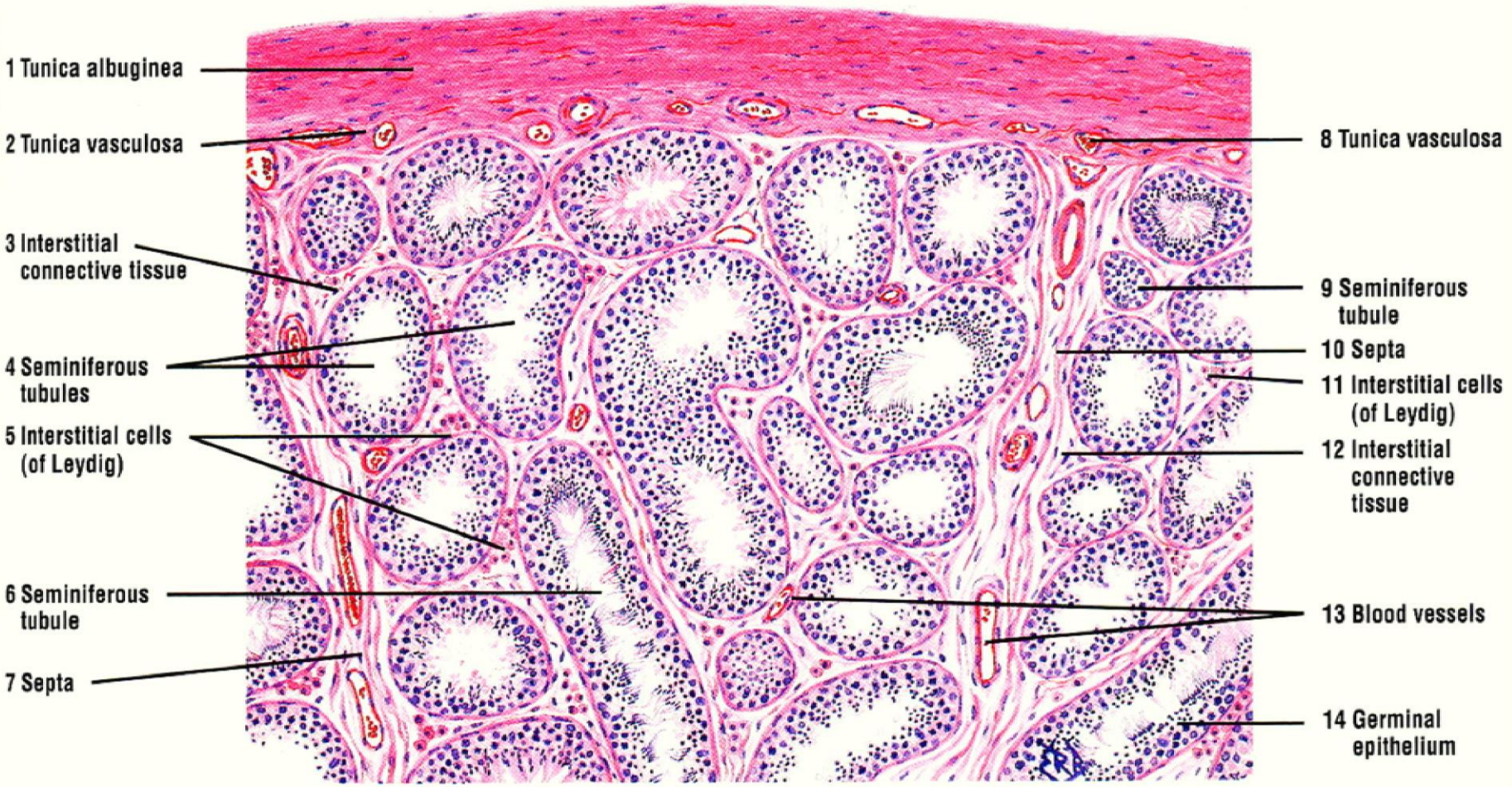
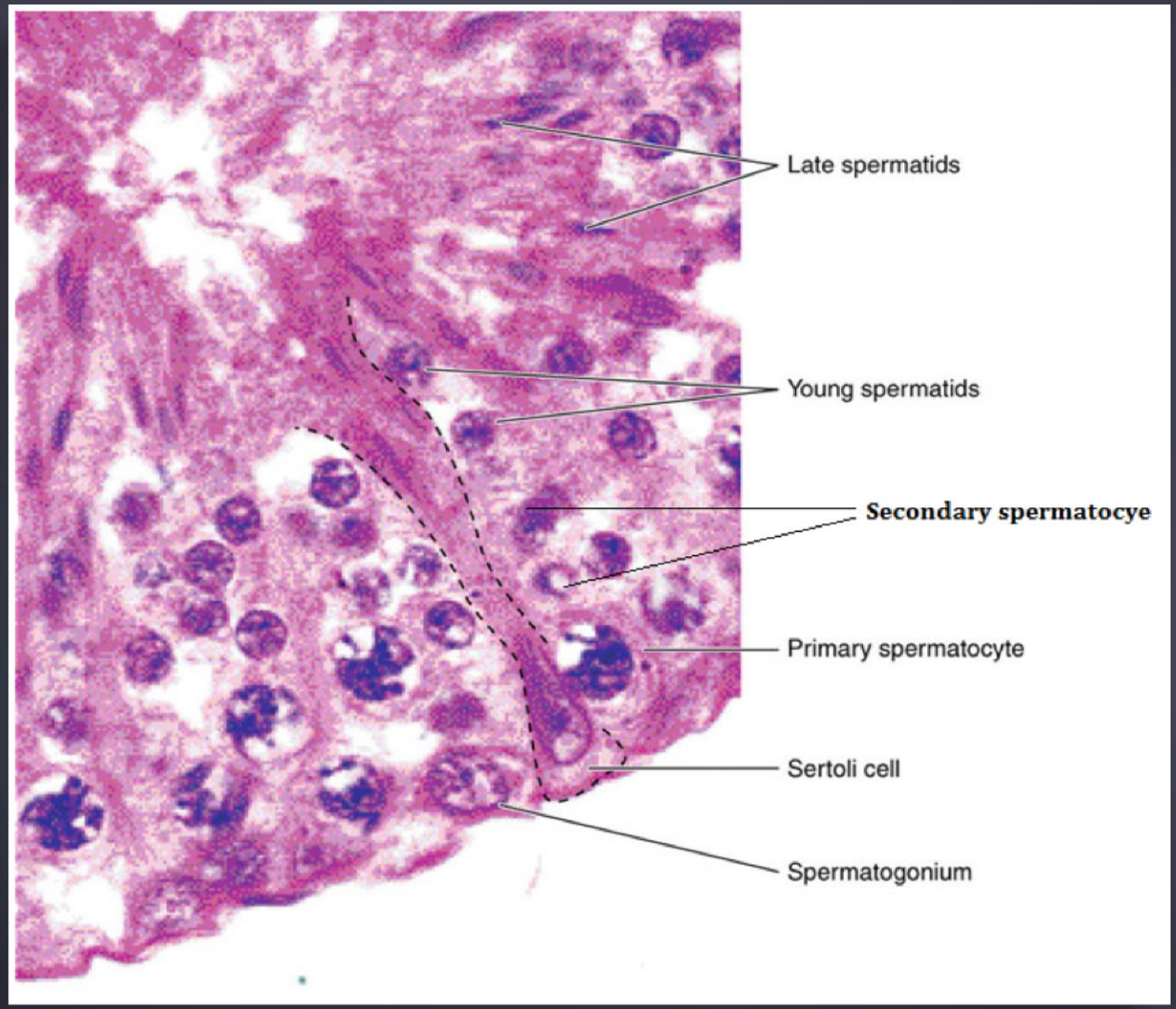
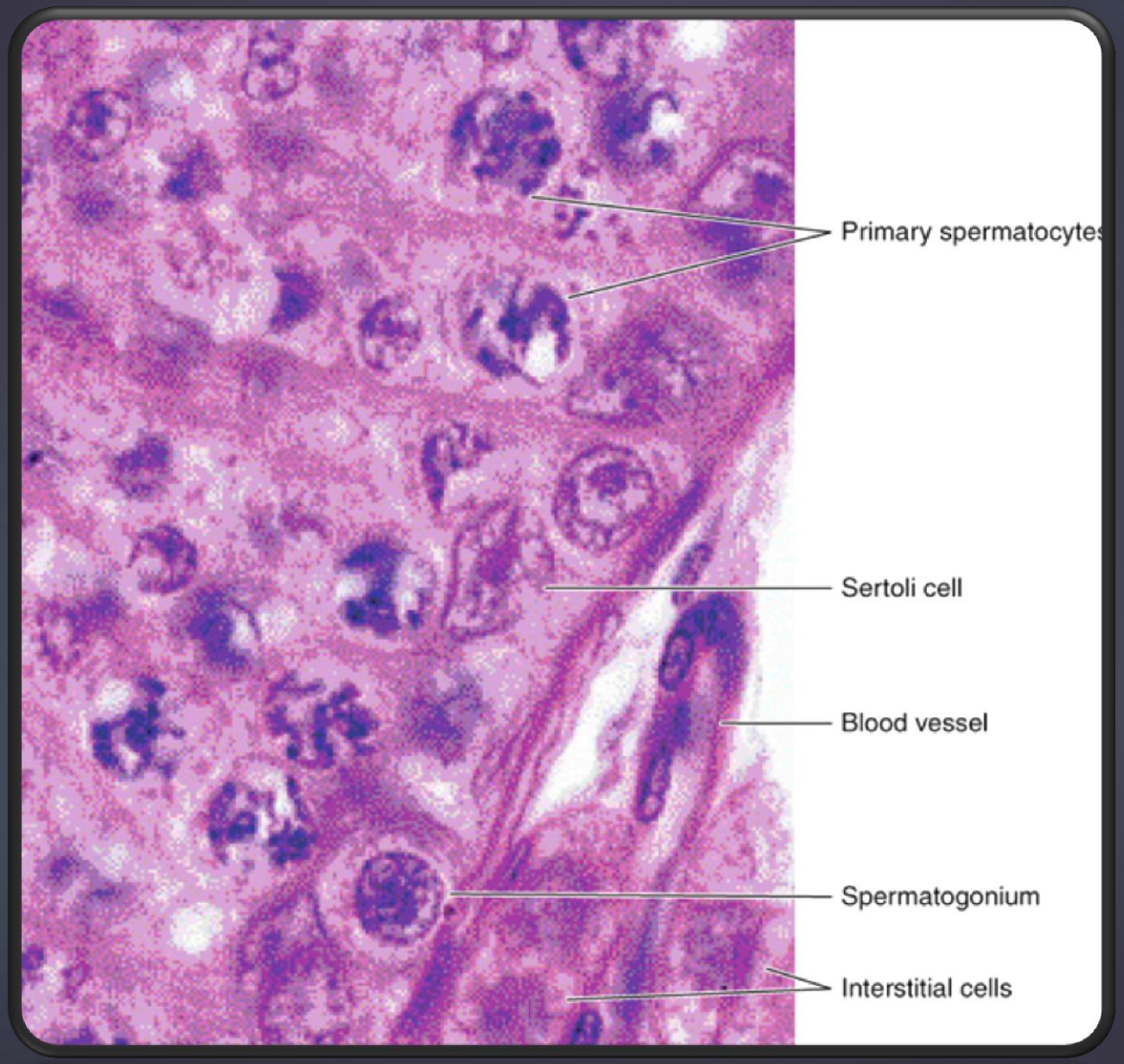


FIGURE 18.1 ■ Testis (sectional view). Stain: hematoxylin and eosin. Low magnification.

Spermatogenic Cells




Primary spermatocytes
Sertoli cell
Blood vessel
Spermatogonium
Interstitial cells

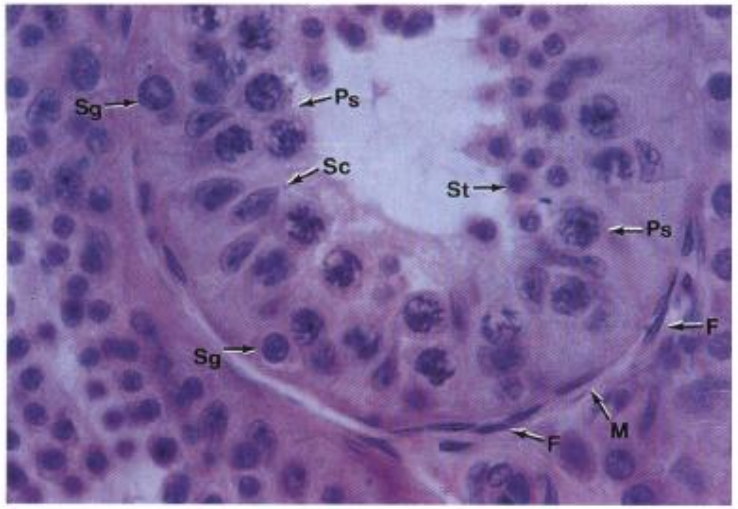
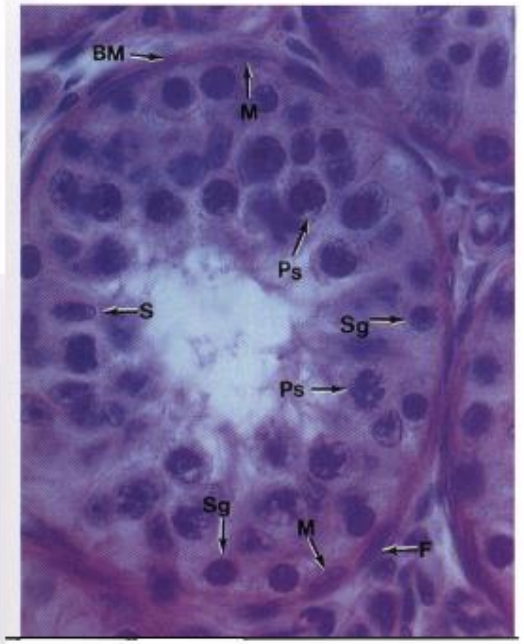


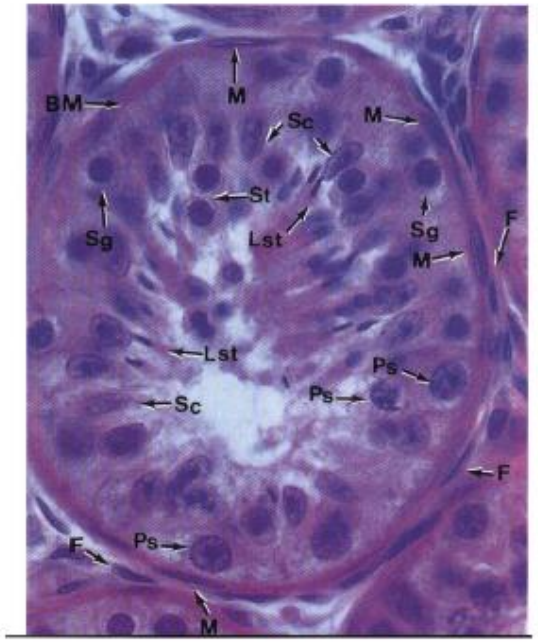
figure 18-6

FIGURE 18-6
High-power photomicrograph of a seminiferous tubule showing spermatogonia (Sg), primary spermatocytes (Ps), early spermatids (St), and Sertoli cells (Sc) in the epithelium. Note the nuclei of myoid cells (M) and fibroblasts (F) of the tubule. Monkey; × 756.

FIGURE 18-7
Photomicrograph of a seminiferous tubule showing a preponderance of primary spermatocytes (Ps) in its epithelium. Note the spermatogonia (Sg) and the myoid (M) and fibroblast (F) cell nuclei. A prominent basement membrane (BM) is also evident. Monkey; × 756.

FIGURE 18-8
Photomicrograph of a seminiferous tubule in which late spermatids (Lst) and Sertoli cells (Sc) are the predominant cell types in the epithelium. Note the spermatogonia (Sg), primary spermatocytes (Ps), and early spermatids (St). BM, basement membrane; M, myoid cell nucleus; F, fibroblast nucleus. Monkey; × 756.





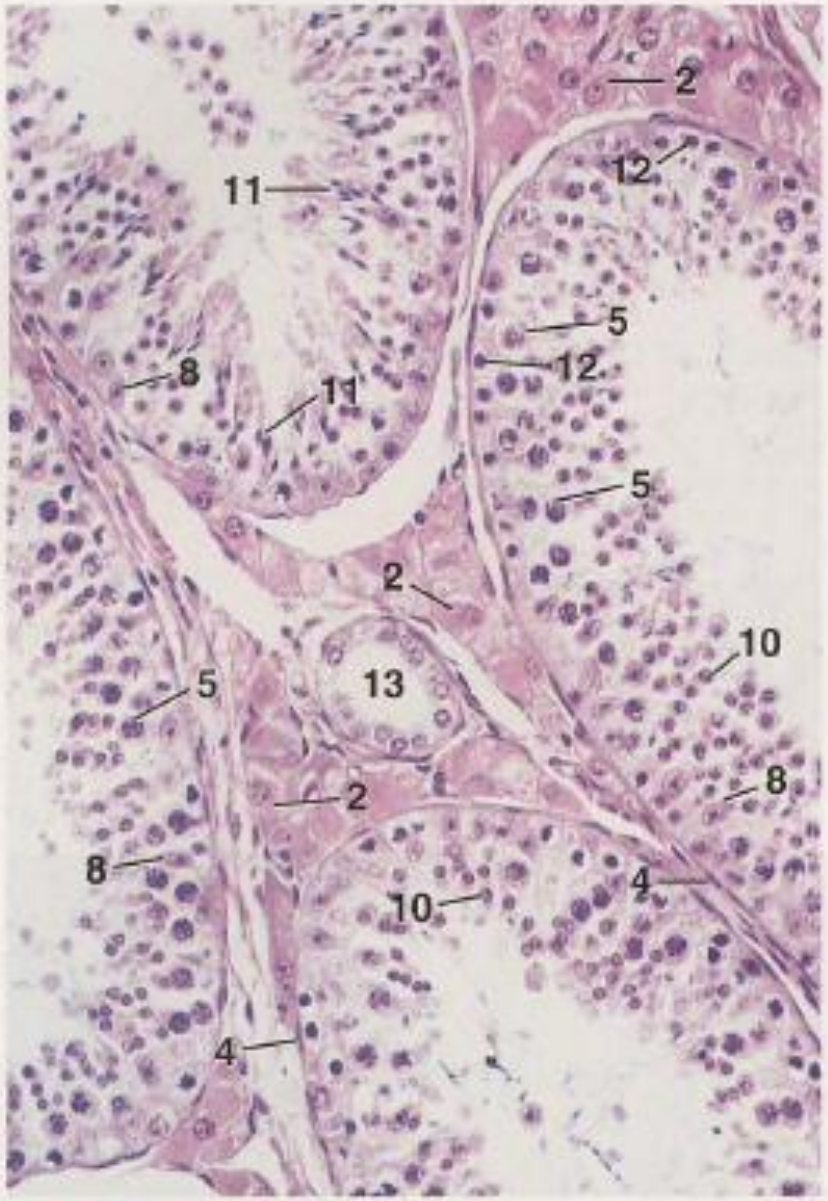


Figure 17.6 ×180

KEY

1. Efferent ductule
2. Interstitial cell
3. Mediastinum testis
4. Myoid cell, nucleus
5. Primary spermatocyte
6. Rete testis, channel
7. Seminiferous tubules
8. Sertoli cell, nucleus
9. Sertoli cells
10. Spermatid, early
11. Spermatid, late
12. Spermatogonium
13. Straight tubule
14. Transitional zone
15. Tunica albuginea

Figure 17.6. Seminiferous Tubules, Testis, Stallion. Portions of four seminiferous tubules are visible. Note the numerous interstitial cells (abundant in the boar and stallion) and the section through a straight tubule.

Figure 17.7. Interstitial Tissue, Testis, Ram. Interstitial tissue and portions of three seminiferous tubules are shown. Interstitial cells are relatively sparse in carnivores and ruminants.

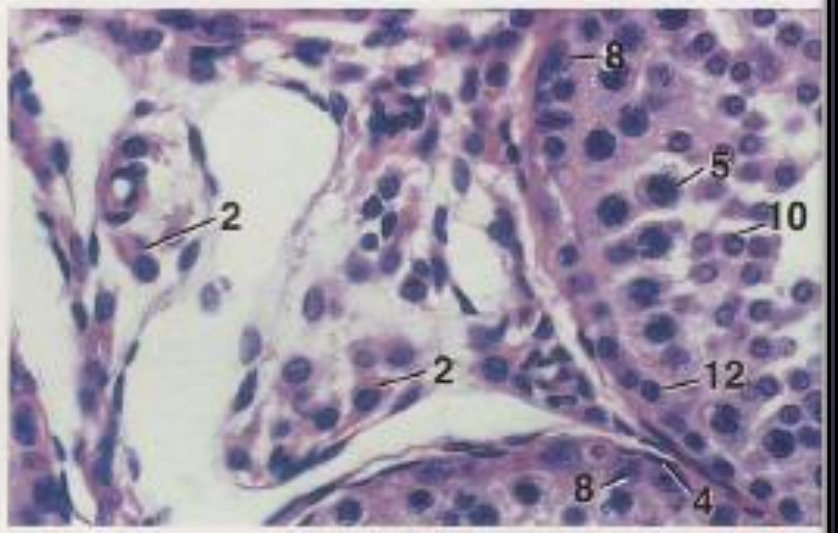
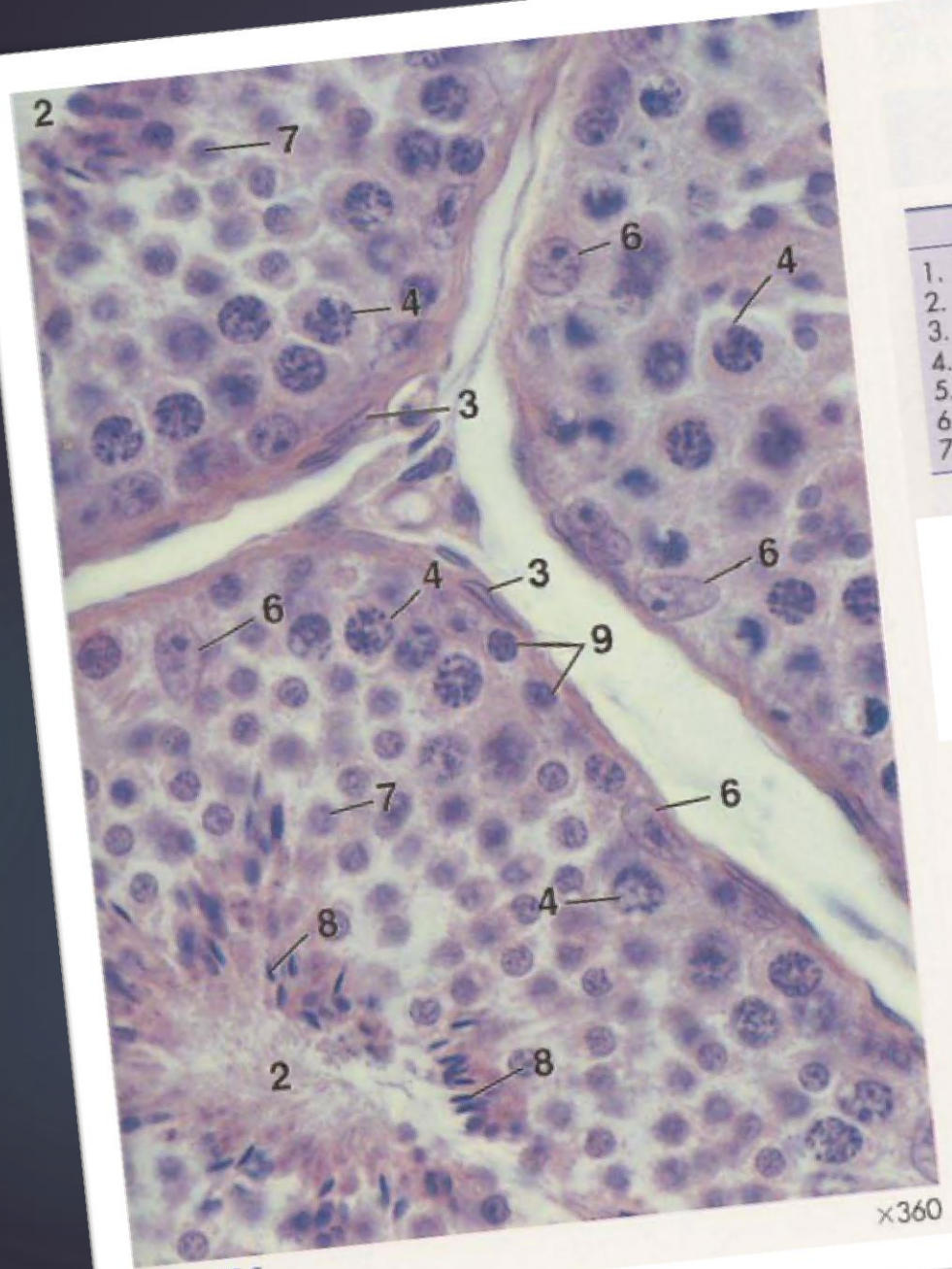


Figure 17.7 ×250



KEY	
1. Interstitial cells	8. Spermatid, late
2. Lumen	9. Spermatogonia
3. Myoid cell, nucleus	10. Tunica albuginea
4. Primary spermatocyte	11. Tunica albuginea, smooth muscle
5. Seminiferous tubule	12. Tunica albuginea, vascular layer
6. Sertoli cell, nucleus	13. Tunica vaginalis
7. Spermatid, early	

Figure 17.5. Seminiferous Tubules, Testis, Dog. A portion of each of three adjacent seminiferous tubules is shown.

Figure 17.5

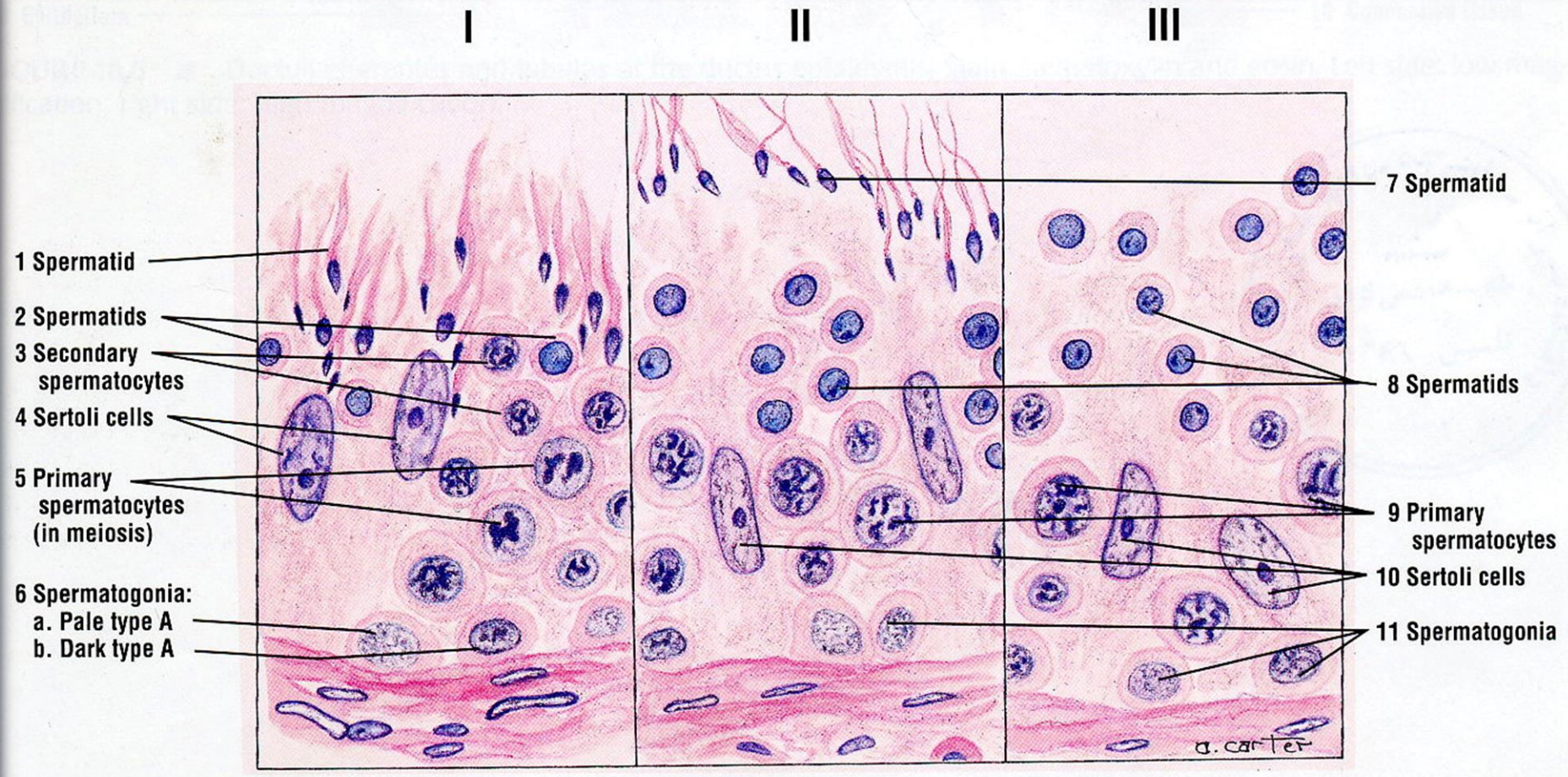
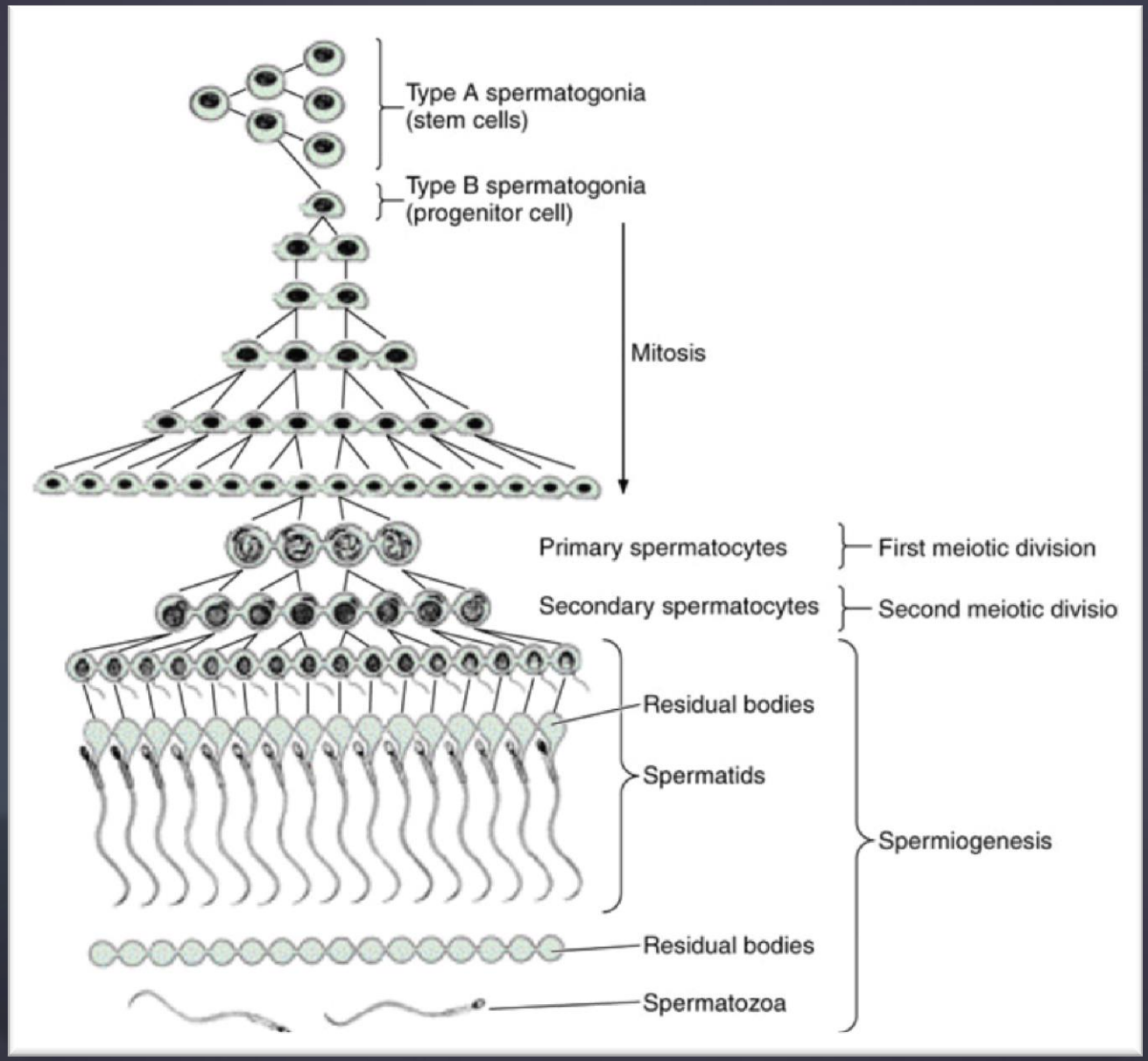


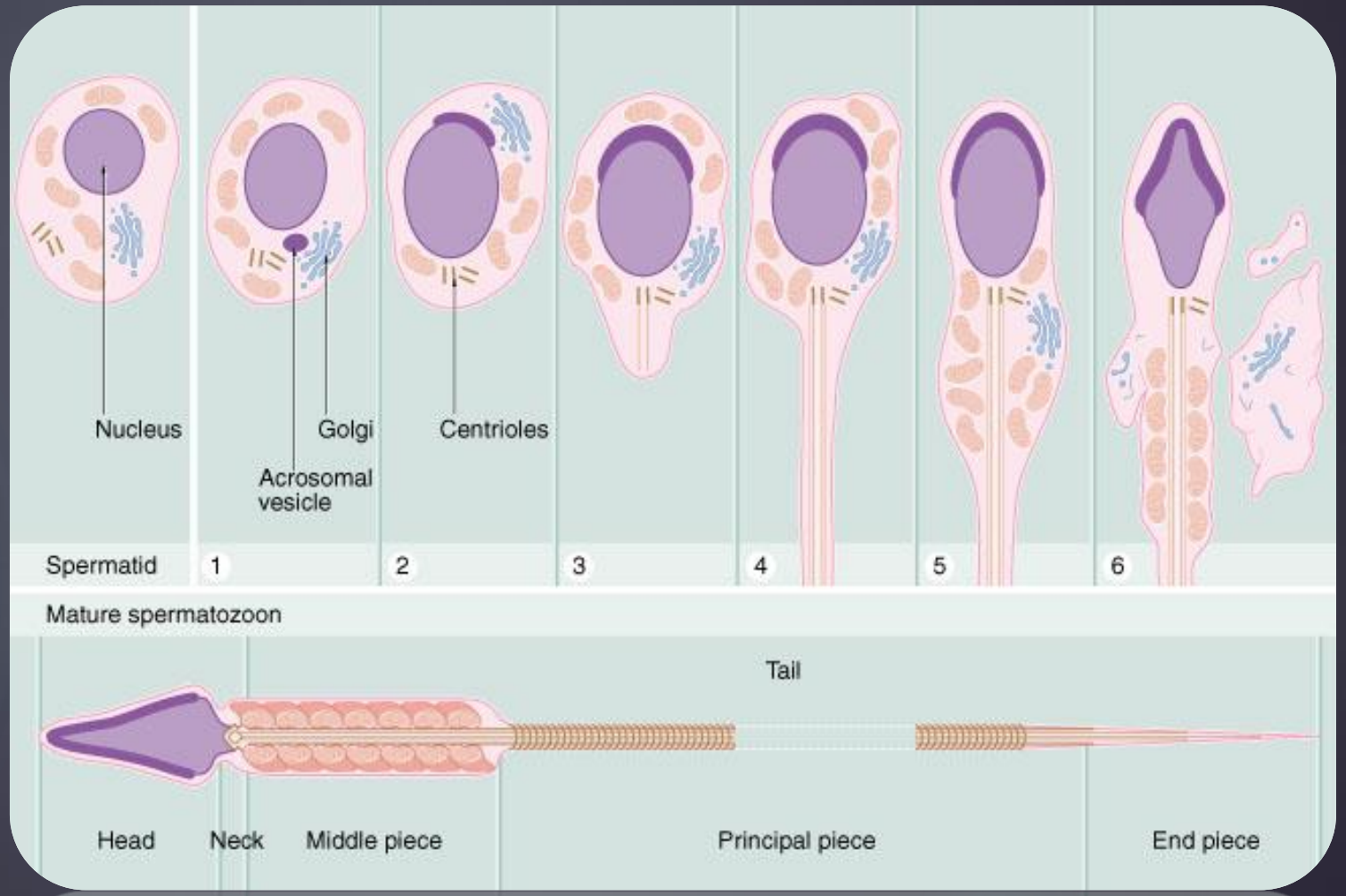
FIGURE 18.4 ■ Primate testis: stages of spermatogenesis. Stain: hematoxylin and eosin. High magnification.

Spermatogenesis



Spermiogenesis

1. Golgi phase
2. Cap phase
3. Flagella phase
4. Manchette phase
5. Mitochondria phase
6. Maturation phase



Testicular interstitium

- Blood vessels
- Lymphatic vessel
- Leydig cells
  - production of testosteron
    - stimulation of spermatogenesis, maintanance of sex glands, sebaceous glands ...
    - regulated by luteinizing hormon of hypophisis

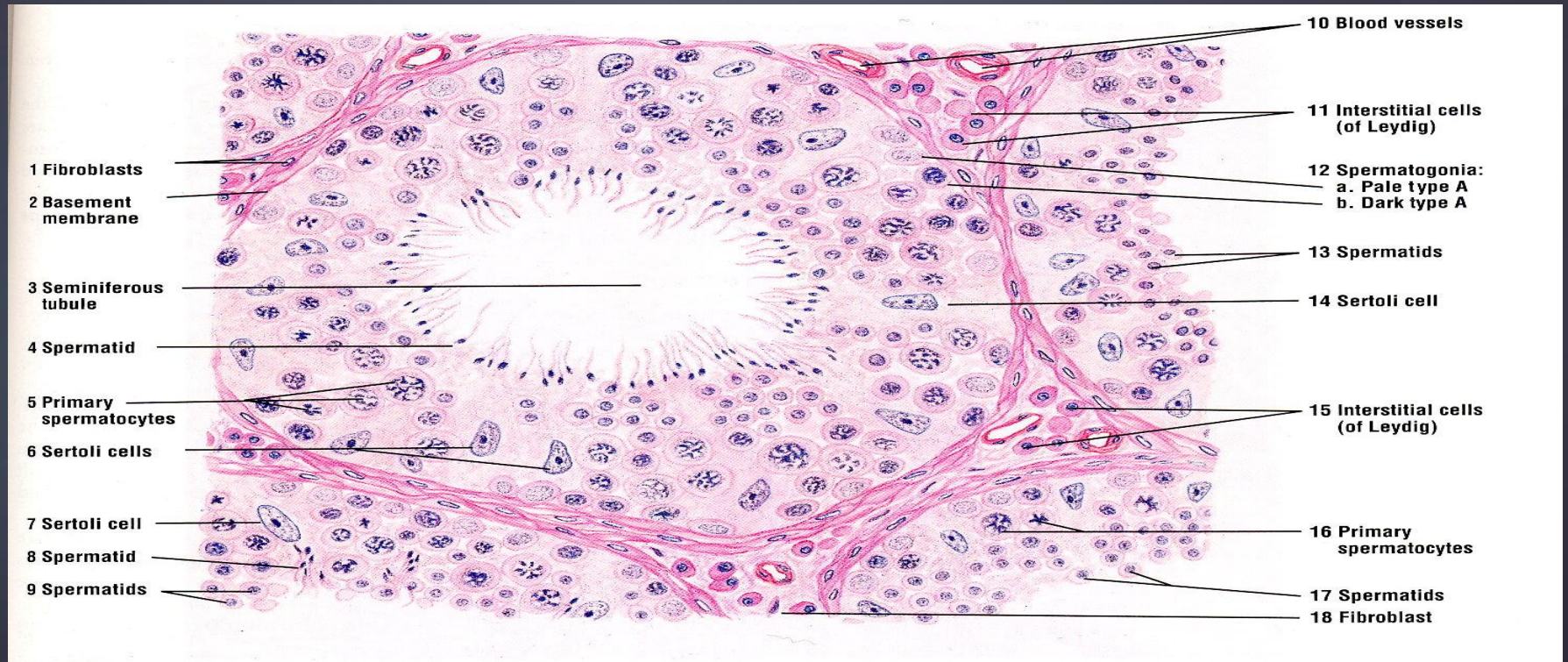
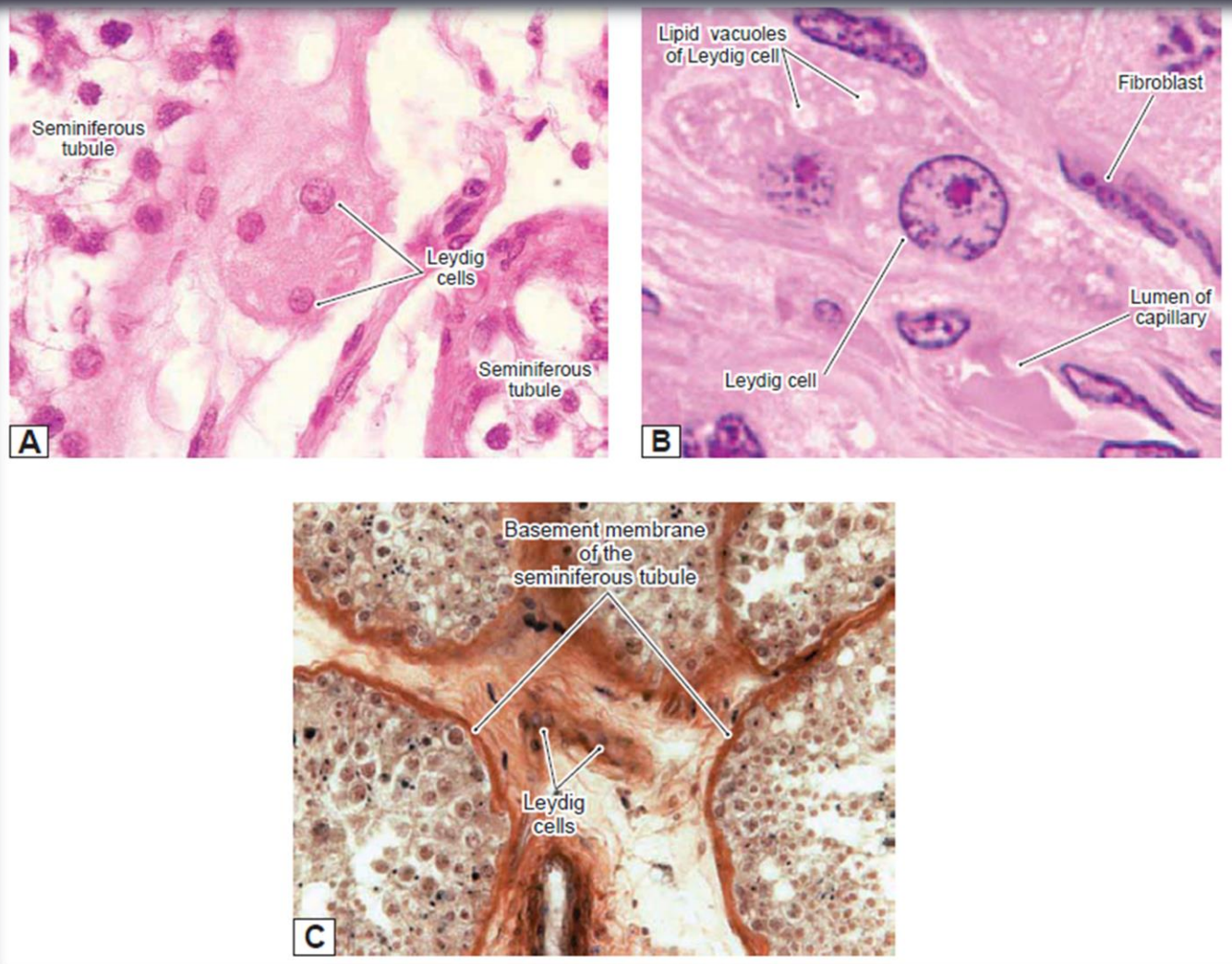


FIGURE 18.3 Primate testis: spermatogenesis in seminiferous tubules (transverse section). Stain: hematoxylin and eosin. Medium magnification

Leydig cells



Sperm maturity and transport pathway (Ducts)

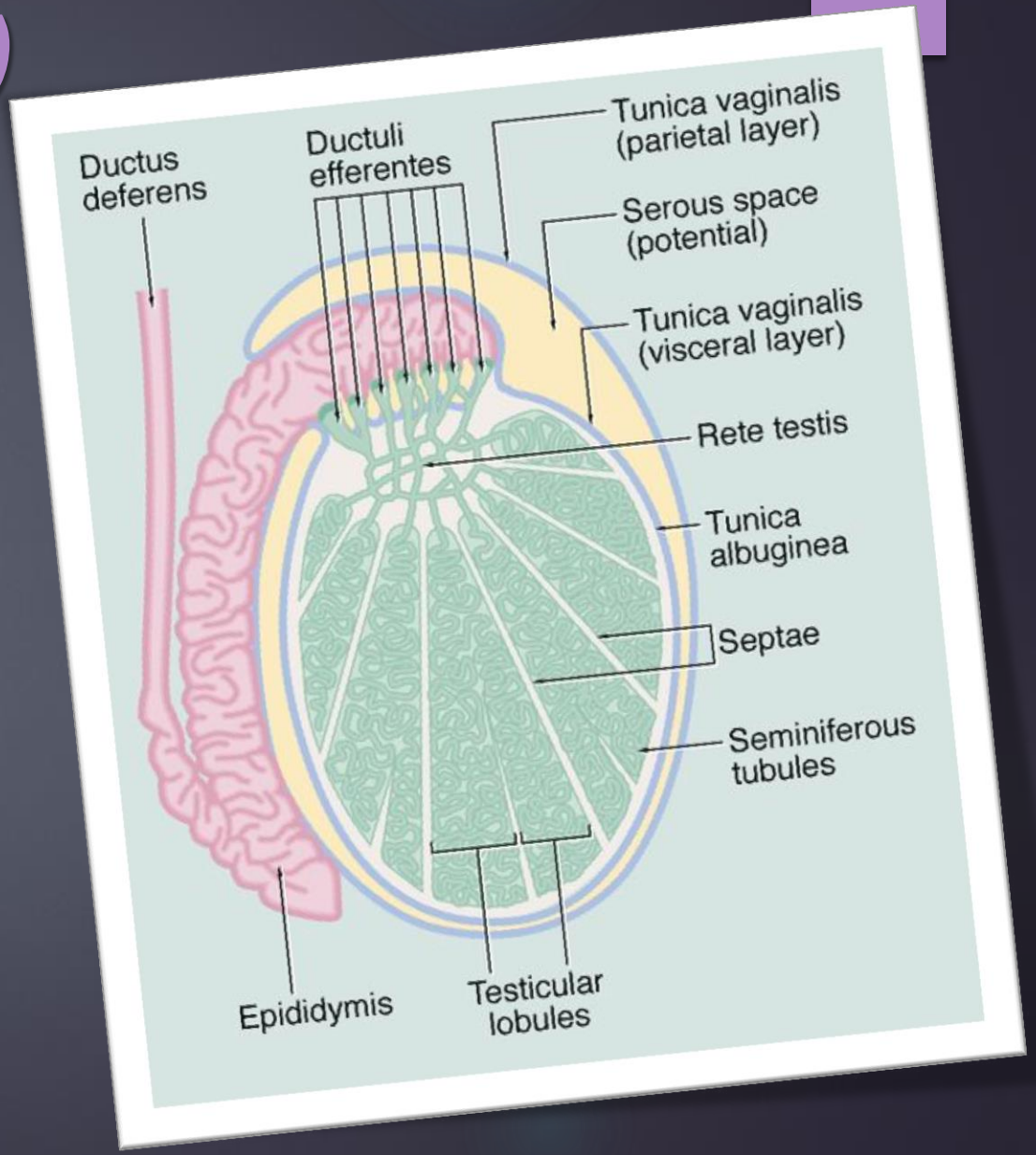
Intratesticular ducts

- **Tubuli recti et rete testis**
- **Efferent ducts**

……..

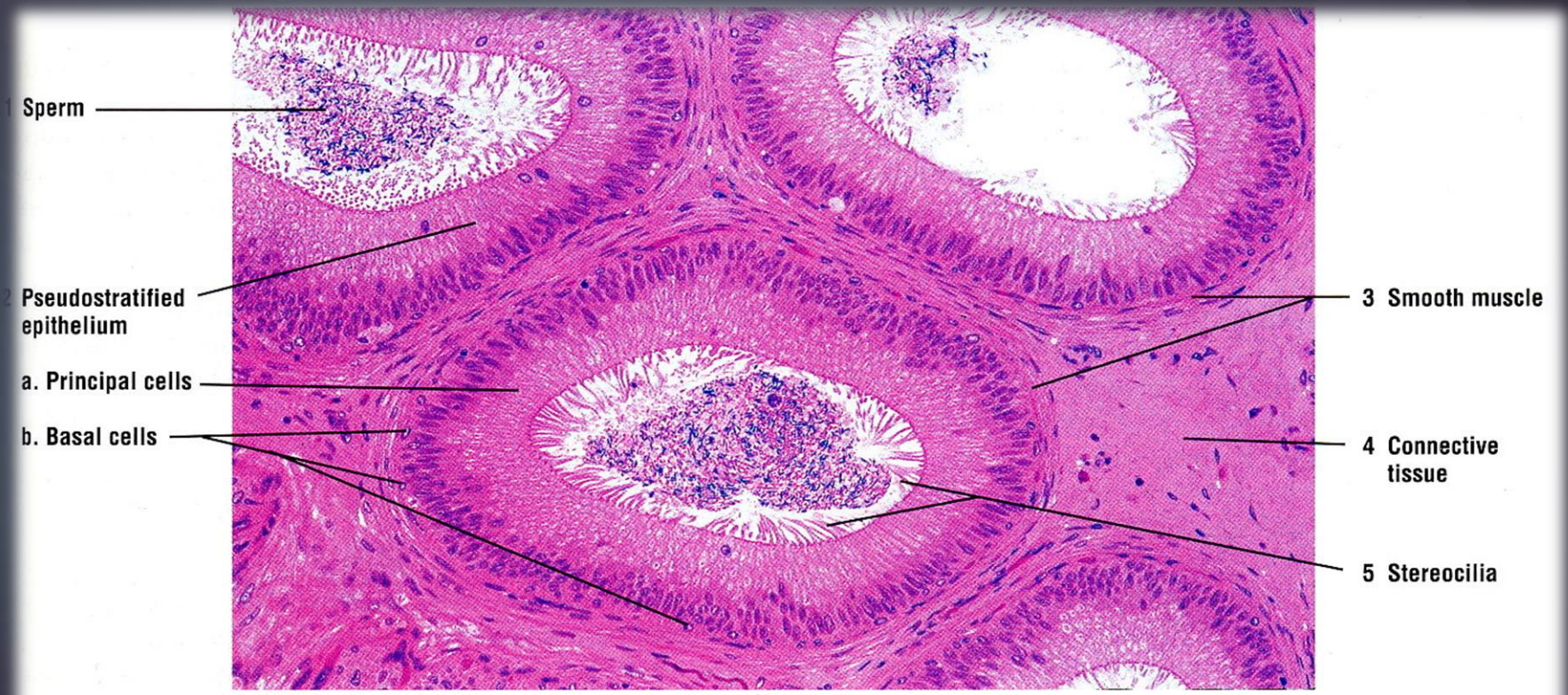
Extratesticular (excretory) ducts

- **Epididymis**
- **Ductus deferens**
- **Ejaculatory duct**
- **Urethra**



Epididymis

- Ductus epididymidis - in body & tail
  - highly coiled one tubule - 4-6 m long
  - pseudostratified columnar epi with stereocilia
  - two layers of smooth muscle - thicker
- function
  - maturation
  - storage
  - transport



GURE 18.7 ■ Tubules of the ductus epididymis (transverse section). Stain: hematoxylin and eosin (plastic section). 50×

Epididymis

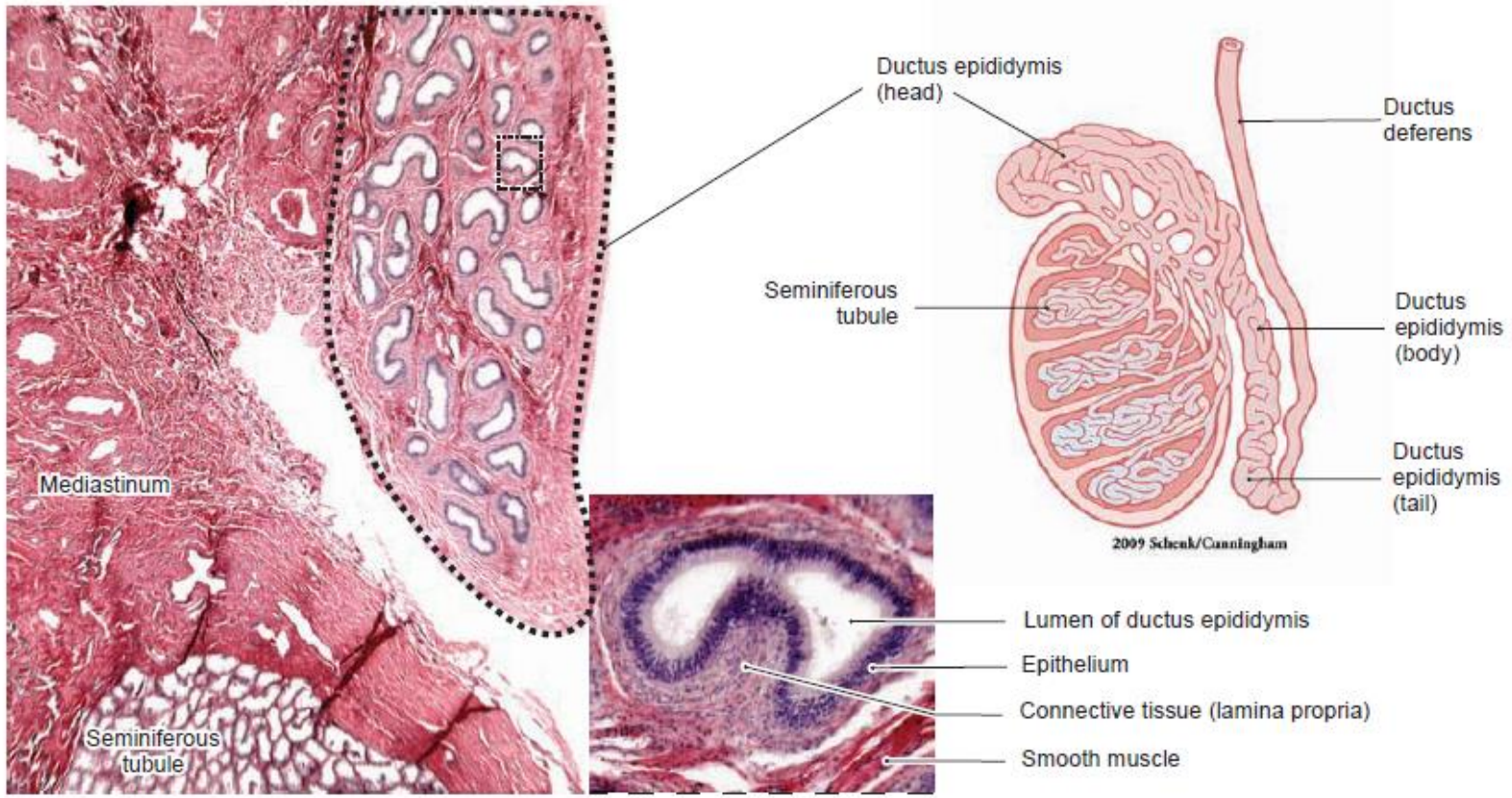
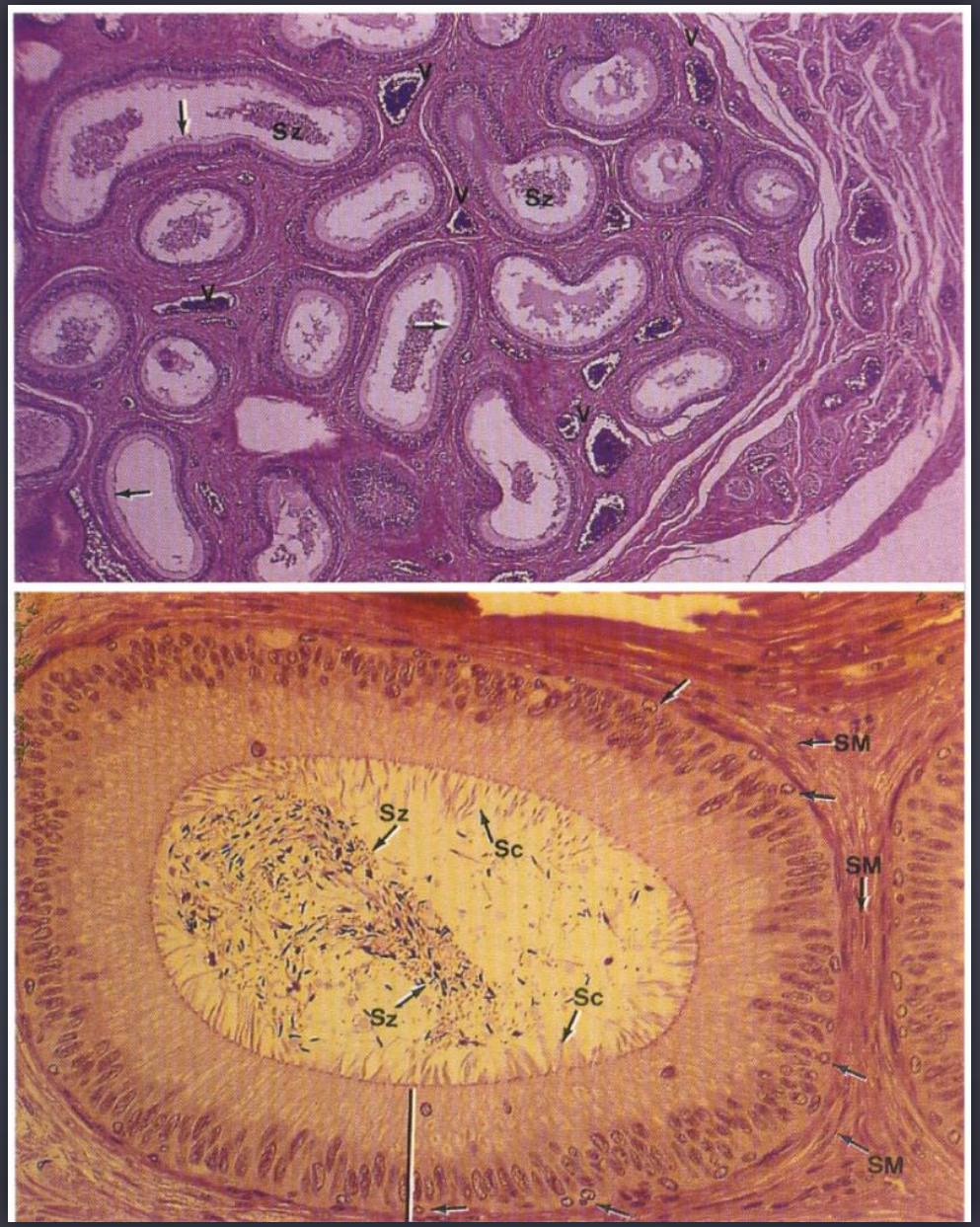


Figure 18-16. Ductus epididymis. H&E, ×11; inset ×75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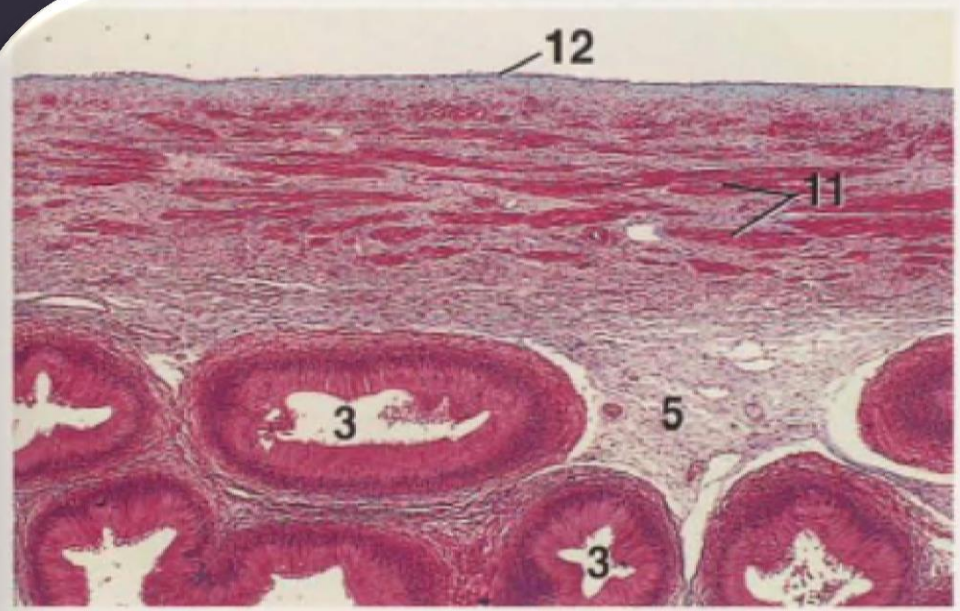


Figure 17.13 ×25

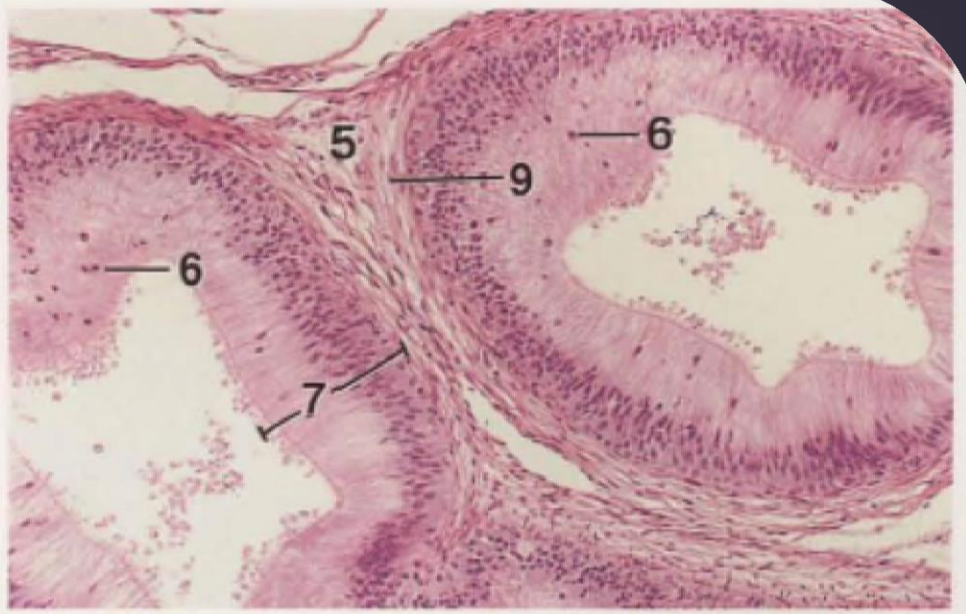


Figure 17.14 ×62.5

KEY	
1. Columnar epithelium	8. Pseudostratified epithelium, efferent ductule
2. Cuboidal epithelium, rete testis	9. Smooth muscle
3. Duct of the epididymis	10. Spermatozoa
4. Efferent ductule	11. Tunica albuginea, smooth muscle
5. Loose connective tissue	12. Tunica vaginalis, mesothelium
6. Lymphocyte, migrating	
7. Pseudostratified epithelium	

Head of Epididymis in Stallion

Figure 17.15 ×62.5

KEY	
1. Basal cell	6. Serosa
2. Lamina propria	7. Smooth muscle
3. Loose connective tissue	8. Spermatozoa
4. Muscularis	9. Stereocilia
5. Pseudostratified epithelium	10. Villus-like projection

Figure 17.15. Body of Epididymis, Stallion. The duct of the epididymis in this region is surrounded by more smooth muscle than in the head of the epididymis, and the pseudostratified columnar epithelium is not as thick as in the head of the epididymis (see Fig.

Body of Epididymis in Stallion

Figure 17.16 ×62.5

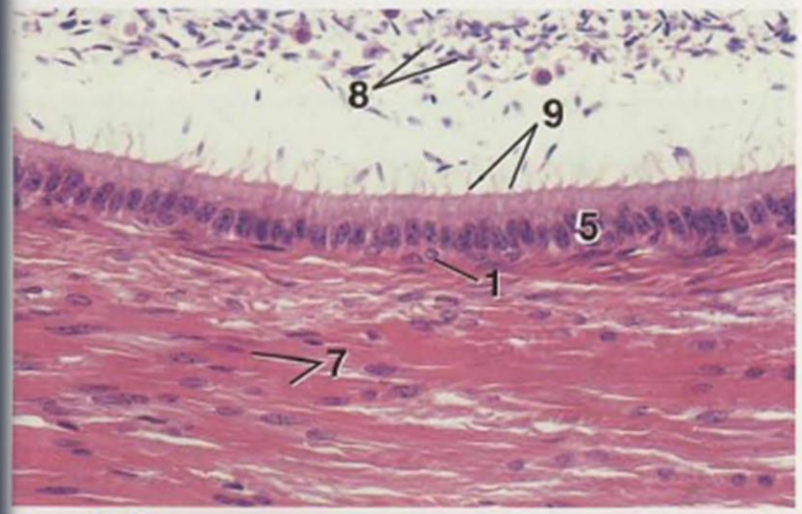


Figure 17.17 ×250

KEY	
1. Basal cell	6. Serosa
2. Lamina propria	7. Smooth muscle
3. Loose connective tissue	8. Spermatozoa
4. Muscularis	9. Stereocilia
5. Pseudostratified epithelium	10. Villus-like projection

Figure 17.16. Tail of Epididymis, Stallion. A low, pseudostratified columnar epithelium and abundant circular smooth muscle characterize the duct of the epididymis in this region. In the stallion the caudal segment of the duct of the epididymis has villuslike projections.

Figure 17.17. Tail of Epididymis, Stallion. Detail of the duct of the epididymis lined by low, pseudostratified columnar epithelium and surrounded by abundant, circular smooth muscle.

Tail of Epididymis in Stallion

Ductus defernes (Vas deferens)

- Pseudostratified columnar epi.
- Lamina propria
- 3 layers of smooth muscle

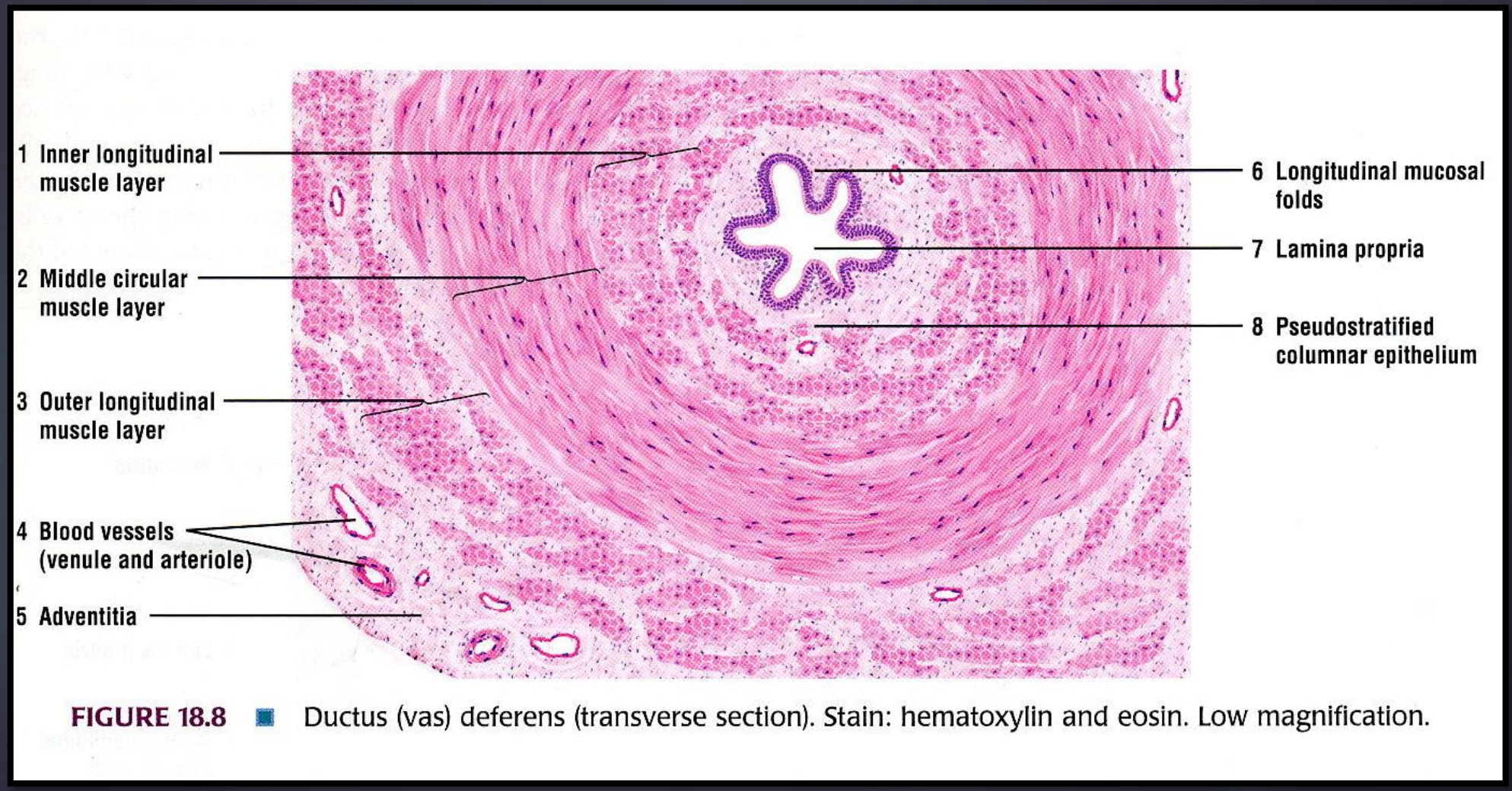
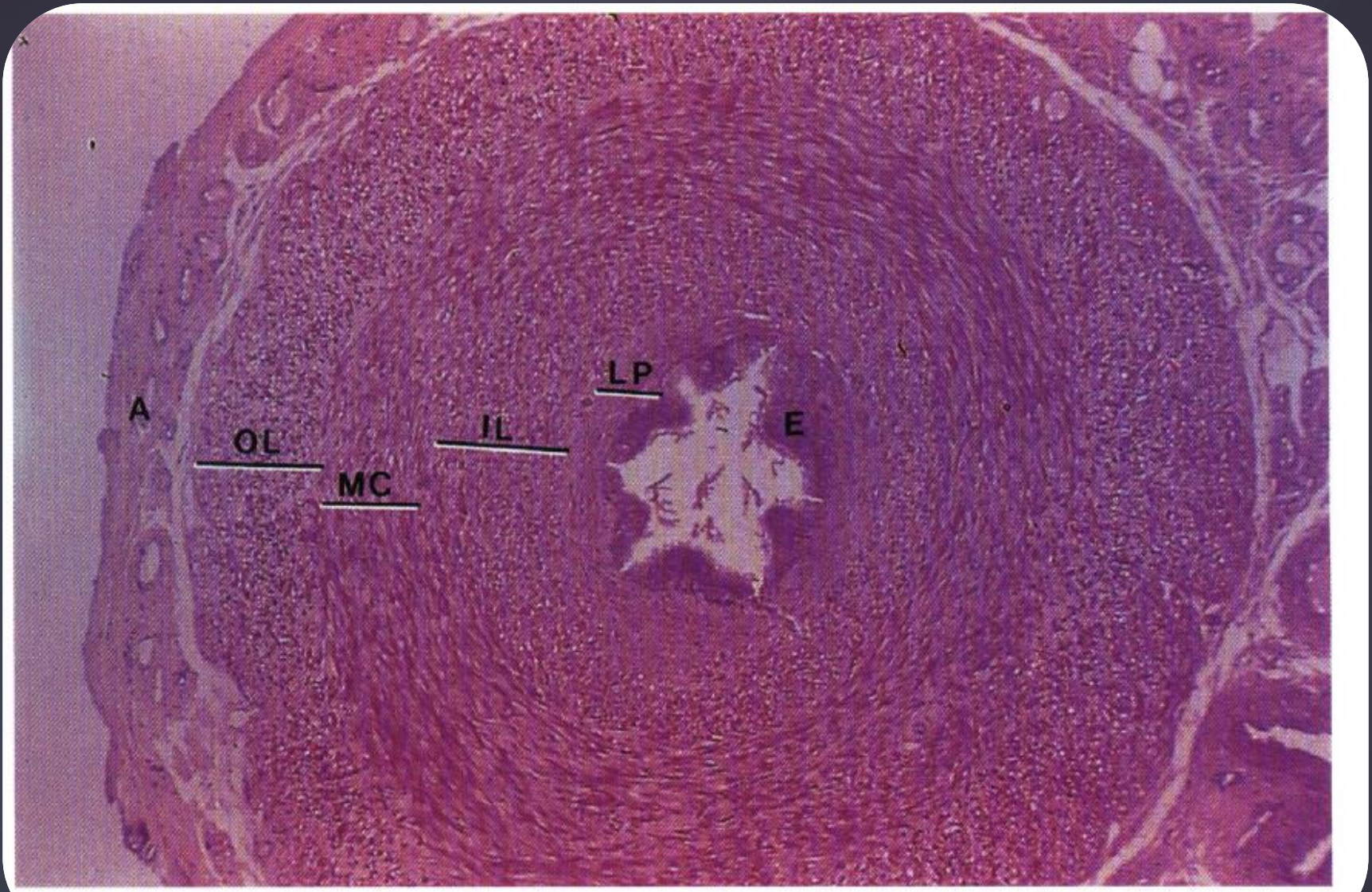


FIGURE 18.8 ■ Ductus (vas) deferens (transverse section). Stain: hematoxylin and eosin. Low magnification.



ure 18-16

Ejaculatory duct , Ampulla

- Pseudostratified columnar epi
- Lamina propria
- Muscular layer only in ampulla

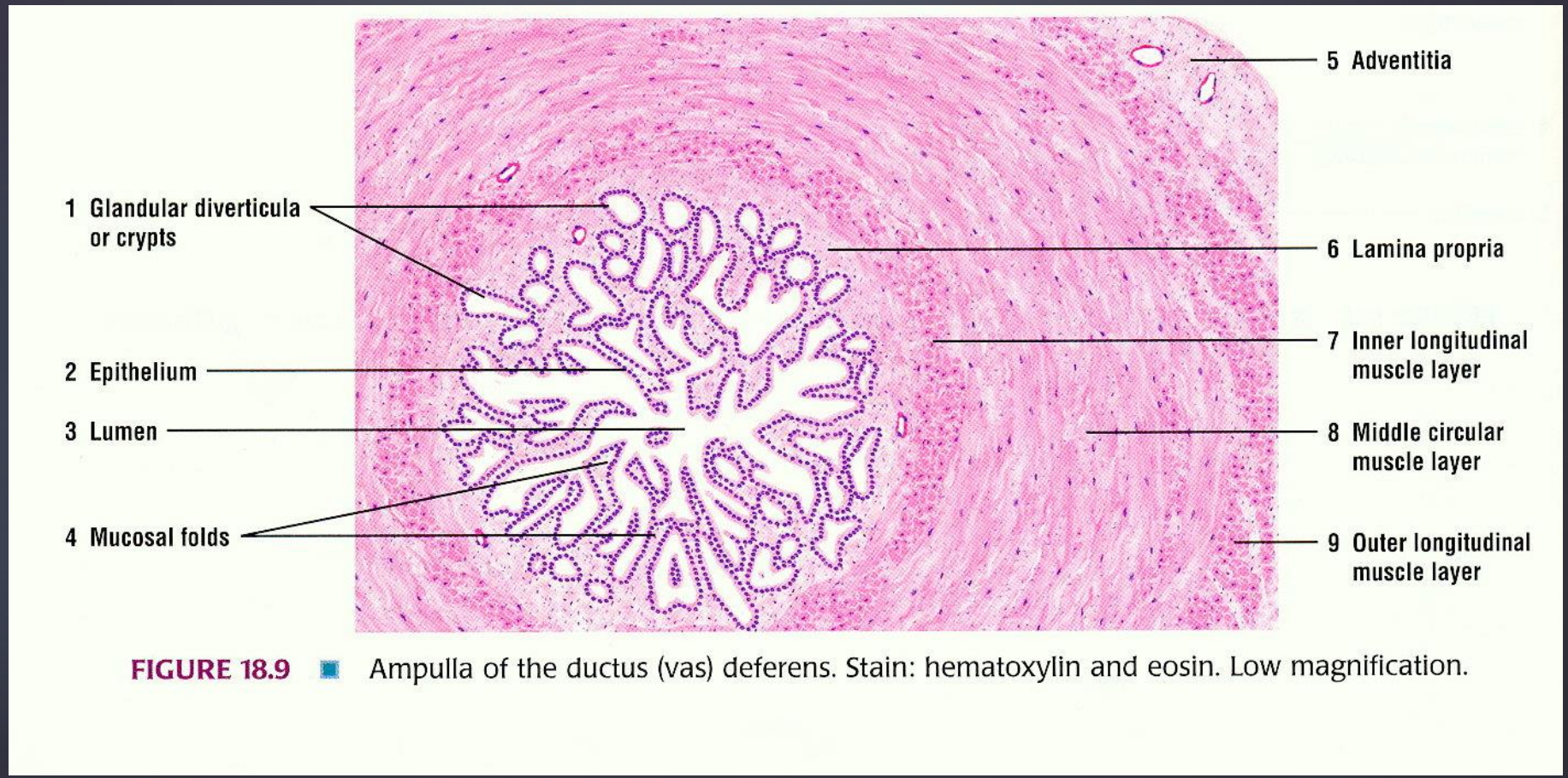


FIGURE 18.9 ■ Ampulla of the ductus (vas) deferens. Stain: hematoxylin and eosin. Low magnification.

Figure 18-19A. **Ejaculatory duct, prostate gland.** H&E, ×11

The ampulla of the ductus deferens continues after it joins with the duct of the seminal vesicle to form the **ejaculatory duct**. The two ejaculatory ducts pass through the prostate gland to join with the urethra. Each ejaculatory duct is a short, straight tube (1–2 cm in length) and has a thin wall lined by **pseudostratified** (or **simple**) **columnar epithelium** and supported by connective tissue. Smooth muscle is present in the initial segment but disappears in most of the ejaculatory ducts. Here is an example of the two ejaculatory ducts within the prostate gland, surrounded by large amounts of connective tissue. The mucosa forms many folds extending into the lumen. The lumen may contain **prostatic concretions** (secretory material of the prostatic gland and often seen in older male patients).

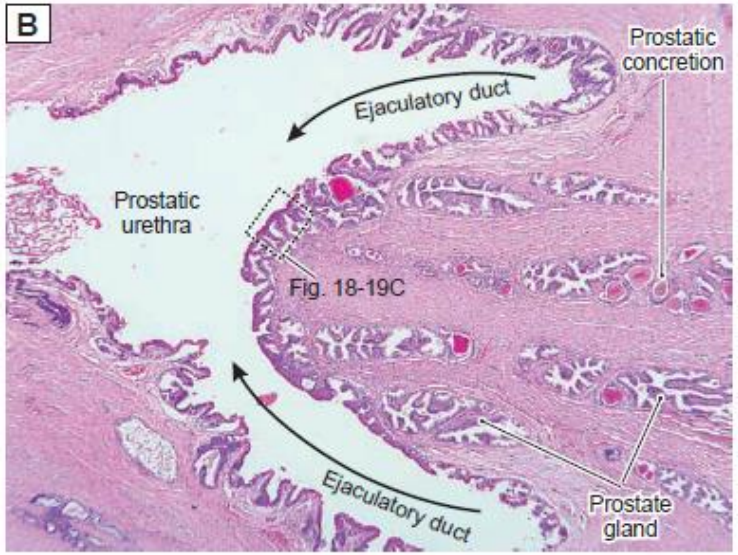


Figure 18-19B. **Ejaculatory duct, prostate gland.** H&E, ×34

The **ejaculatory ducts** penetrate the prostate gland and open into the **prostatic urethra**, at the **seminal colliculus** (also called the **verumontanum**), on the posterior wall of the prostatic urethra. This portion of the urethra has thick mucosa and shallow folds as shown here. The function of the ejaculatory ducts is to transport spermatozoa and seminal fluid into the prostatic urethra. The urethra includes three parts: the **prostatic urethra** (proximal part, near the bladder), the **membranous urethra** (intermediate part), and the **penile (spongy) urethra** (distal part). Prostatic concretions, also called **corpora amylacea**, are present in the lumen of the prostate gland shown here (Fig. 18-20B).

Seminal vesicles

- cuboidela-to-pseudostratified epi
- folded mucosa
- smooth muscle layer (C+L)
- adventitia + serosa on apex !
- function: 50-70% of seminal fluid
  - fructose

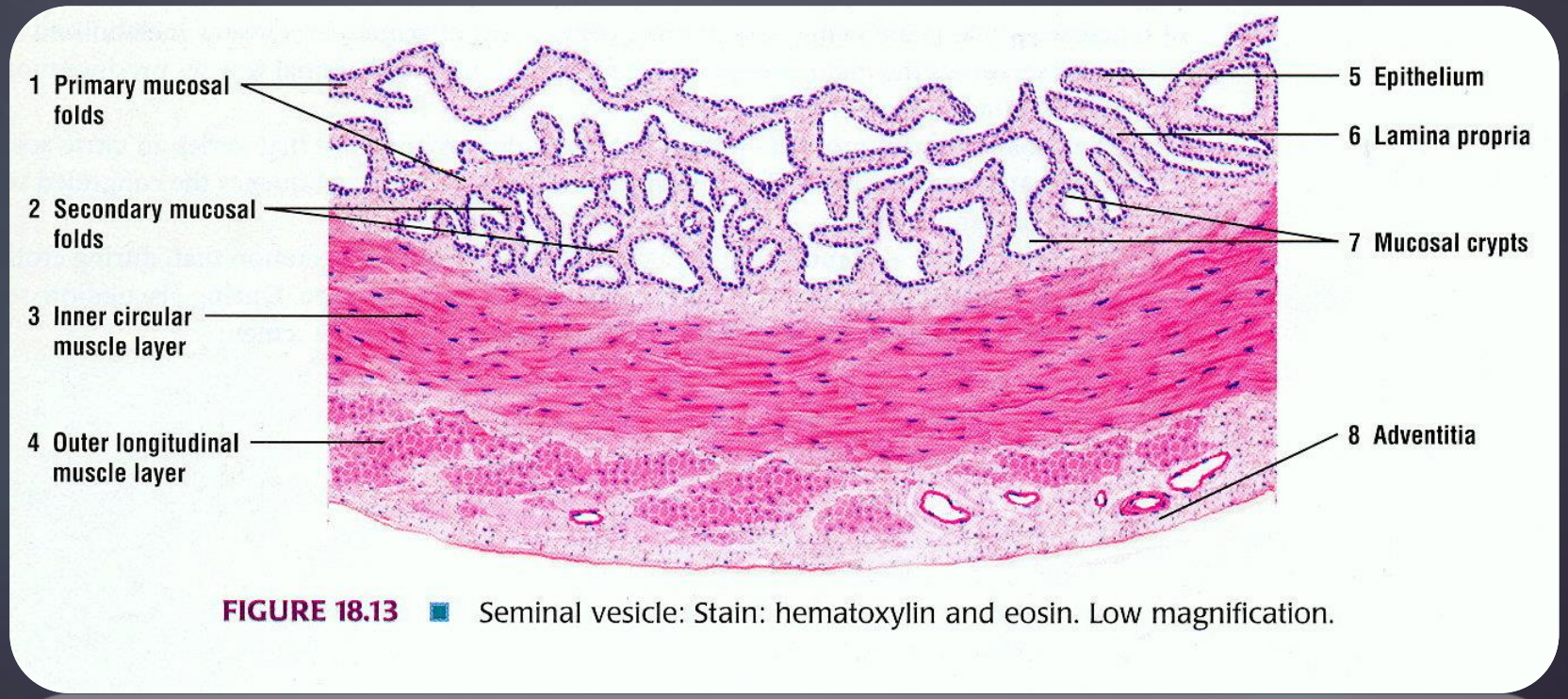
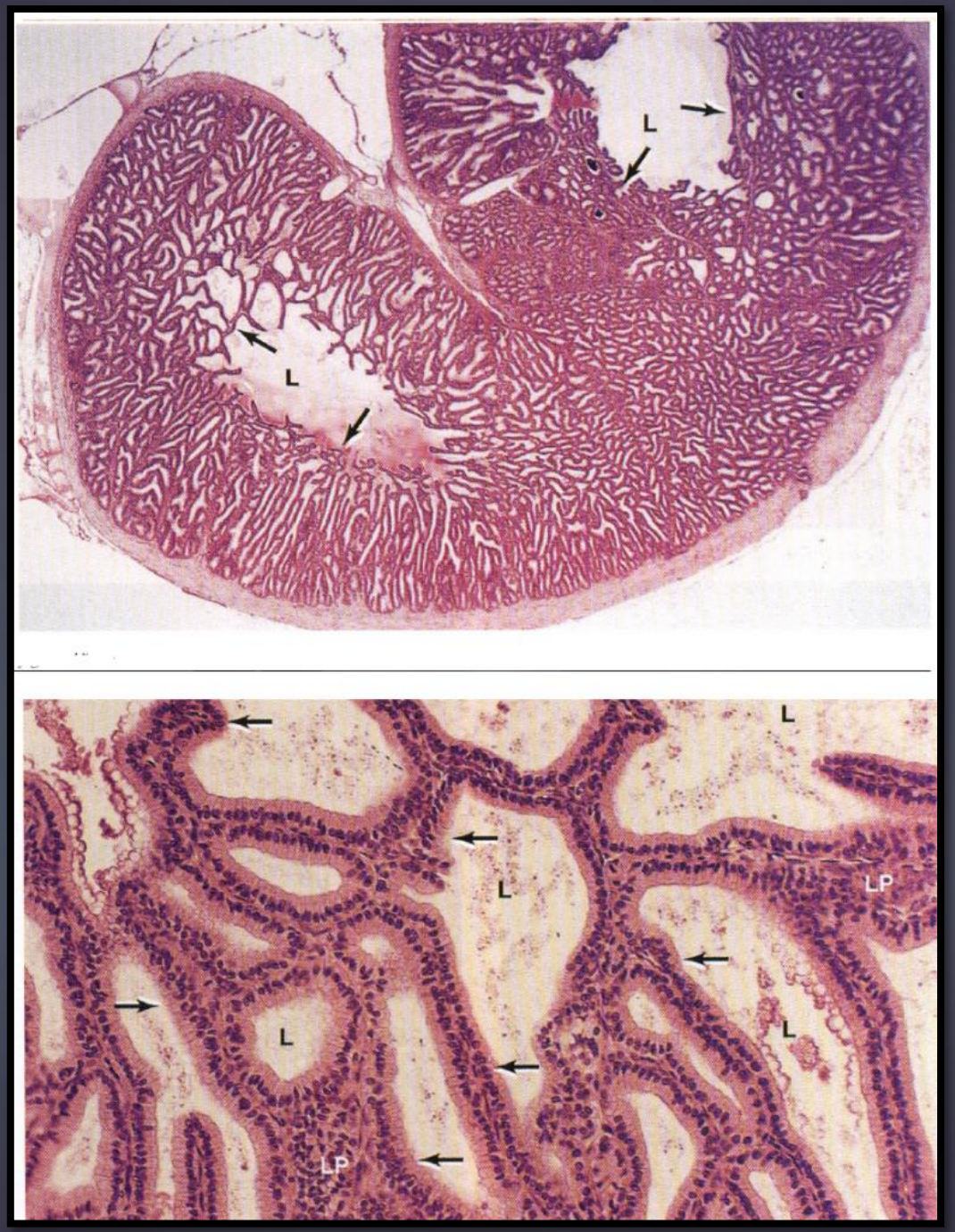


FIGURE 18.13 ■ Seminal vesicle: Stain: hematoxylin and eosin. Low magnification.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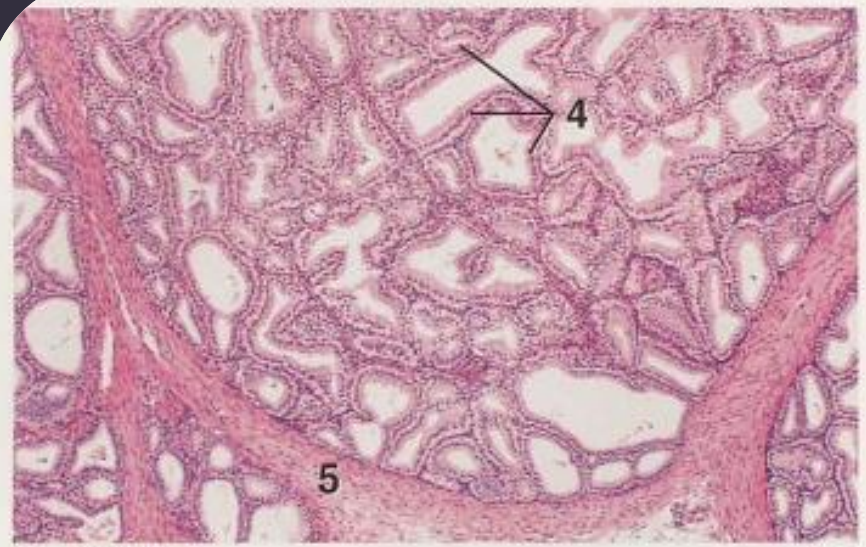


Figure 17.25 ×25

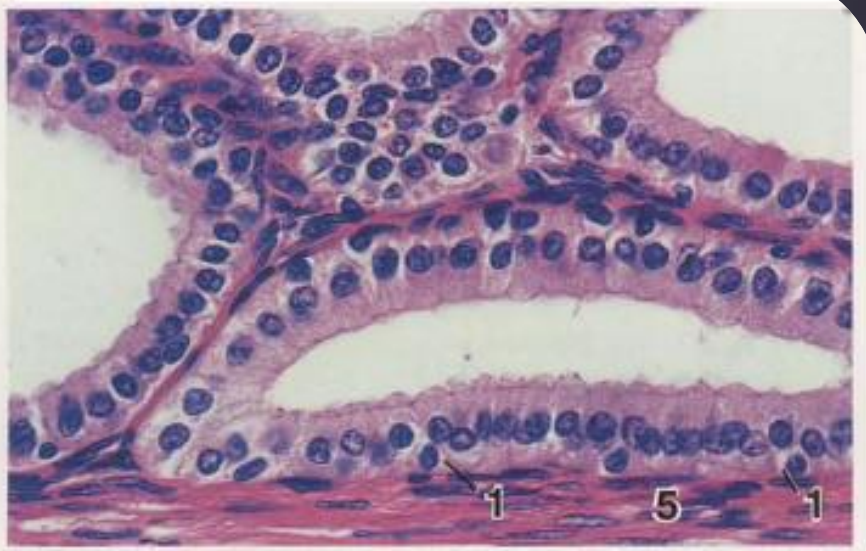


Figure 17.26 ×250

KEY	
1. Basal cell	7. Pseudostratified epithelium
2. Capsule	8. Secretion
3. Duct	9. Stratum cavernosum
4. Gland	10. Trabecula
5. Interlobular septum	11. Transitional epithelium
6. Prostate gland	12. Urethra, lumen

Figure 17.25. Seminal Vesicle, Ram. Lobules of tubuloalveolar glands are divided by interlobular septa, which contain an abundance of smooth muscle in ruminants. In the stallion and boar the septa consist predominantly of connective tissue with some smooth muscle. Seminal vesicles are absent in carnivores.

Figure 17.26. Seminal Vesicle, Ram. The pseudostratified glandular epithelium is characterized by sparse basal cells. Note the muscular septum.

Prostate

- simple-to-pseudostratified epi
- prostatic concrements (corpora amylacea)
  - protein rich material, calcifications
- function: enrich the semen fluid, fibrinolysin, amylase, PSA

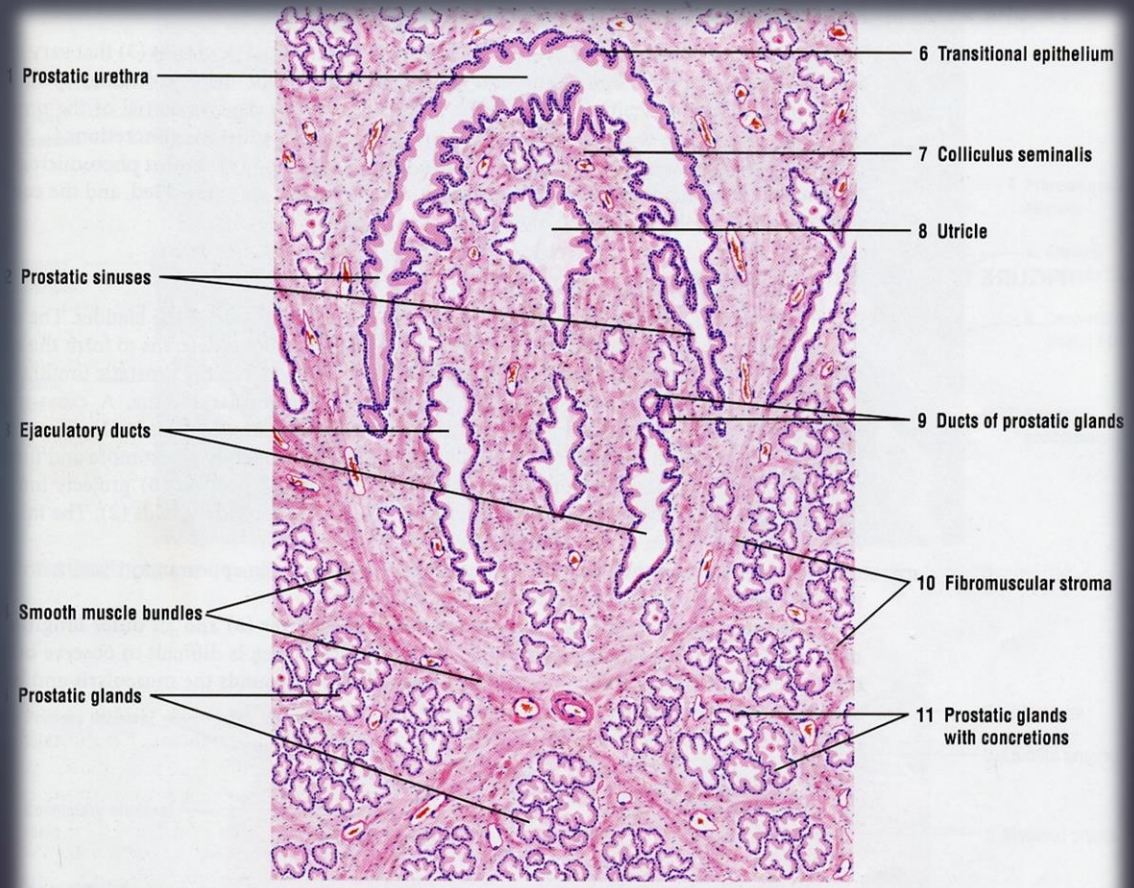


FIGURE 18.10 ■ Prostate gland and prostatic urethra. Stain: hematoxylin and eosin. Low magnification.

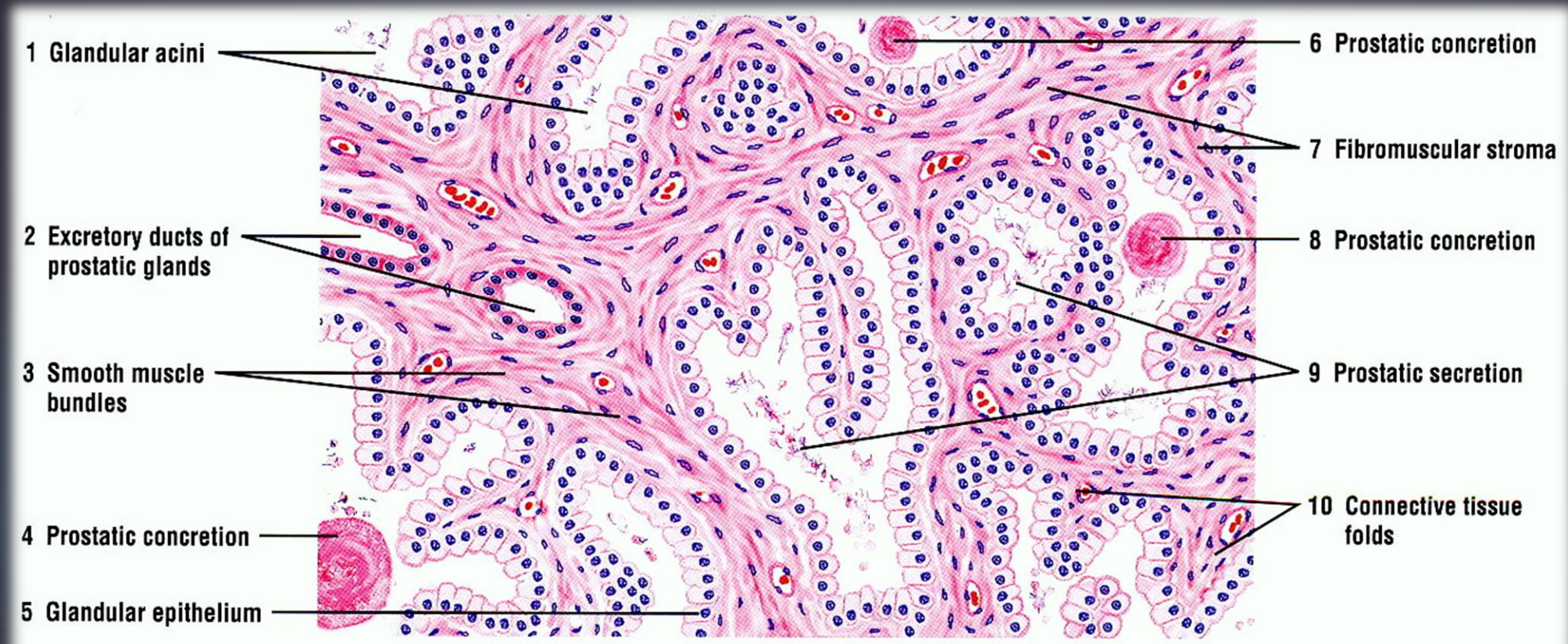


FIGURE 18.11 ■ Prostate gland: glandular acini and prostatic concretions. Stain: hematoxylin and eosin. Medium magnification.

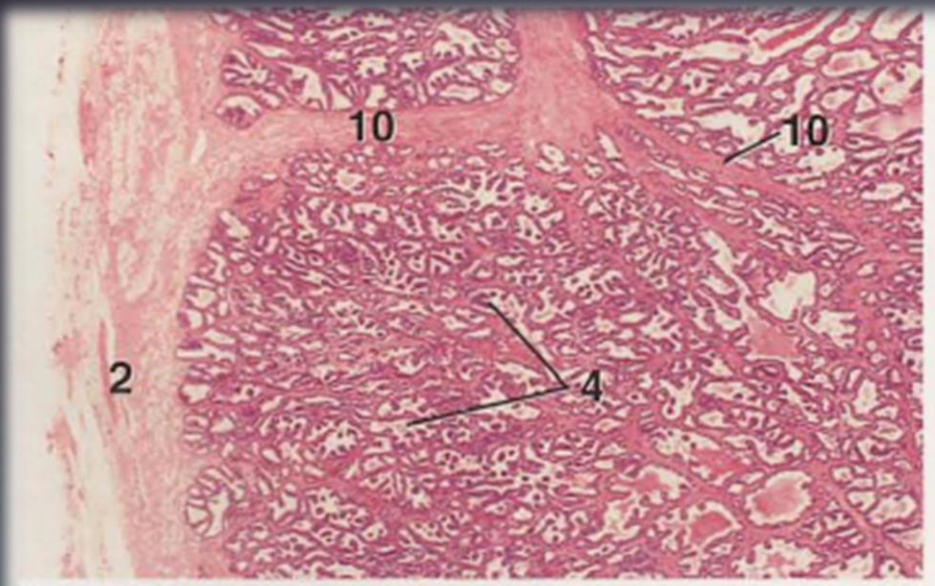


Figure 17.27 ×12.5

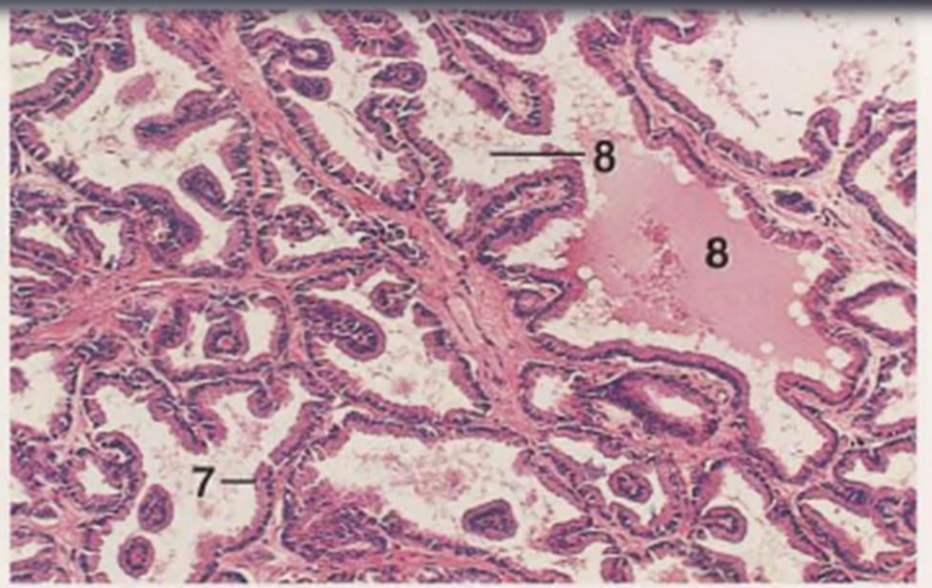
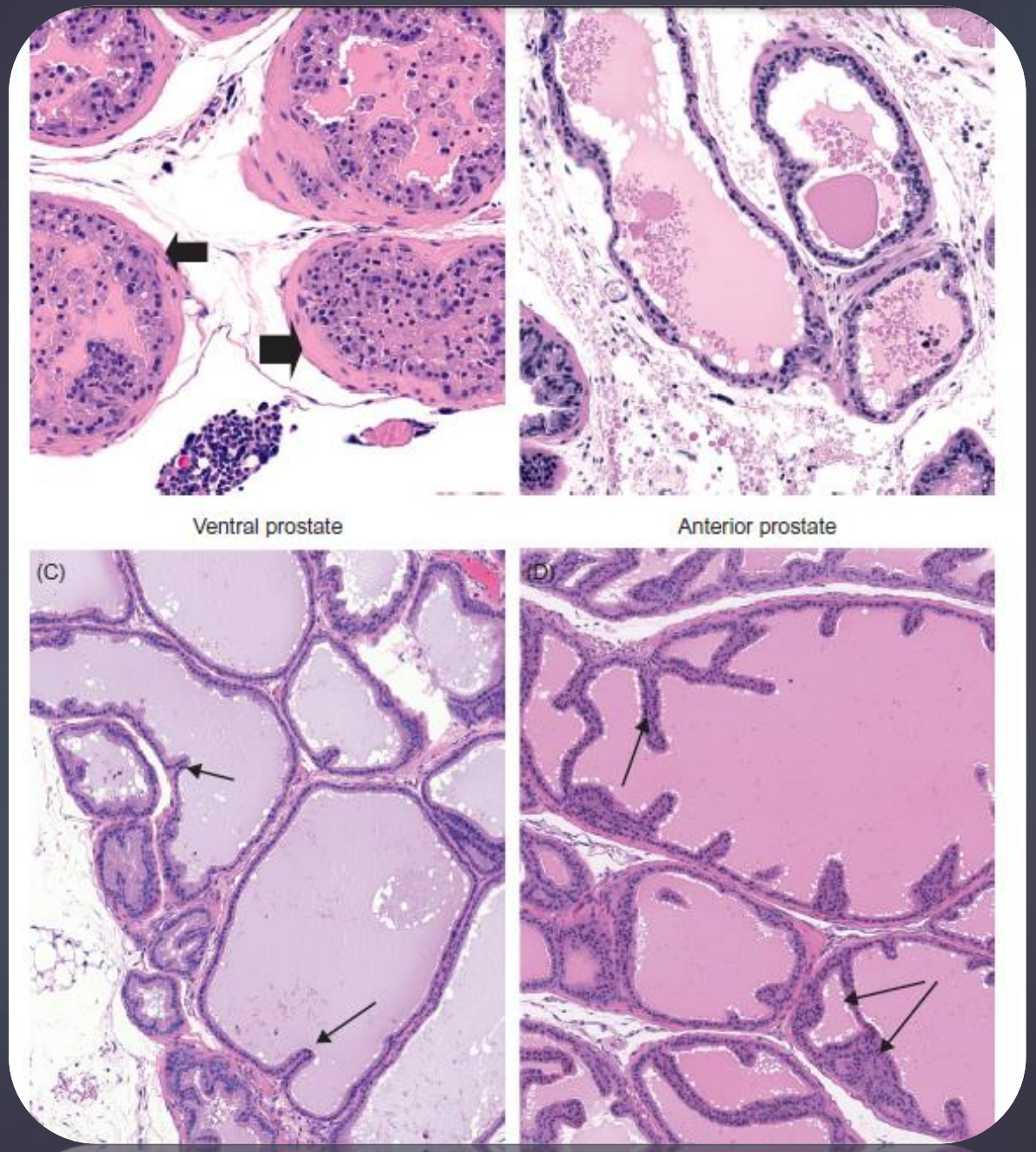


Figure 17.28 ×62.5

Figure 17.27. Body of the Prostate, Dog. The body of the prostate, which is well developed in carnivores and the stallion, is surrounded by a capsule of dense connective tissue and smooth muscle. Trabeculae from the capsule divide the gland into lobules.

Figure 17.28. Body of the Prostate, Dog. In the dog, this is a serous gland. Compare with Figure 17.31.

KEY	
1. Basal cell	7. Pseudostratified epithelium
2. Capsule	8. Secretion
3. Duct	9. Stratum cavernosum
4. Gland	10. Trabecula
5. Interlobular septum	11. Transitional epithelium
6. Prostate gland	12. Urethra, lumen


Ventral prostate
Anterior prostate
(C)
(D)

Bulbourethral glands

- mucus secreting glands
- +galactose
- lubrication function

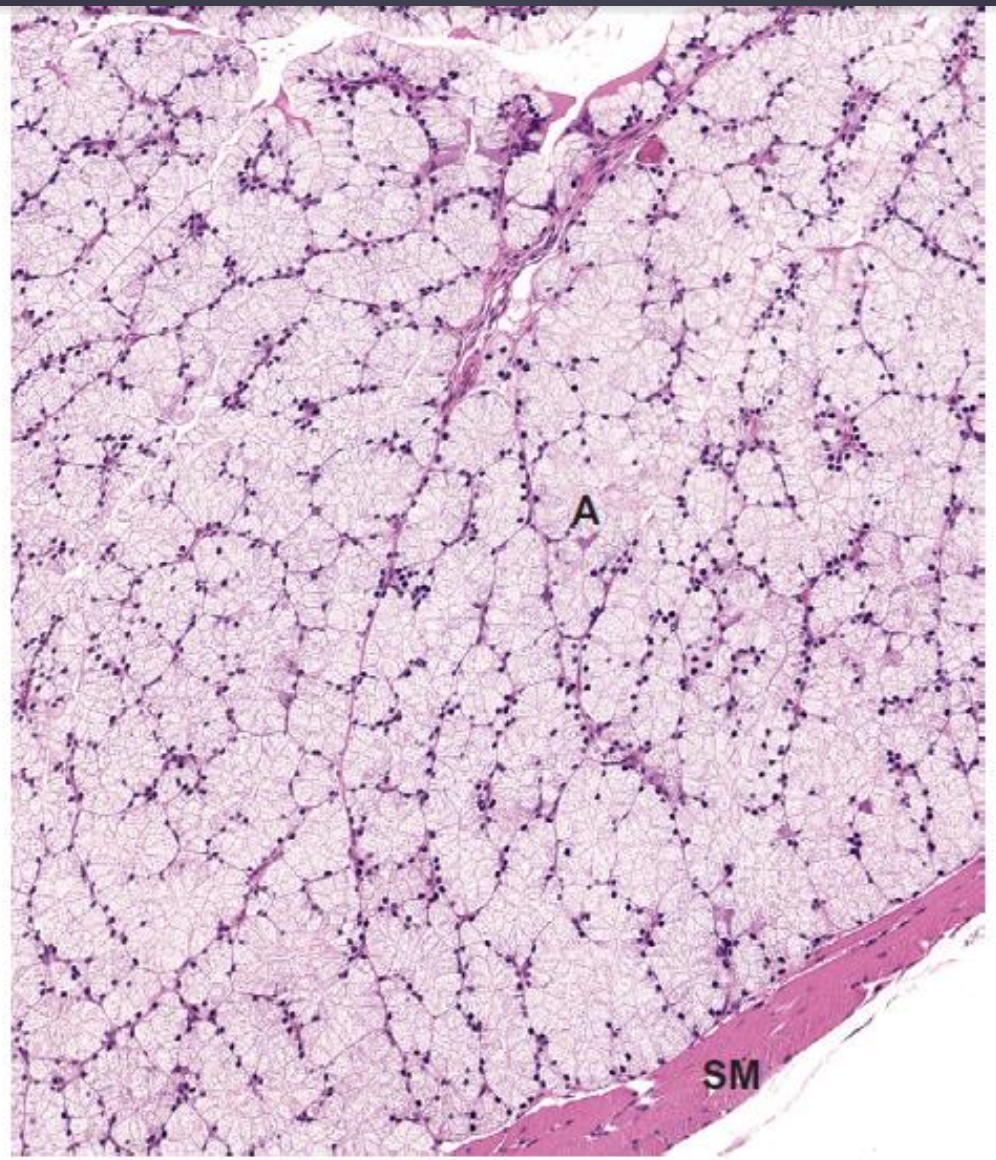
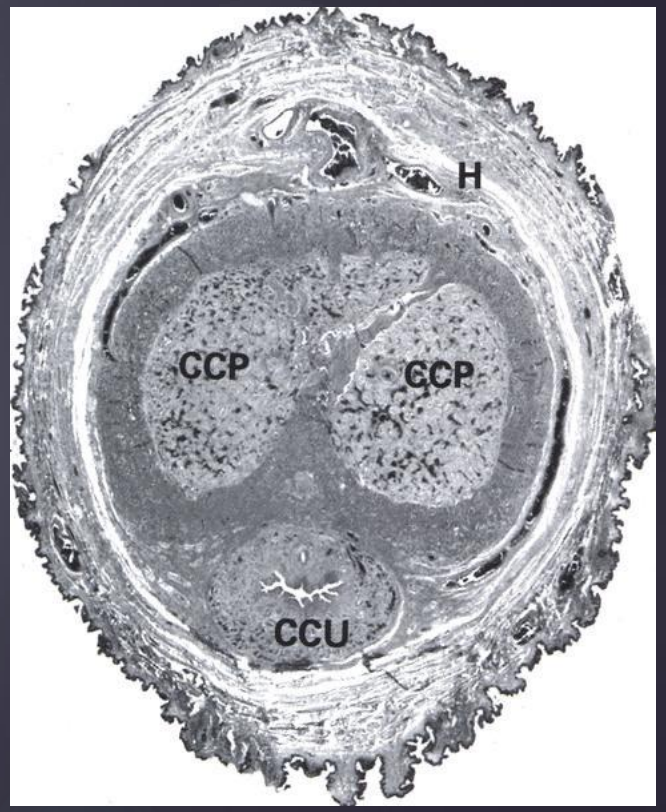


FIGURE 32 Mouse bulbourethral gland. The bulbourethral gland (Cowper's gland) consists of acini (A) lined by tall columnar epithelium with eosinophilic, foamy cytoplasm (secretory state) and skeletal muscle (SM).

Penis

- three masses of erectil tissue
  - 2x corpora cavernosa
  - 1x corpus spongiosum
- communicating blood spaces (sinuses) surrounded by connective tissue
- artery -> sinus -> vein
- dilatation of artery (NO) compress vein, sinuses fill with blood -> erection occurs



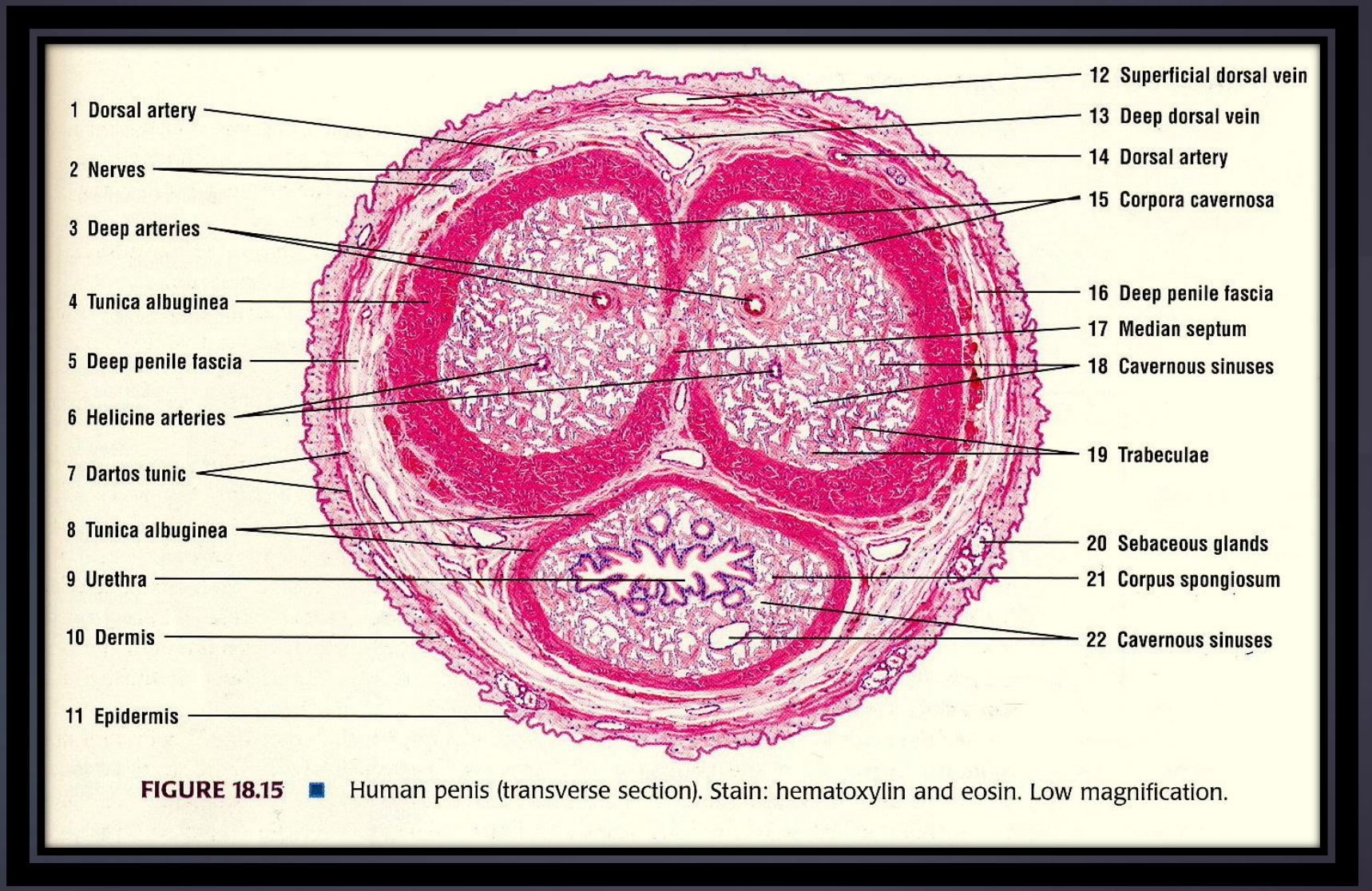


FIGURE 18.15 ■ Human penis (transverse section). Stain: hematoxylin and eosin. Low magnification.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