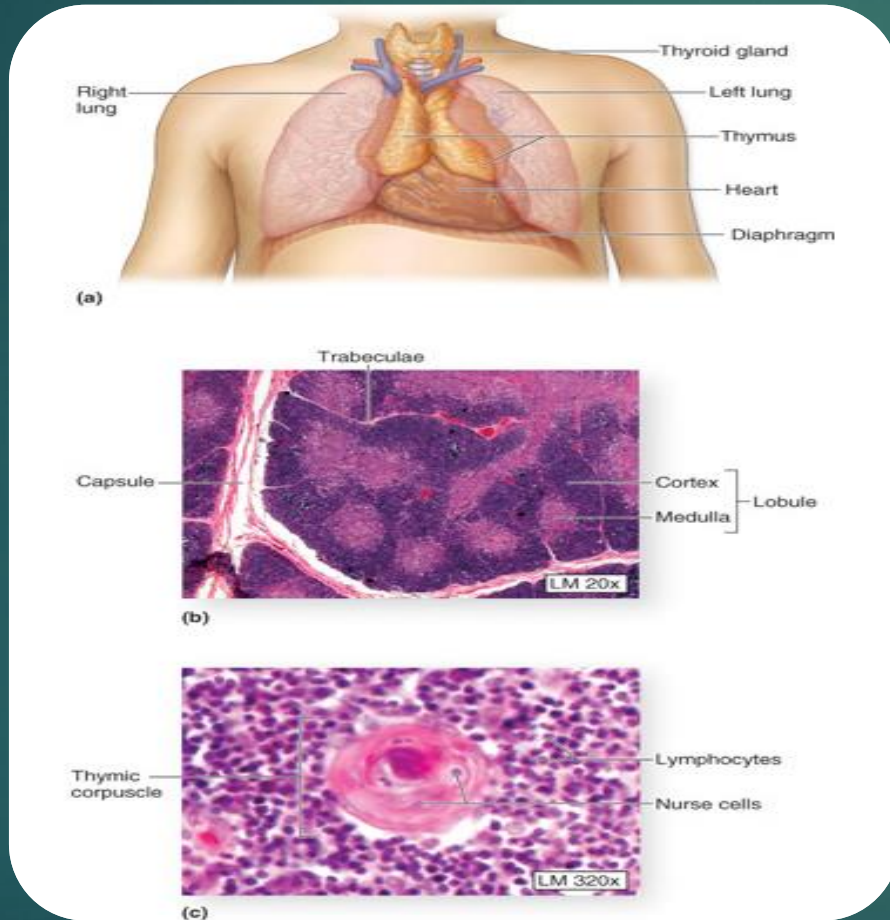


In the name of God



Lymphatic tissue

Lymph Tissue

▶ 3 types

▶ Diffuse lymphatic tissue

- ▶ No capsule present
- ▶ Found in connective tissue of almost all organs

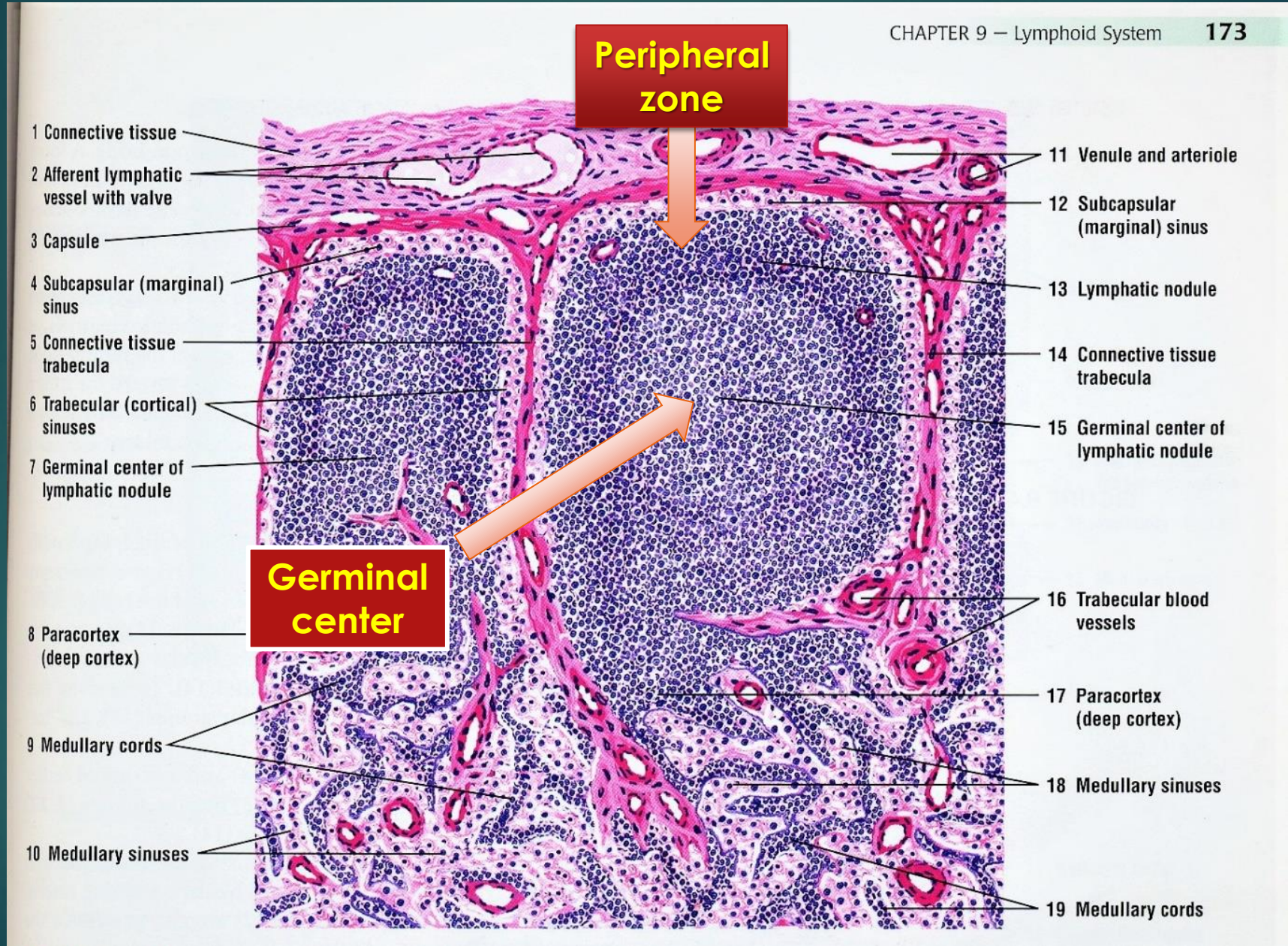
▶ Dense lymphatic tissue

- ▶ No capsule present
- ▶ Oval-shaped masses
- ▶ Found singly or in clusters
- ▶ Tonsils , Peyer's patches , Appendix

▶ Capsulated lymphatic organs

- ▶ Capsule present
- ▶ Lymph and hemal nodes, spleen, thymus gland

Lymph Nodes



Tonsils

Multiple groups of large lymphatic nodules
Location – mucous membrane of the oral and pharyngeal cavities

Palatine tonsils

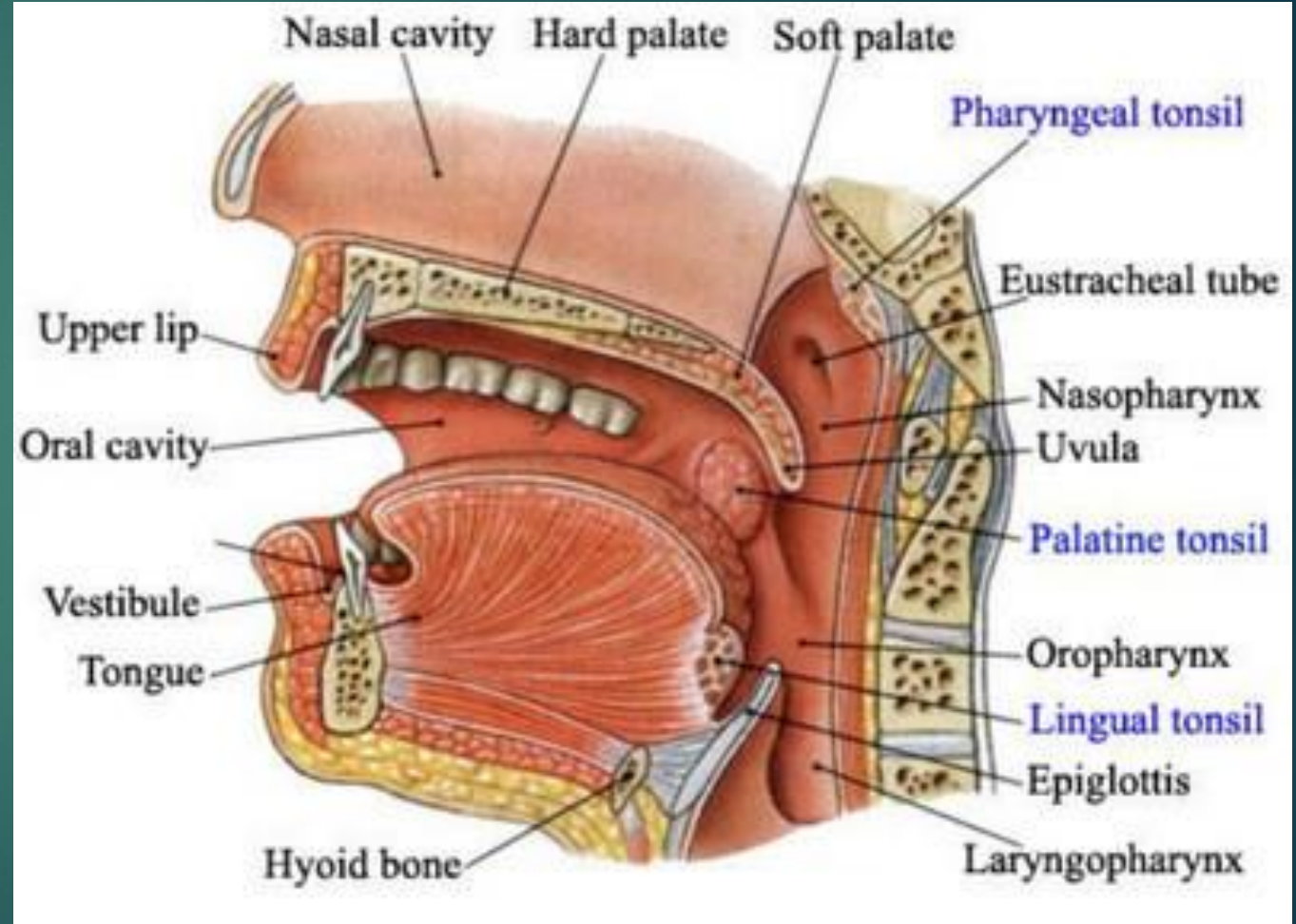
Posterior-lateral walls of the oropharynx

Pharyngeal tonsil

Posterior wall of nasopharynx

Lingual tonsils

Base of tongue



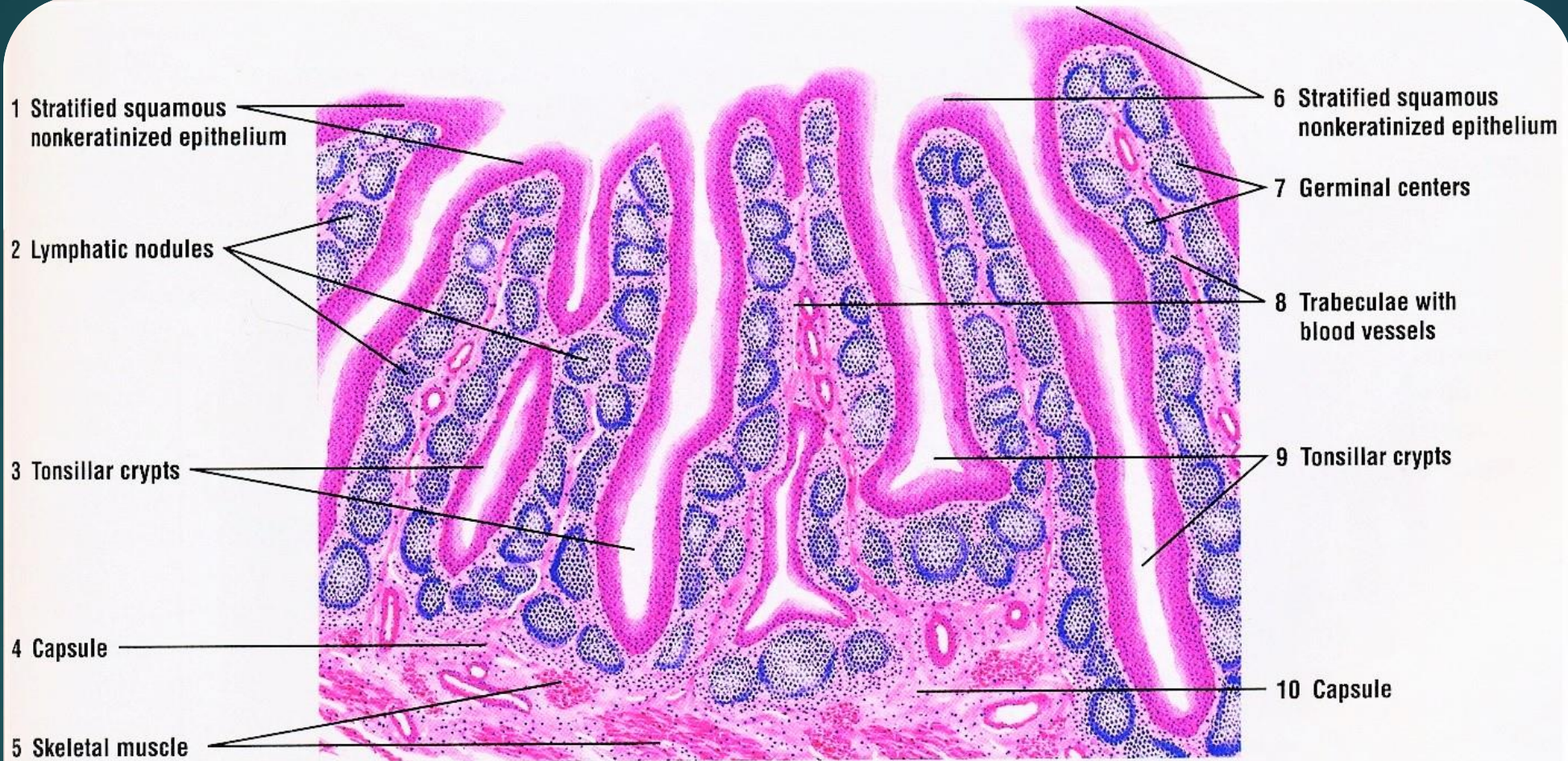


FIGURE 9.12 ■ Palatine tonsil. Stain: hematoxylin and eosin. Low magnification.

FIGURE 9.12 ■ Palatine tonsil. Stain: hematoxylin and eosin. Low magnification.

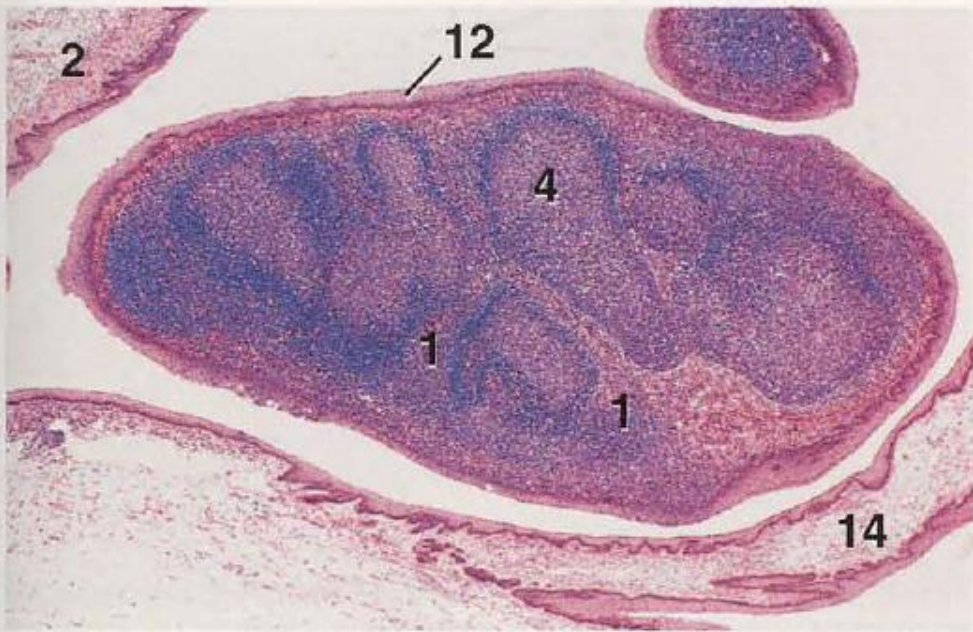


Figure 11.7

×12.5

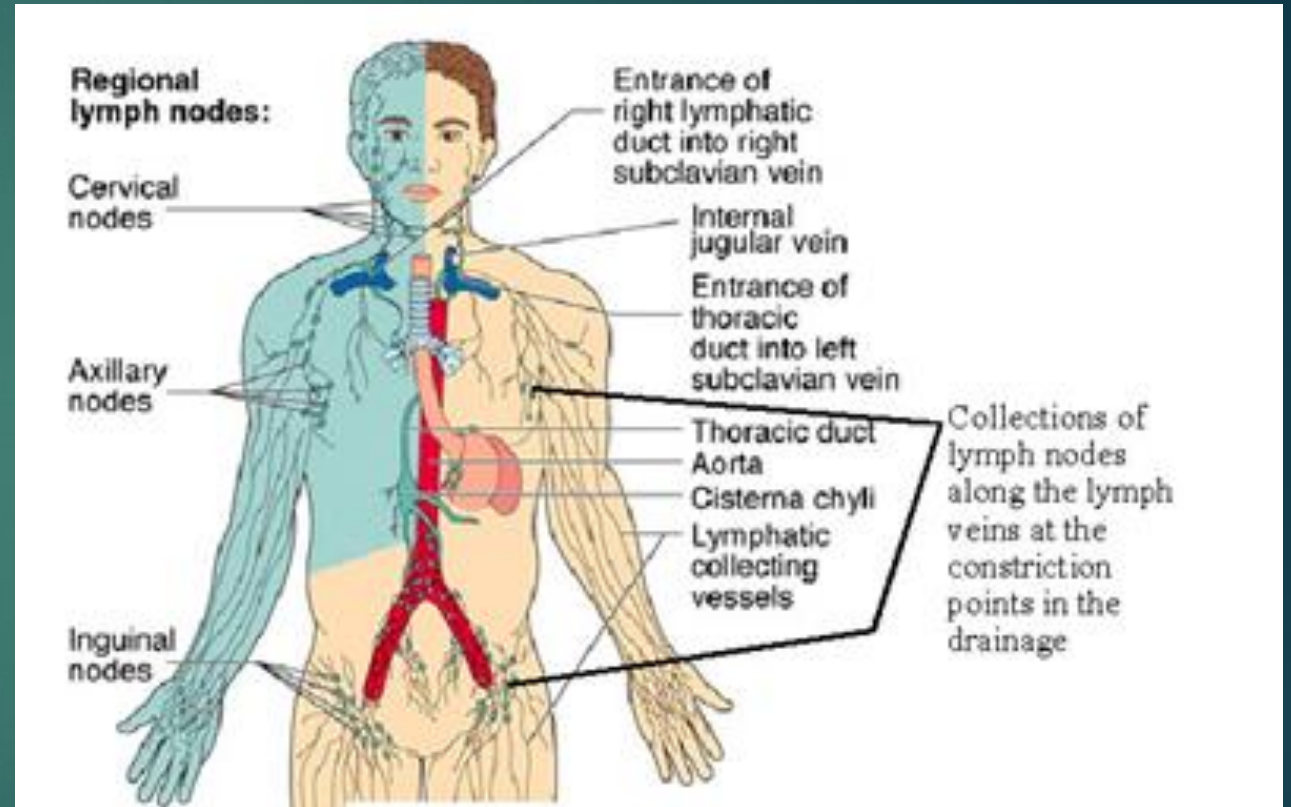
KEY

- | | |
|-----------------------------|--|
| 1. Diffuse lymphatic tissue | 10. Skeletal muscle |
| 2. Epiglottis | 11. Stratified squamous epithelium, semilunar fold |
| 3. Fossa | 12. Stratified squamous epithelium, tonsil |
| 4. Lymphatic nodule | 13. Submucosa |
| 5. Mucous acinus | 14. Vestibular fold |
| 6. Muscularis externa | 15. Villus |
| 7. Salivary glands | |
| 8. Serous acinus | |
| 9. Serous demilune | |

Figure 11.7. Paraepiglottic Tonsil, Larynx, l.s., Cat. In the cat an accumulation of lymphatic tissue in the lateral wall of the larynx, between the epiglottis and the vestibular fold, forms a tonsil without crypts.

Lymph nodes

- Oval structures located along lymphatics
- Enclosed by a fibrous capsule
- Cortex = outer portion
 - Germinal centers produce lymphocytes
- Medulla = inner portion
 - Medullary cords
- Lymph enters nodes through afferent lymphatics, flows through sinuses, exits through efferent lymphatic



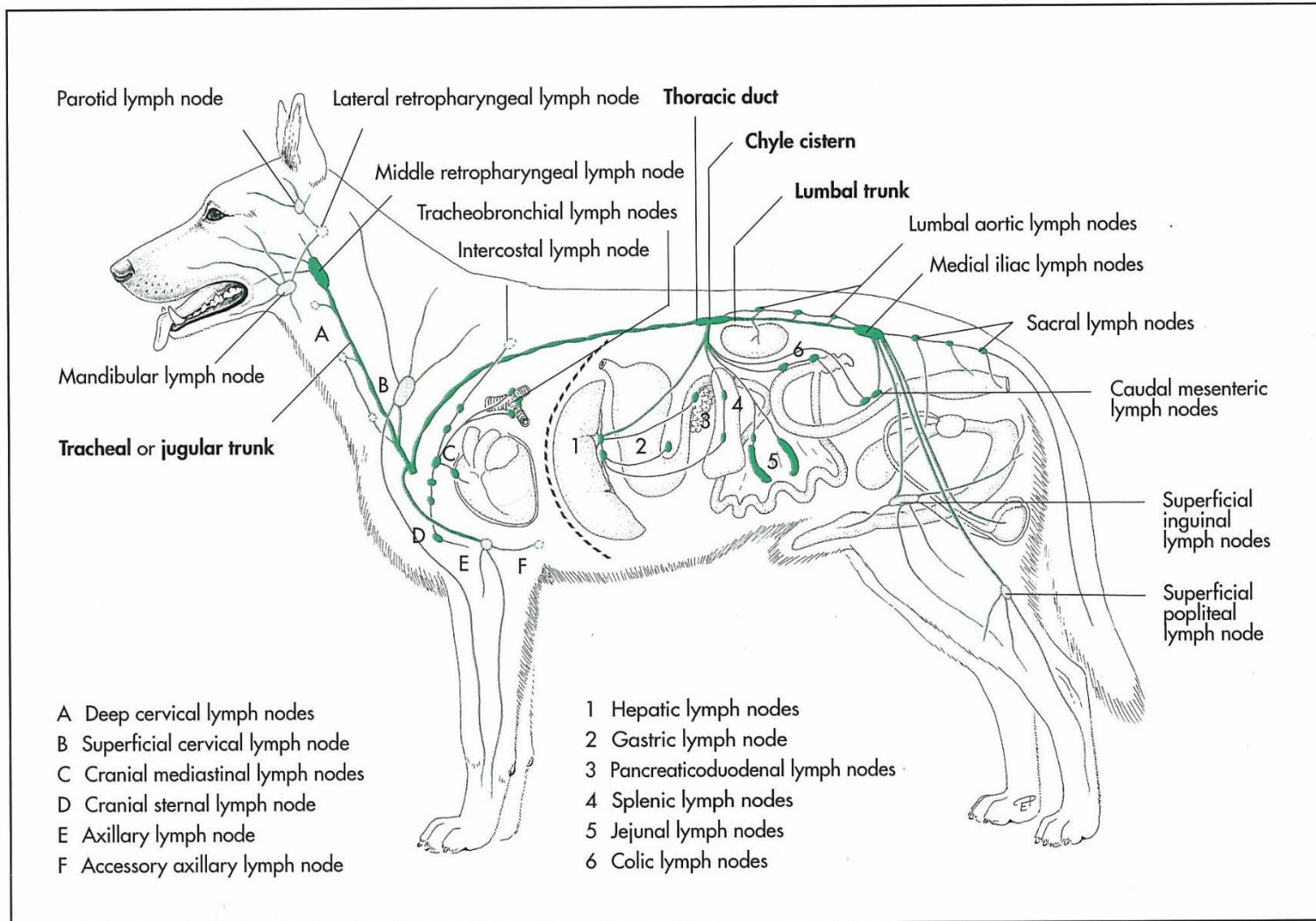
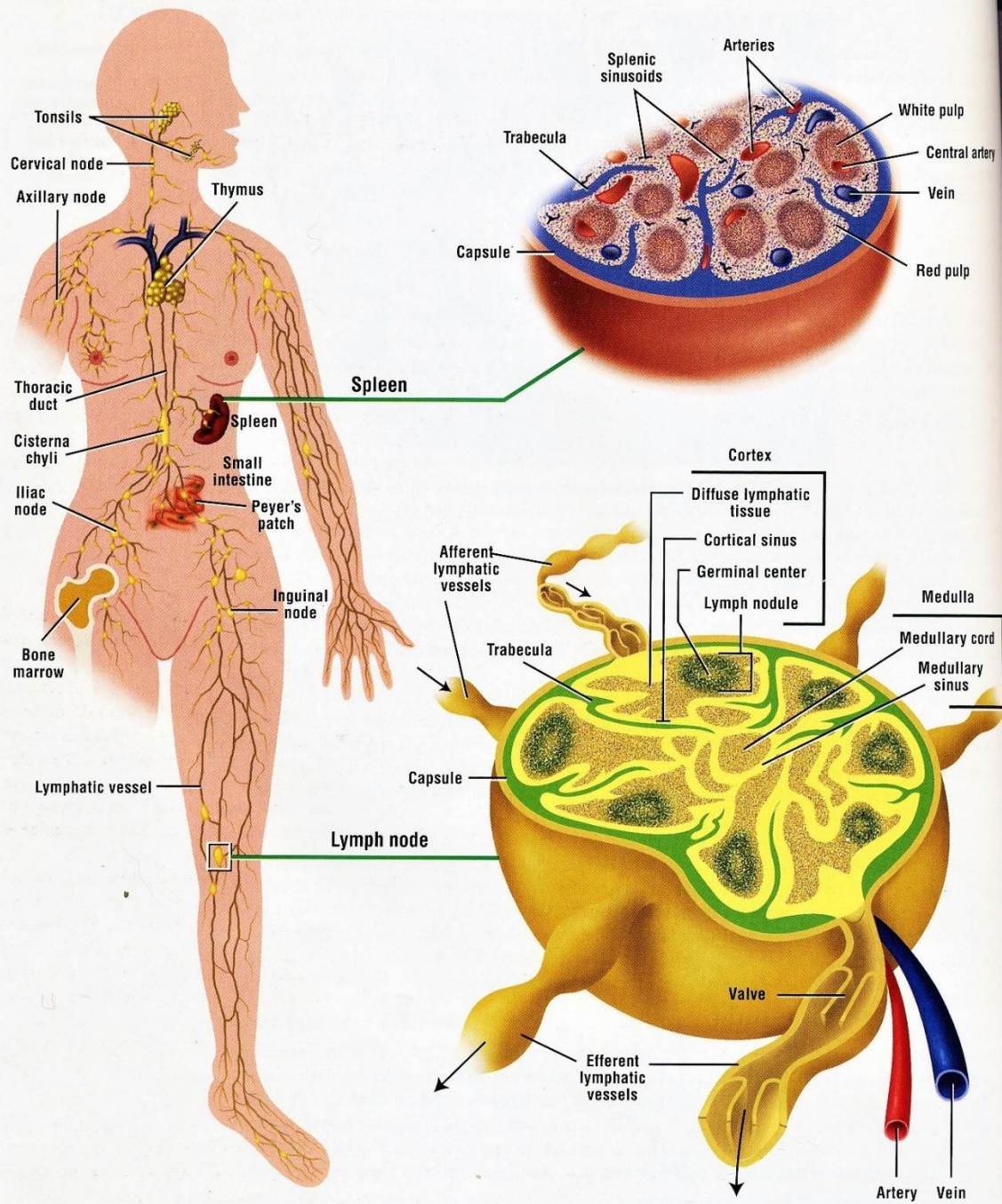


Fig. 13-12. Lymphatic system of the dog, schematic (Budras, Fricke and Richter, 1996).



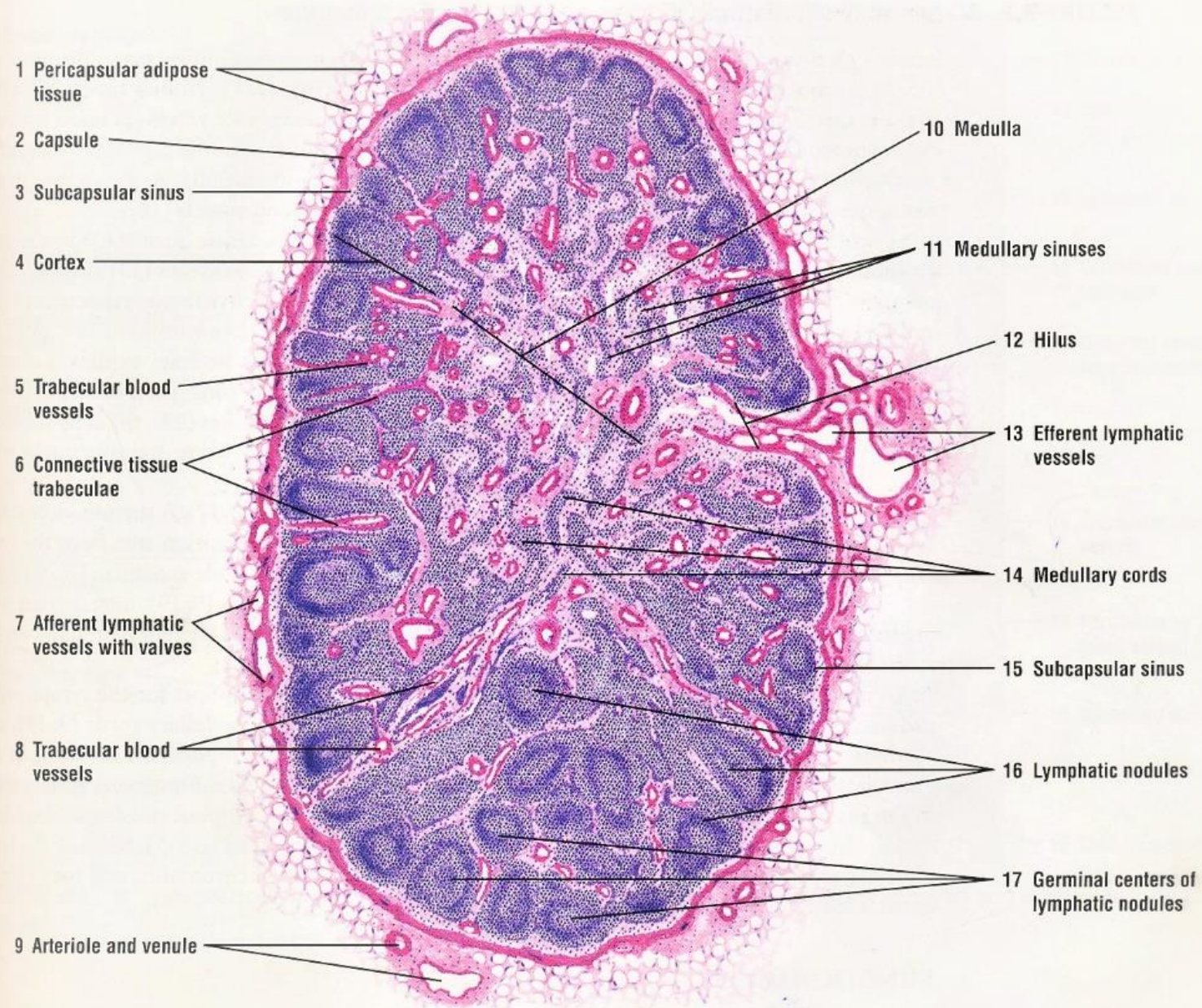
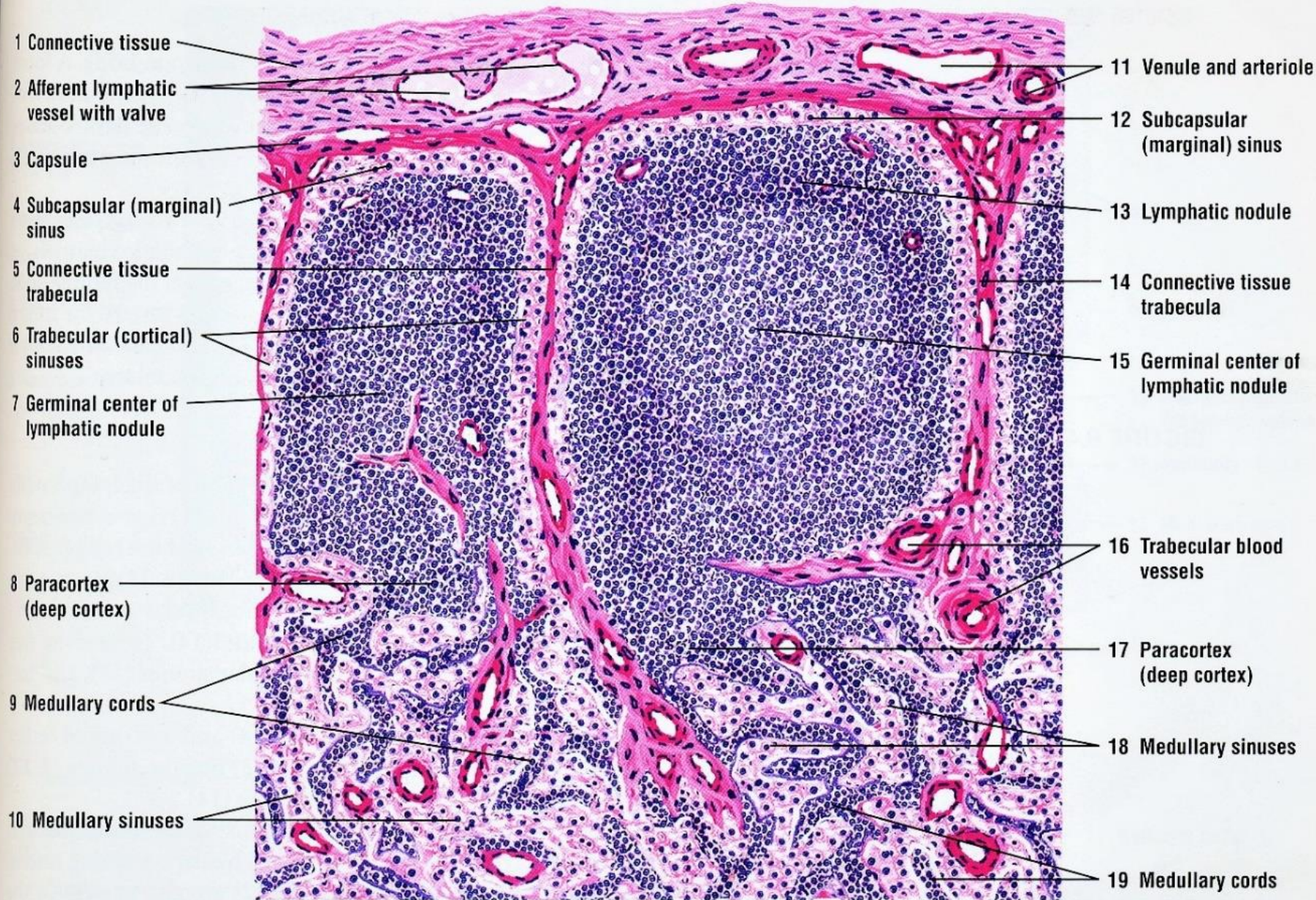


FIGURE 9.1 ■ Lymph node (panoramic view). Stain: hematoxylin and eosin. Medium magnification.



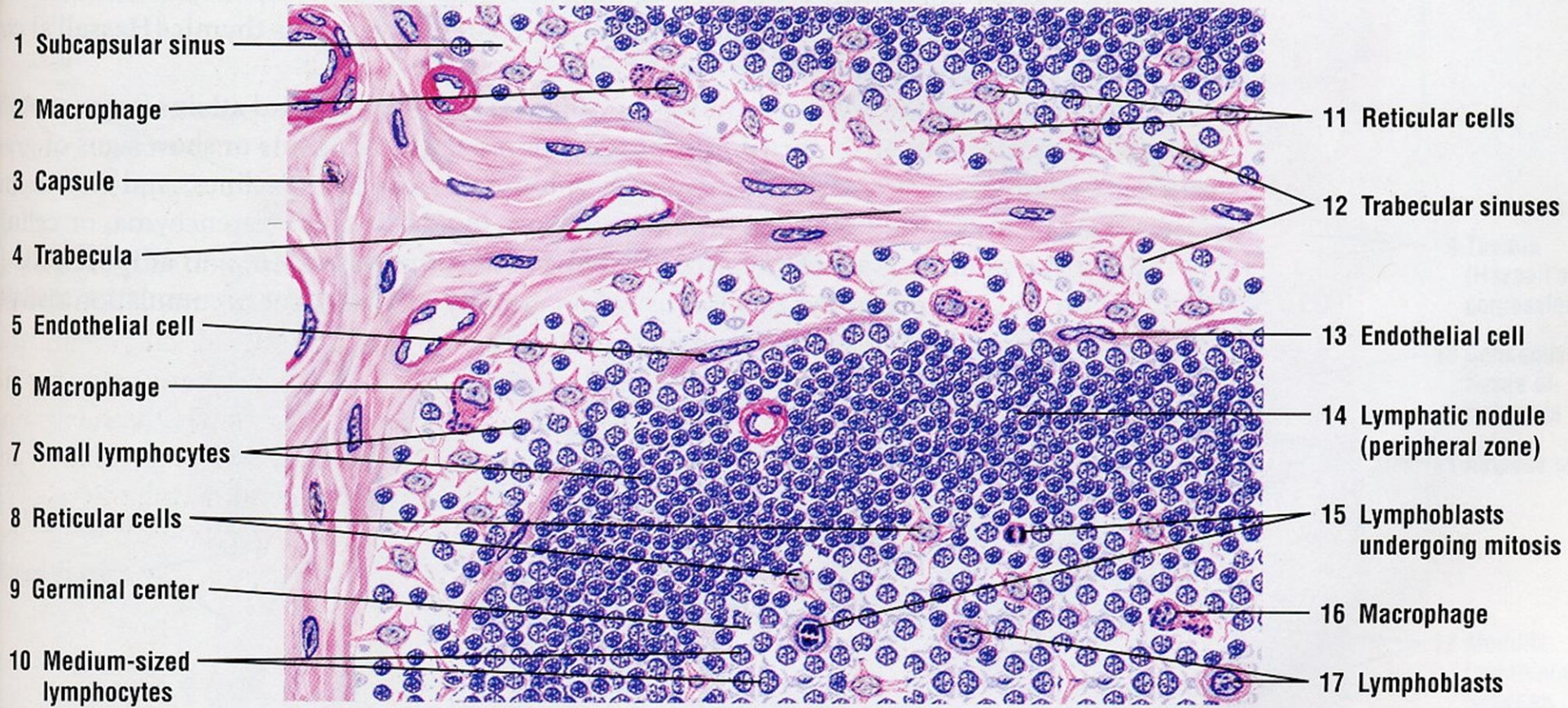
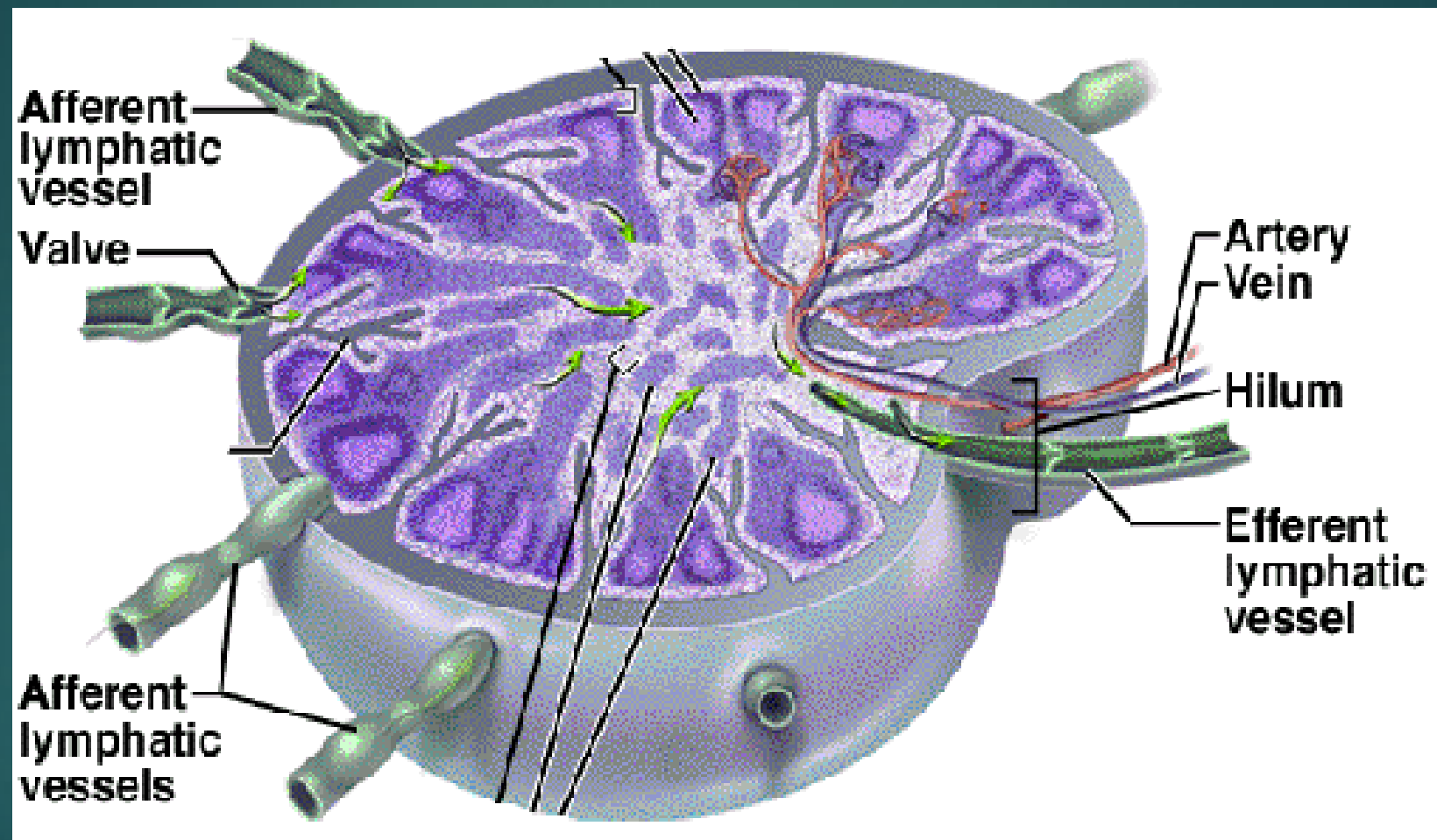


FIGURE 9.4 ■ Lymph node: subcortical sinus and lymphatic nodule. Stain: hematoxylin and eosin. High magnification.



Thymus

Location – behind the sternum in the mediastinum

The capsule divides it into 2 lobes

Development

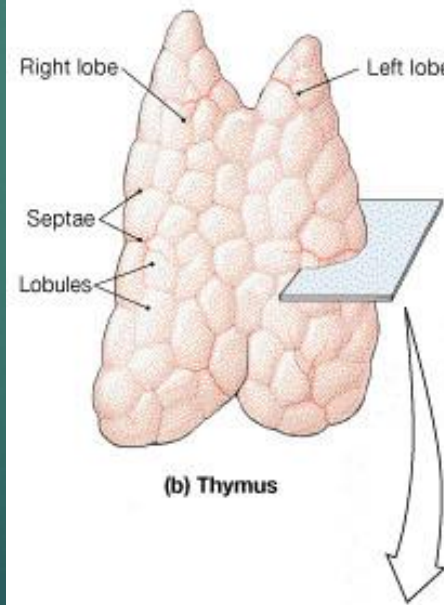
Infant – conspicuous

Puberty – maximum size

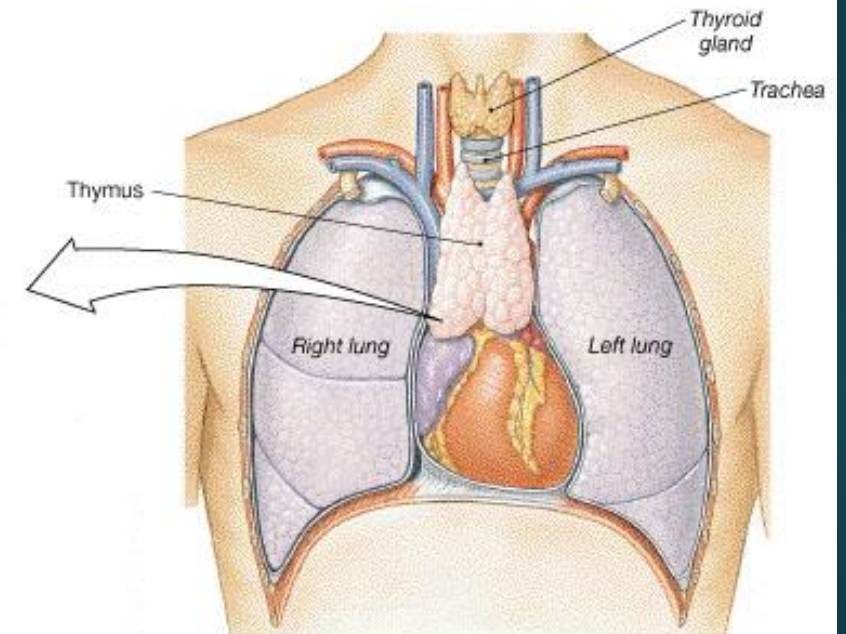
Maturity – decreases in size

Function

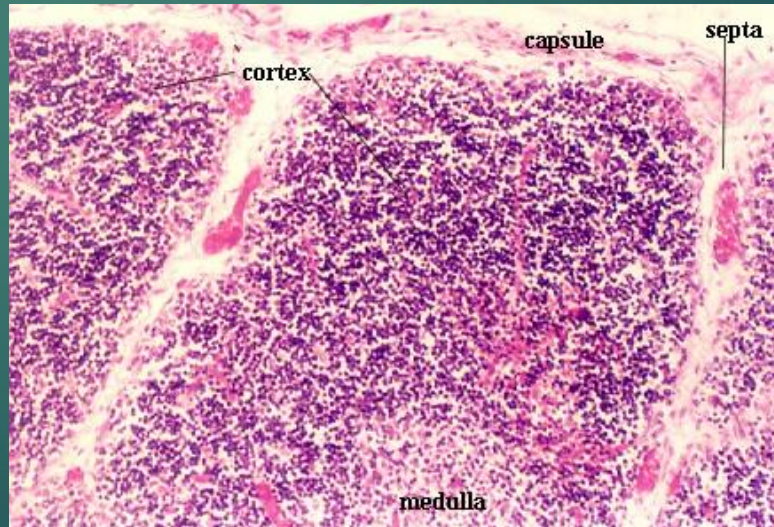
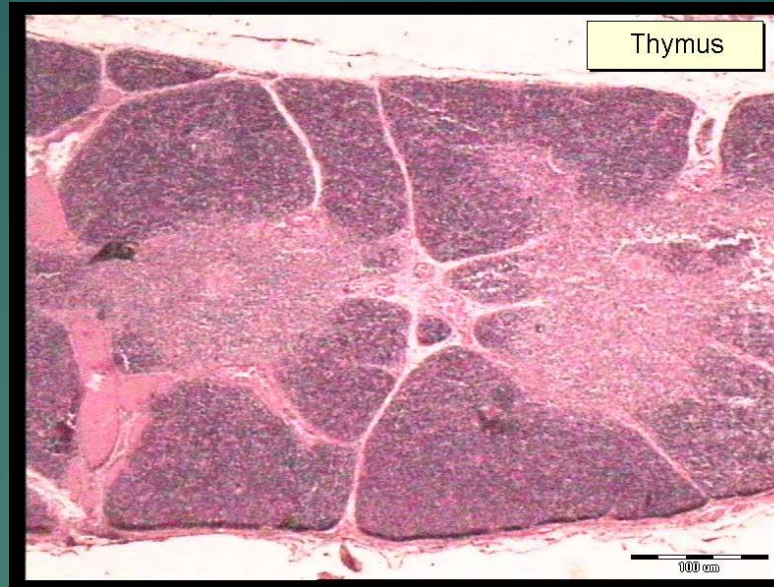
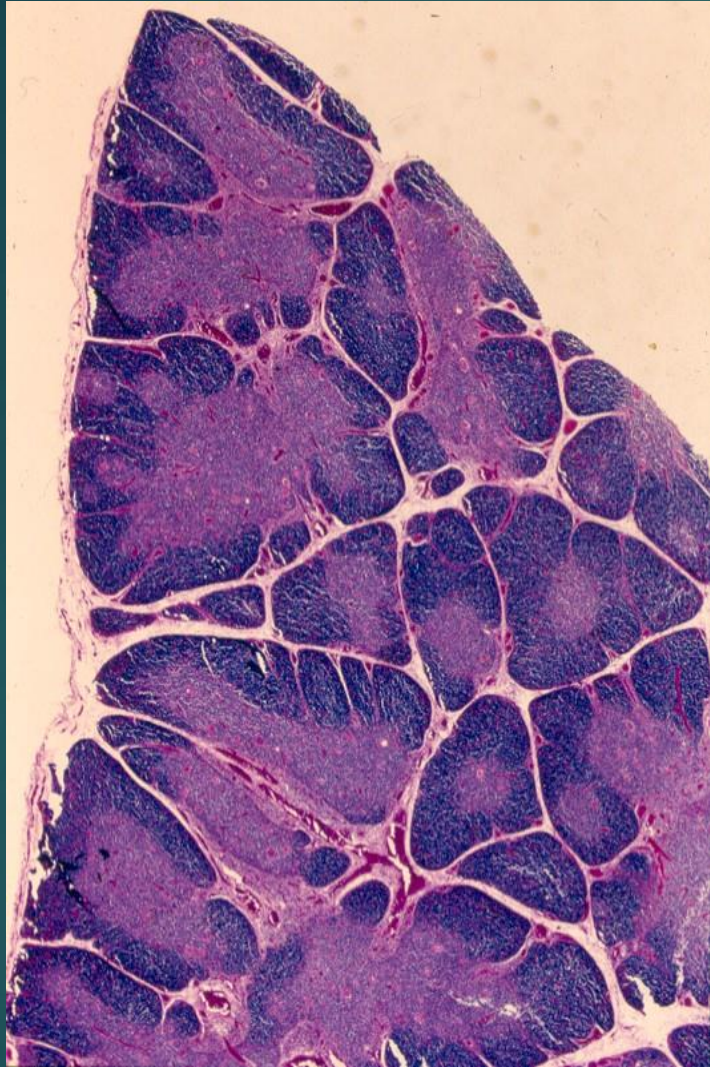
Differentiation and maturation of T cells



(b) Thymus



(a) Location of thymus within thoracic cavity



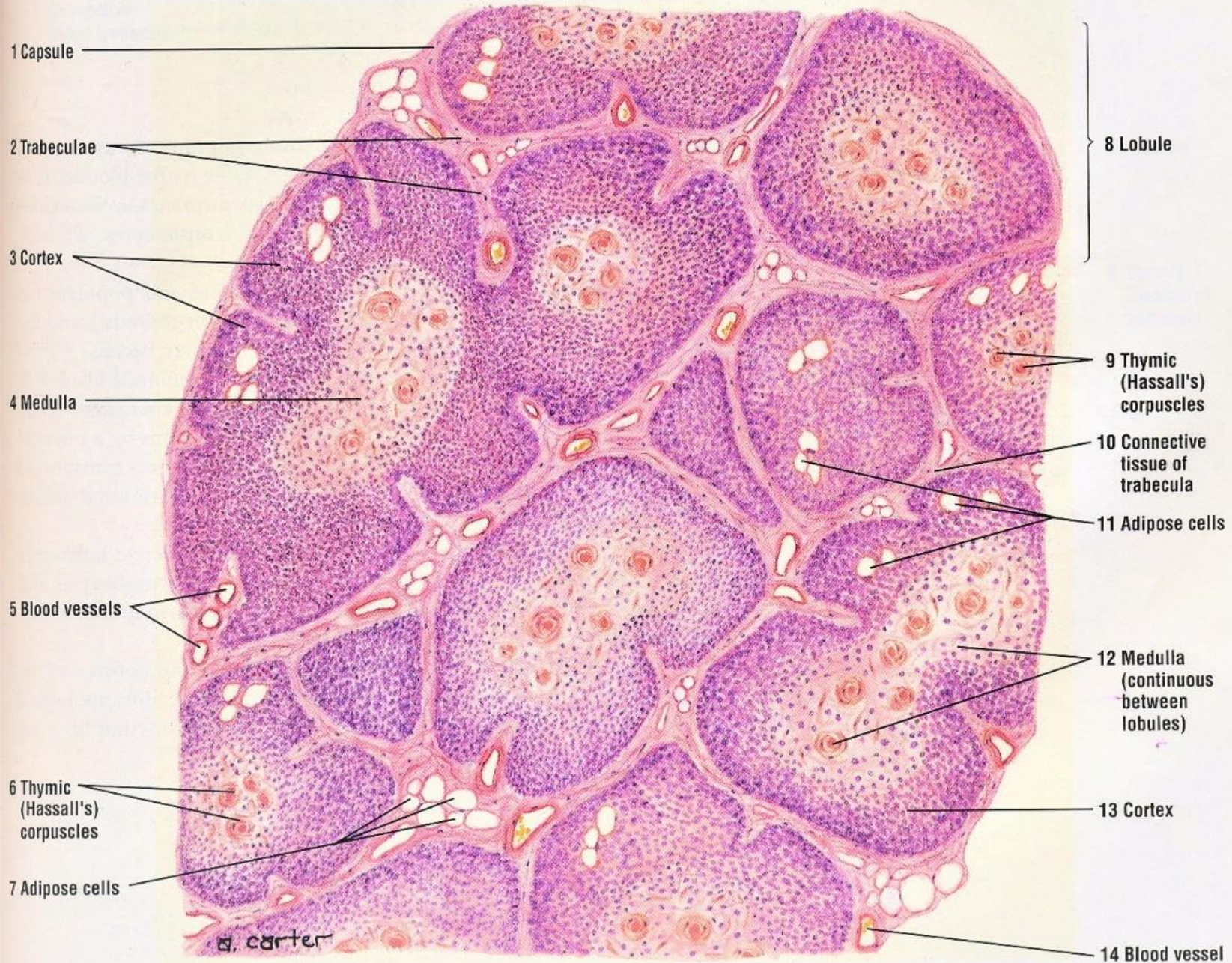
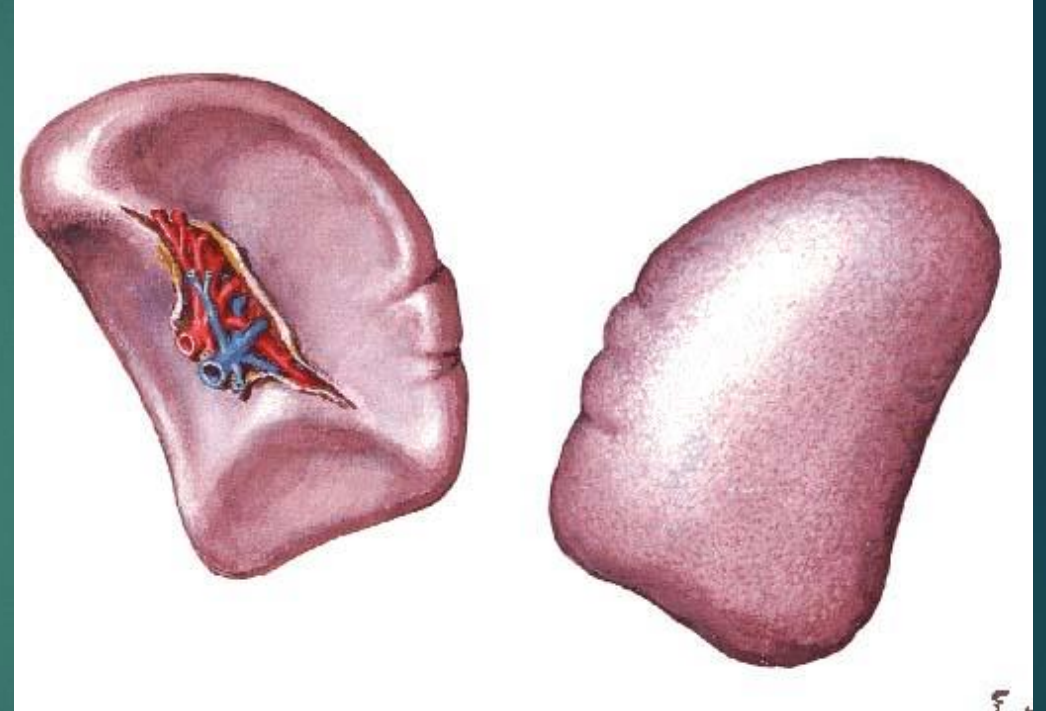


FIGURE 9.6 ■ Thymus gland (panoramic view). Stain: hematoxylin and eosin. Low magnification.

Spleen

- Largest lymphatic organ
- Located between the stomach & diaphragm
- Structure is similar to a node
 - Capsule present
 - But no afferent vessels or sinuses
- Histology
 - Red pulp contains all the components of circulating blood
 - White pulp is similar to lymphatic nodules
- Functions
 - Filters blood
 - Stores blood



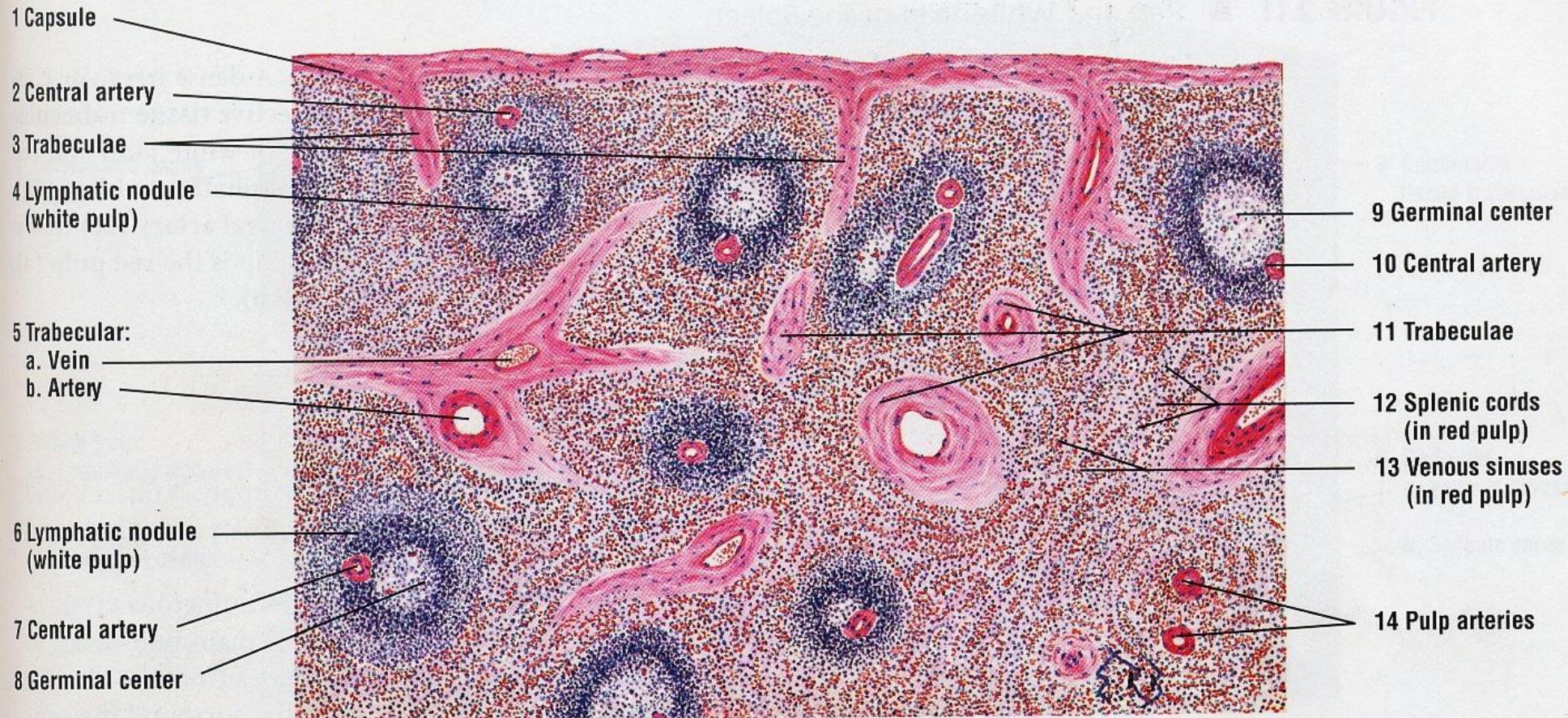


FIGURE 9.9 ■ Spleen (panoramic view). Stain: hematoxylin and eosin. Low magnification.

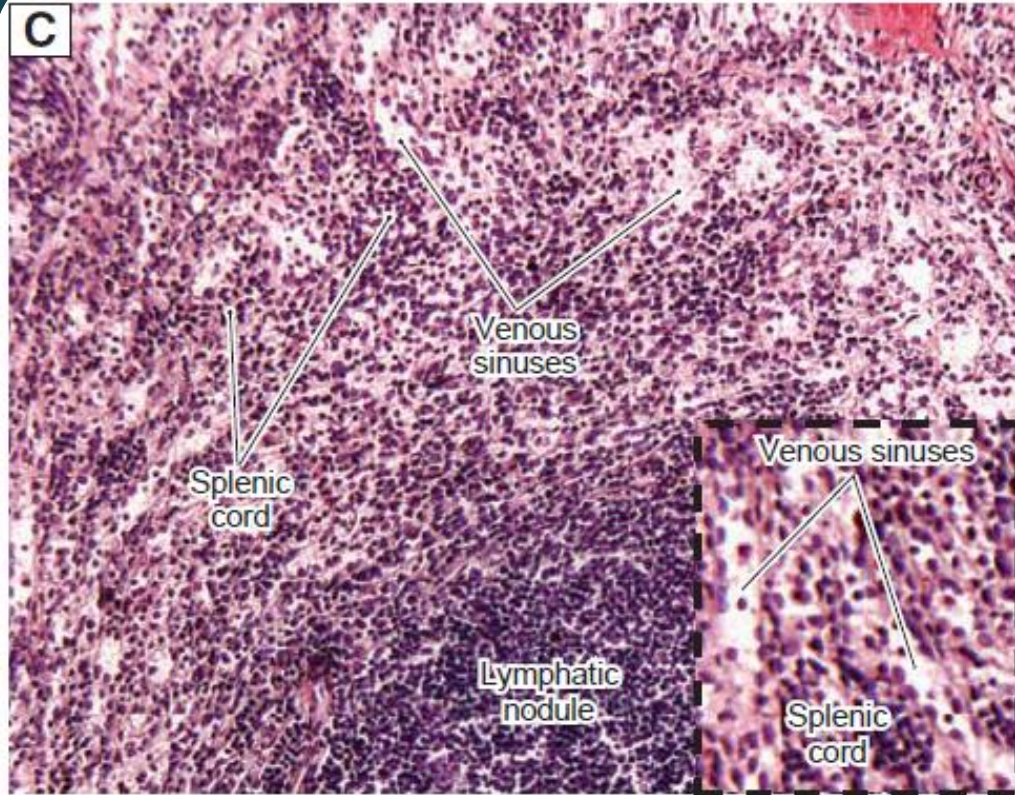


Figure 10-14C. Red pulp, spleen. H&E, $\times 256$; inset $\times 385$

Red pulp (red because it is rich in blood) stains light and contains splenic cords and venous sinuses that are filled with blood. Venous sinuses are discontinuous capillaries, which have large lumens, incomplete basal laminae, and gaps between endothelial cells. These special features allow blood cells to pass through the capillary wall (see Fig. 9-14A,B). The splenic cord is a framework of reticular tissue that contains B cells, T cells, plasma cells, macrophages, and other blood cells. Macrophages in the splenic cord often extend their processes into the lumen of the sinuses to reach and engulf foreign substances, microbes, and aged erythrocytes. The red pulp of the spleen also serves as a reservoir for platelets (Fig 10-16).

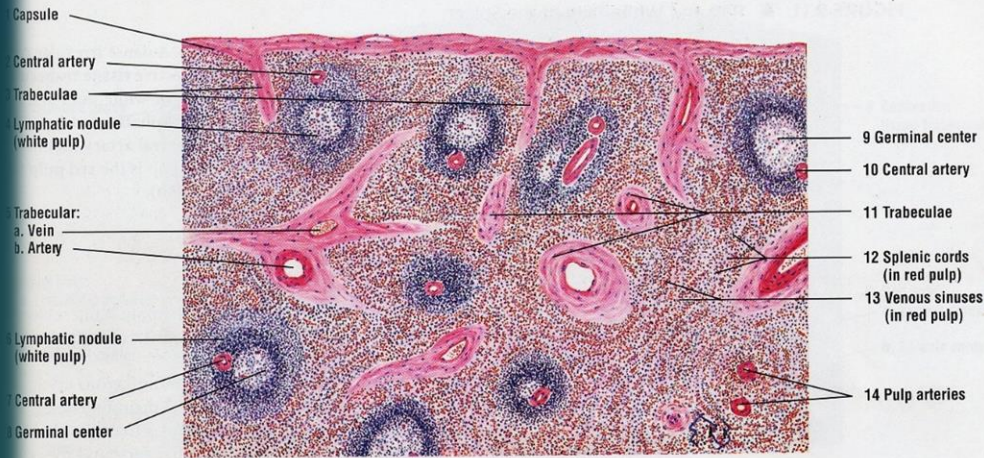


FIGURE 9.9 ■ Spleen (panoramic view). Stain: hematoxylin and eosin. Low magnification.

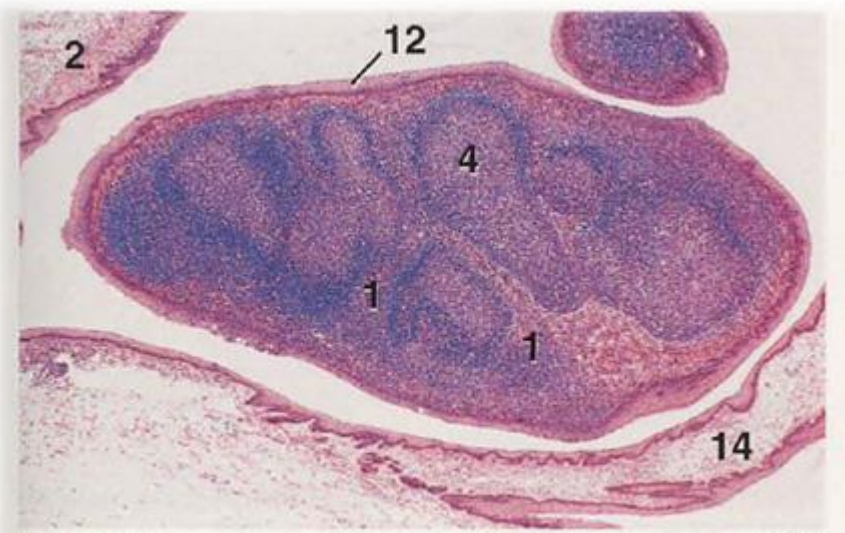


Figure 11.7

×12.5

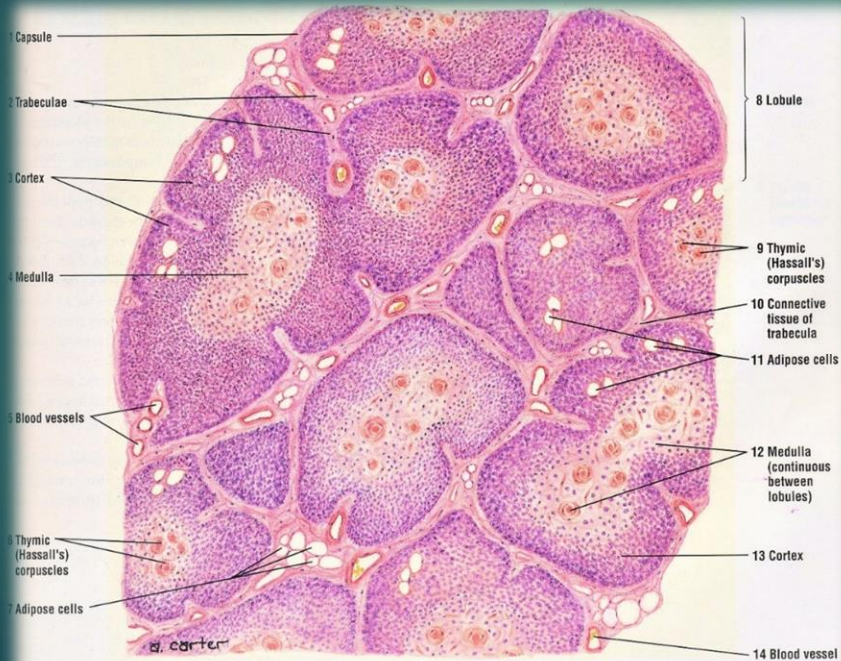


FIGURE 9.6 ■ Thymus gland (panoramic view). Stain: hematoxylin and eosin. Low magnification.

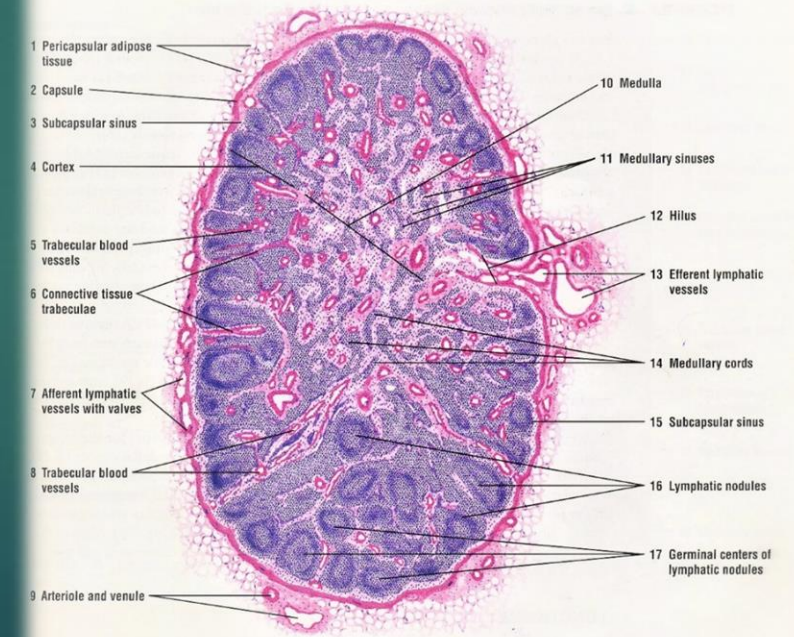
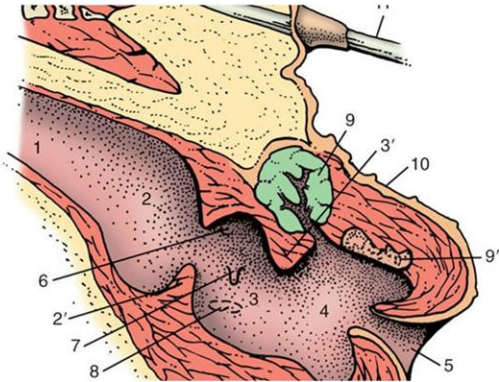
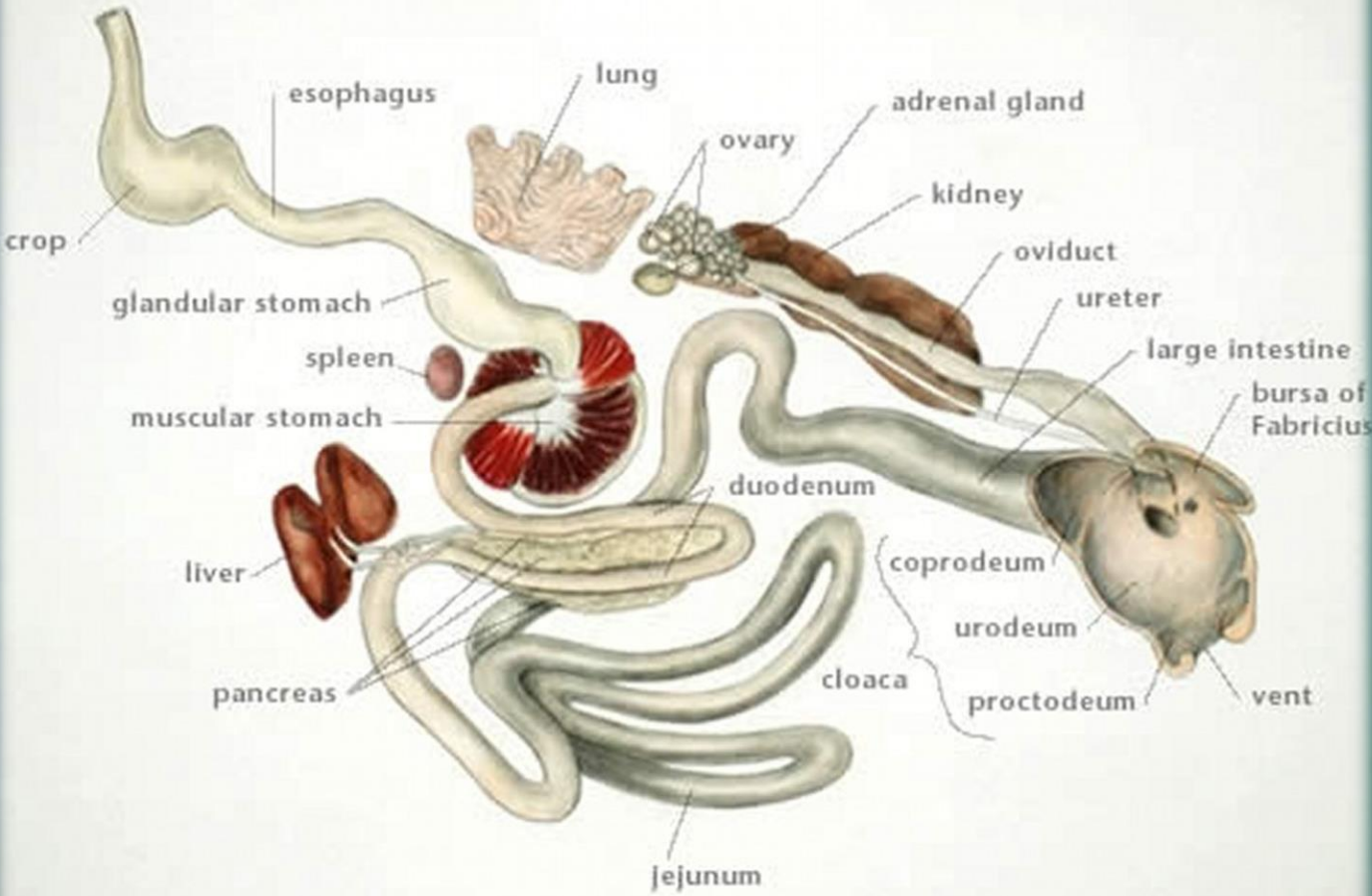


FIGURE 9.1 ■ Lymph node (panoramic view). Stain: hematoxylin and eosin. Medium magnification.

Cloacal bursa



Avian Cloaca

Figure 37-22. Median section of the cloaca, semischematic. 1, Colon; 2, coprodeum; 2', coprourodeal fold; 3, urodeum; 3', uroproctodeal fold; 4, proctodeum; 5, vent; 6, ureteric orifice; 7, papilla of deferent duct; 8, position of oviduct orifice (only on left side); 9, cloacal bursa; 9', dorsal proctodeal gland; 10, skin; 11, tail feather; 12, uropygial gland; 12', papilla of uropygial gland; 13, muscles surrounding caudal vertebrae.



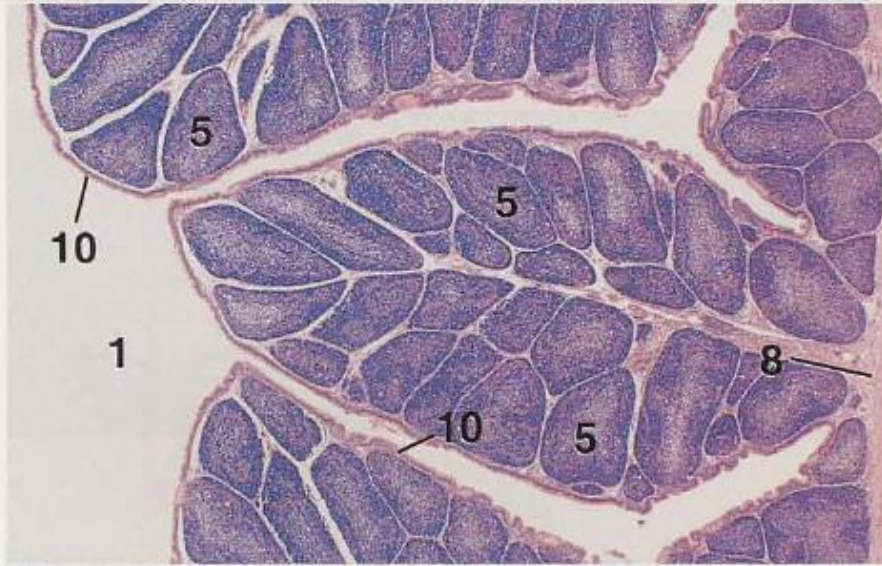


Figure 11.57

×12.5

Figure 11.57. Bursa of Fabricius, Chicken. Portions of the long mucosal folds (plicae) project into the lumen of the bursa. Numerous follicles, each composed of a cortex and medulla, fill the lamina propria of each fold.

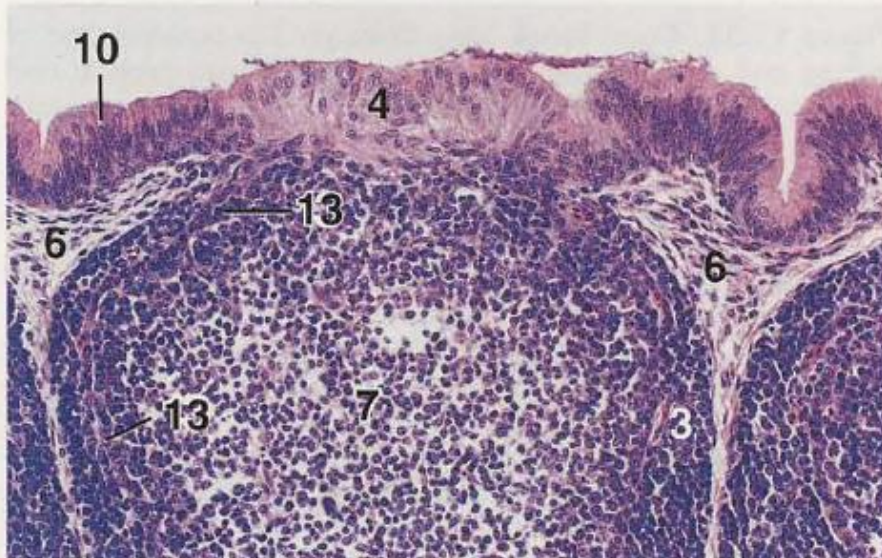


Figure 11.58

×125

Figure 11.58. Bursa of Fabricius, Chicken. Where the apex of a follicle contacts the epithelium, tall, pale columnar cells with apical nuclei form an epithelial tuft. Elsewhere, mucosal folds are covered by a pseudostratified columnar epithelium.

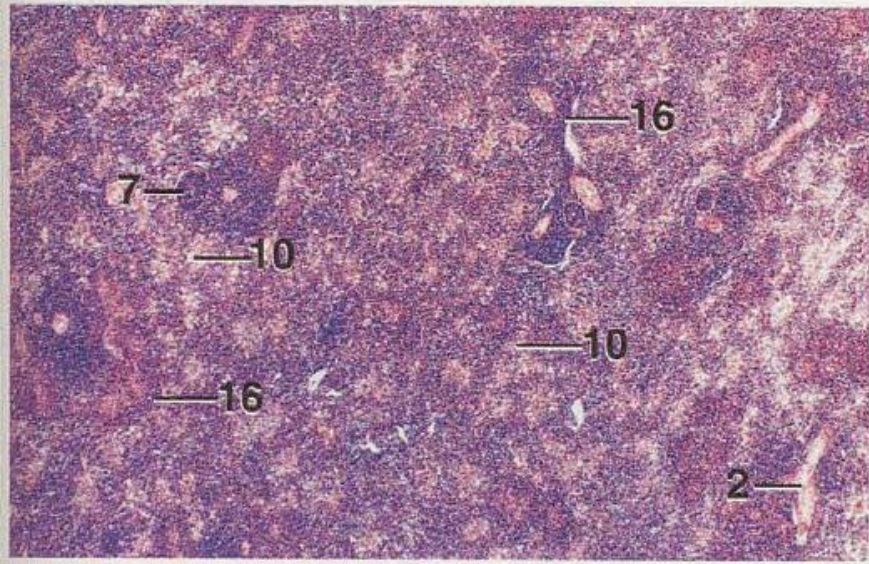


Figure 11.52

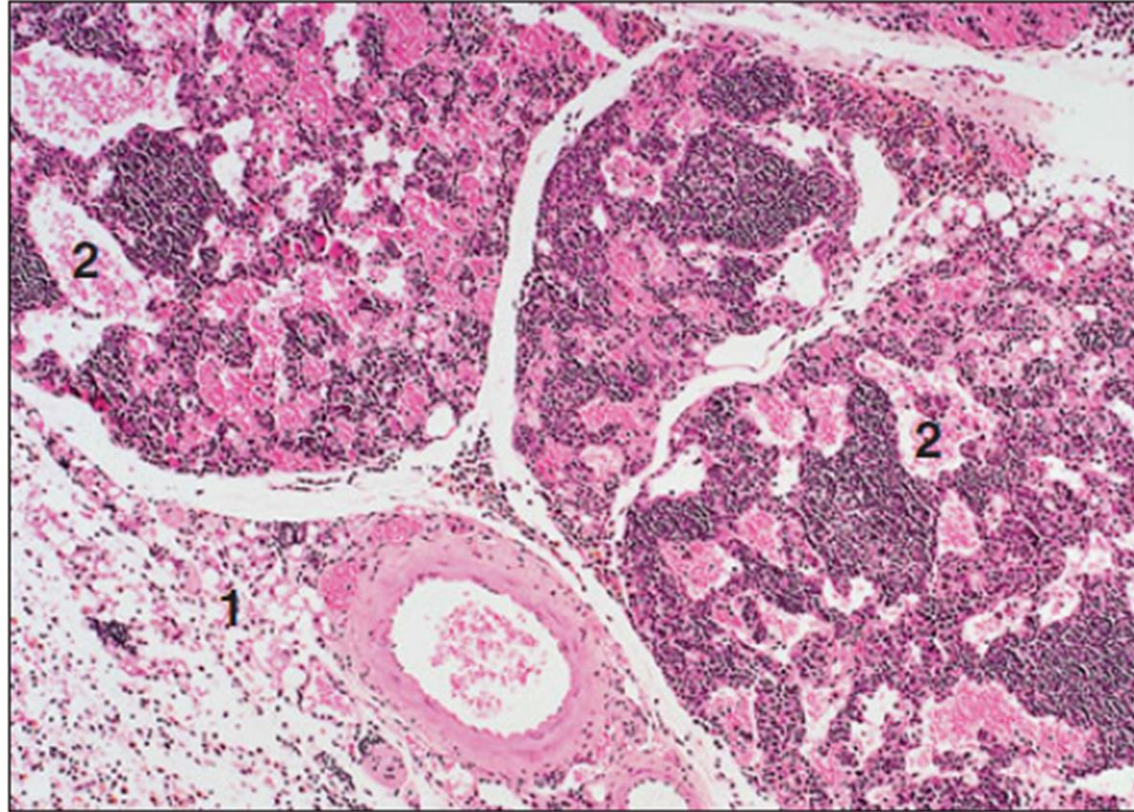
×25

KEY

- | | |
|------------------------|------------------------------|
| 1. Adipose tissue | 9. Muscularis externa |
| 2. Blood vessel | 10. Red pulp |
| 3. Connective tissue | 11. Reticular cell |
| 4. Crypt of Lieberkühn | 12. Sheathed artery, lumen |
| 5. Erythrocyte | 13. Smooth muscle of capsule |
| 6. Granulocyte | 14. Thymic tissue |
| 7. Lymphatic nodule | 15. Villus |
| 8. Mesothelium | 16. White pulp |

Chicken spleen

Haemal Node



15.14 Haemal lymph node (ox). (1) Connective tissue capsule. (2) Blood filled sinusoids. H & E. $\times 20$.

