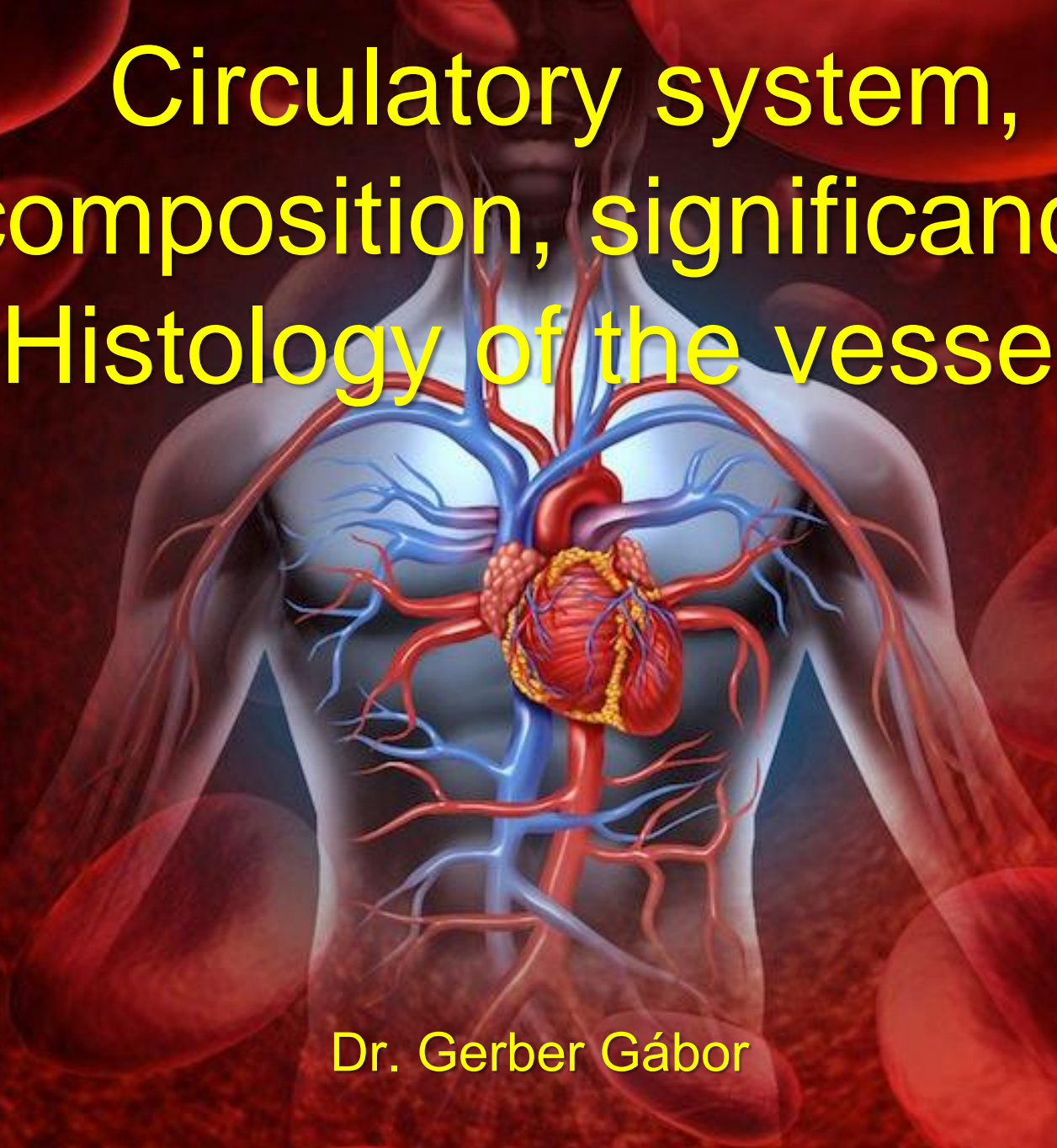


Circulatory system, composition, significance. Histology of the vessels

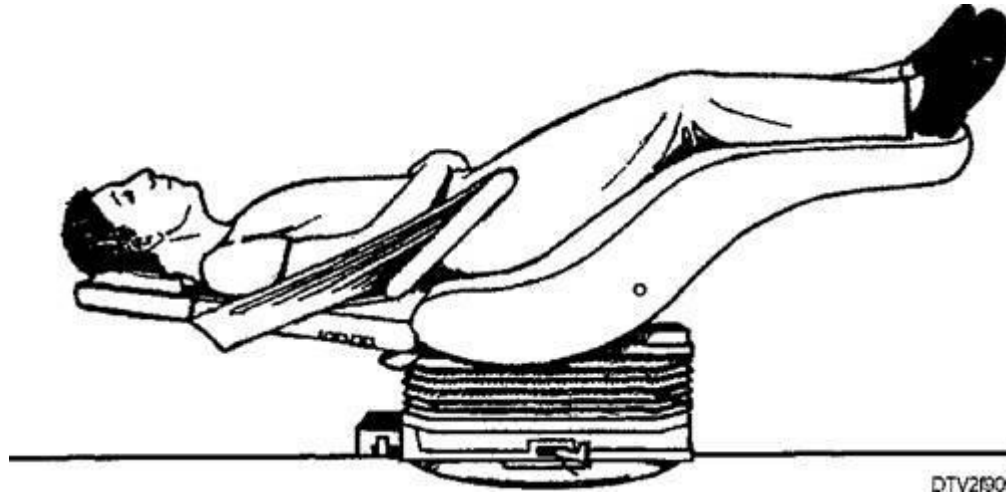


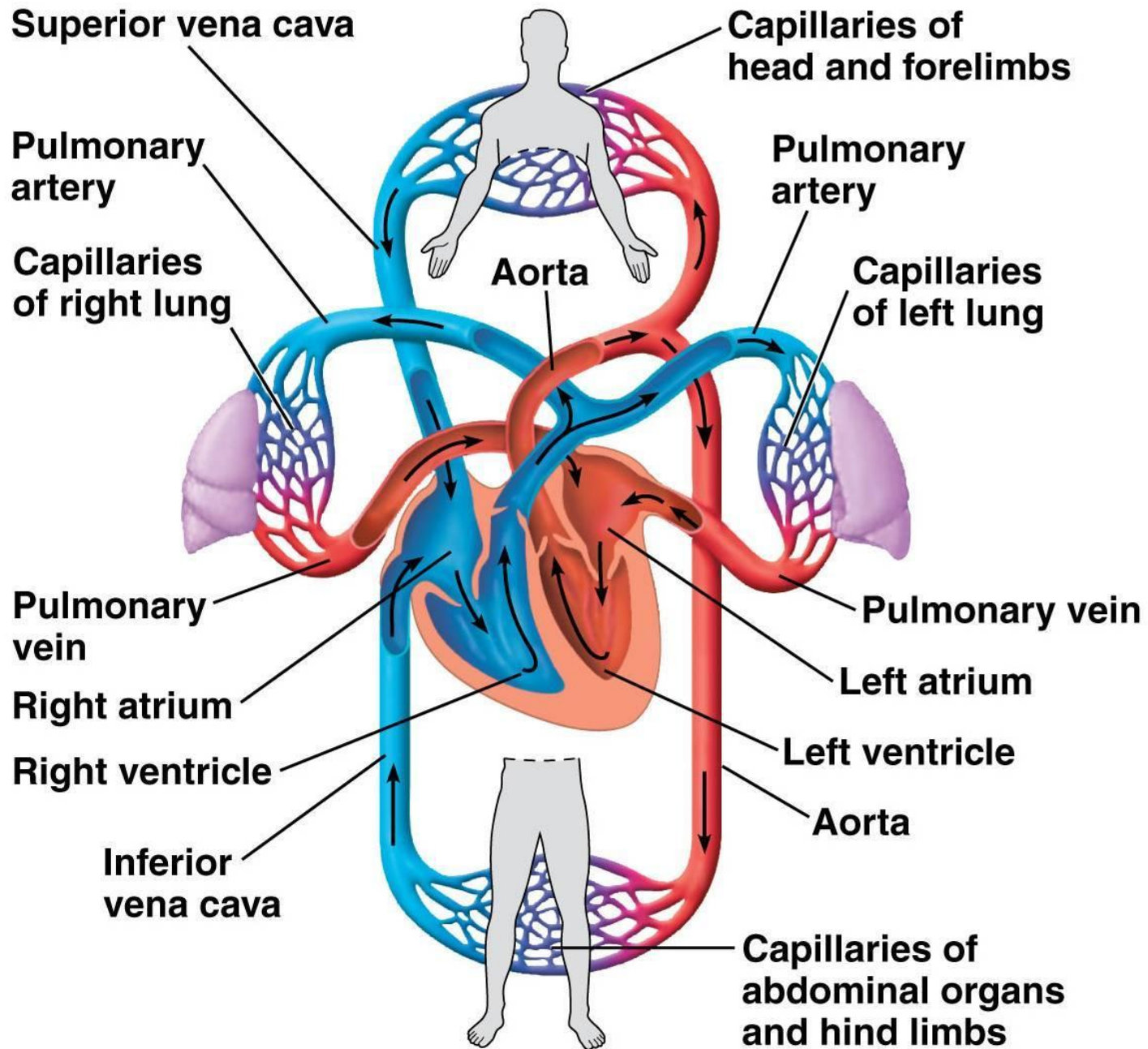
Dr. Gerber Gábor

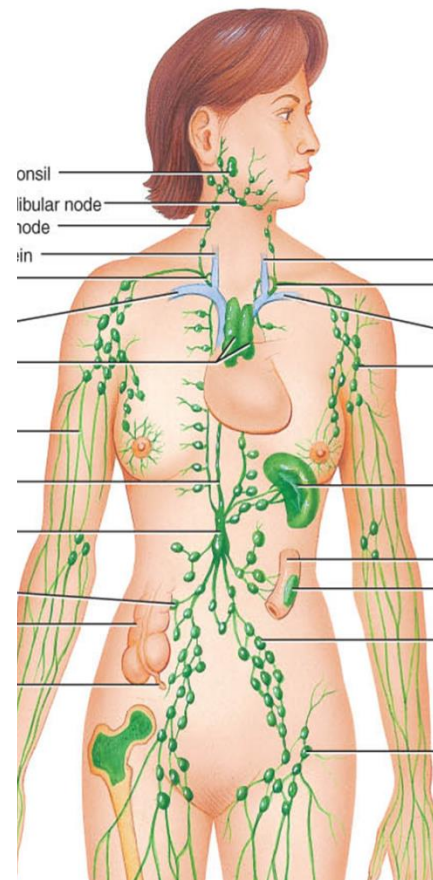
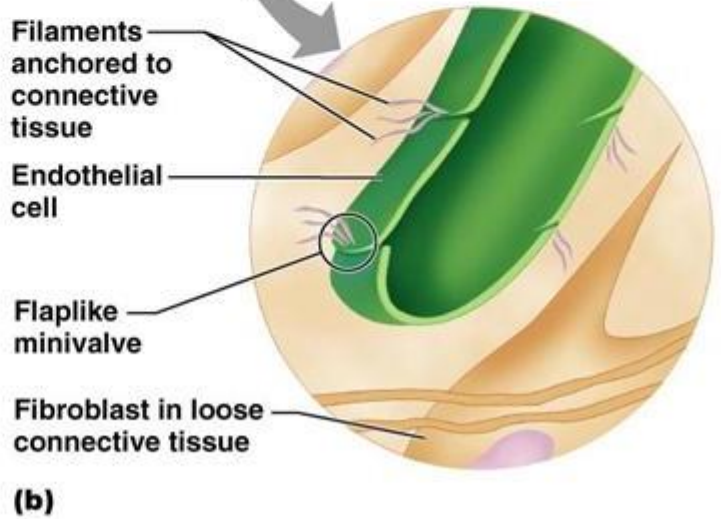
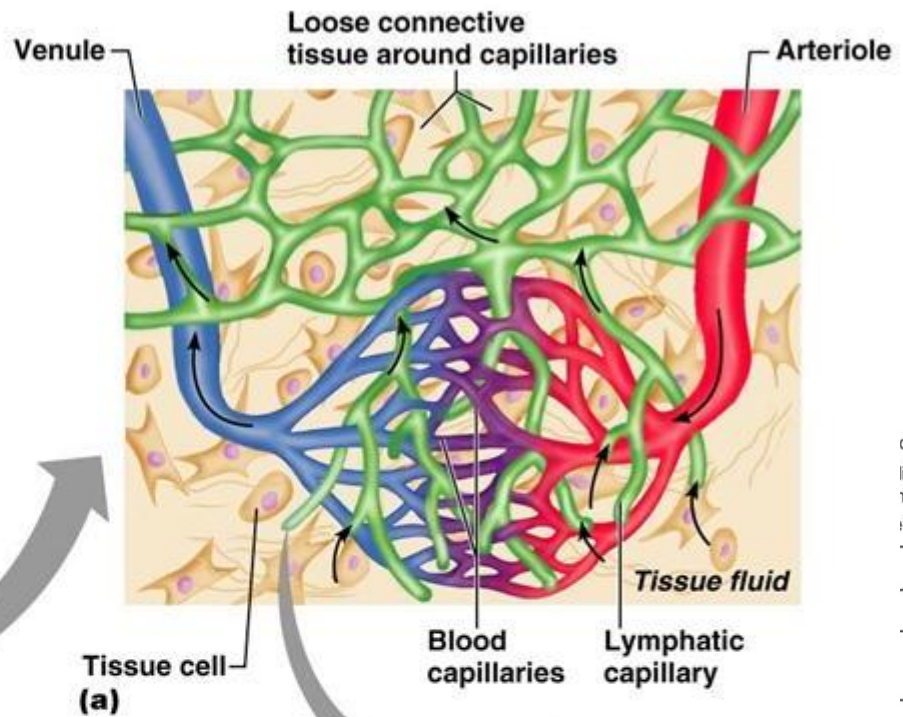
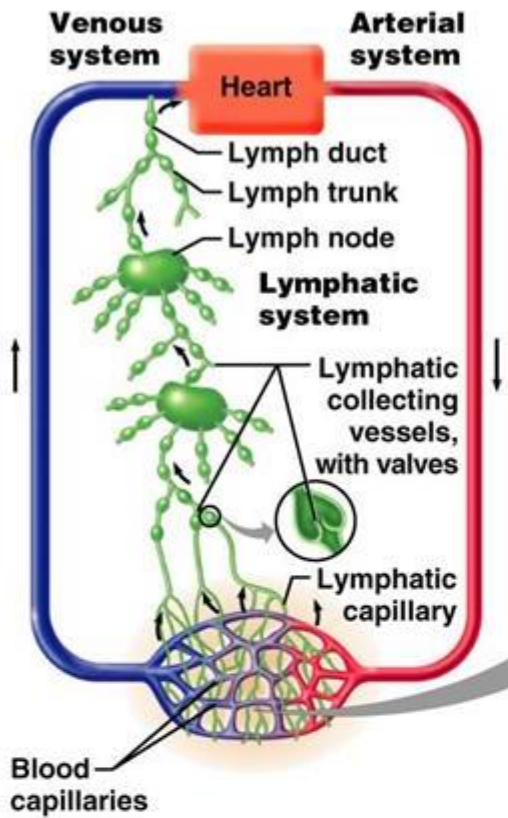
**Academic Year 2018/2019 Second Semester
Anatomy, Histology and Embryology 2 ED I 1-5**

Week	Lectures <i>Tuesday 8.00-9.40 and Thursday 11.00-11.45</i>	Practical sessions	
		Dissection room <i>Thursday 15.00-16.30</i>	Histology lab <i>Friday 12.00-12.30</i>
Week 1 Febr. 4-8.	1. Circulatory system, composition, significance. Histology of the vessels 2. Lymphatic organs 1- lymph node, tonsils 3. Lymphatic organs 2 - spleen, thymus	Dissection of heart, visceral complex	Vessels: arteries, veins, arterioles, venules, capillaries. Lymphatic organs: tonsils
Week 2. Febr. 11-15	4. Chambers of the heart, external features 5. Structure of heart wall, myocardium, valves, anuli fibrosi 6. Vessels, innervation, conducting system, surface projection of the heart, pericardium	Dissection of heart, visceral complex	Lymphatic organs: spleen, thymus
Week 3. Febr. 18-22.	7. <i>Development of the heart (Film)</i> 8. <i>Development of the arteries and veins; malformations</i> 9. Gastrointestinal tract. Fine structure of the hollow and parenchymal viscera	Dissection of heart, visceral complex	Oral cavity: lip, filiform, fungiform vallate papillae, radix linguae
Week 4. Febr. 25- March 1.	10. Morphology and histology of the oral cavity, soft palate and faucial isthmus 11. Morphology and histology of the tongue and salivary glands 12. <i>Development of the face (film)</i>	Midterm test 1 Heart, great vessels, heart and vessels' development, fetal circulation	Ground teeth, tooth bud. Parotid, submandibular, sublingual glands
Week 5. March 4-8.	13. <i>Development of the pharyngeal pouches and the tongue</i> 14. Pharynx and parapharyngeal spaces 15. Morphology and histology of the esophagus, the stomach,	Dissection: cervical viscera, vessels and nerves, branches of the aorta	Gastrointestinal tract: Oesophagus, cardia, fundus, pylorus of the stomach, duodenum, jejunum
Week 6. March 11-15. March 14 is National Holiday	16. Morphology and histology of the small intestine and pancreas 17. Morphology and histology of the large intestine and rectum 18. Morphology and histology of the liver and biliary system. Portal vein	Dissection: cervical viscera, vessels and nerves, branches of the aorta	No Histology class for Grs 1-5
Week 7. March 18-22.	19. <i>Development of the fore-, mid- and hindgut</i> 20. Peritoneum, cross sections 21. Development of serous membranes, separation of body cavities	Demonstration of peritoneum, dissection of abdominal organs, vessels.	Ileum, colon, vermiform appendix Liver, gall bladder, pancreas
Week 8. March 25-29.	22. Morphology of the nasal cavity and paranasal sinuses 23. Larynx, cartilages, joints, muscles 24. Larynx, connective tissue skeleton, mucous membrane	Dissection: visceral complex (abdominal organs, vessels)	Midterm test 2 Vessels, heart, lymphatic organs, gastrointestinal tract
Week 9. April 1-5.	25. Mediastinum, cross sections 26. Morphology of the trachea and lung, pleura. 27. Histology and development of the respiratory system	Demonstration of thoracic and abdominal situs on embalmed cadaver	Respiratory system: larynx, trachea, lung.
Week 10. April 8-12.	28. Morphology and histology of the kidney 29. Morphology and histology of the urinary passages, pelvis, ureter, and bladder 30. Development of the uropoietic apparatus	Dissection: visceral complex (abdominal organs, vessels)	Urinary system: kidney, ureter, urinary bladder
Easter break (2019 April 15-19.)			
Week 11. April 23-26.	31. Morphology of the testicle. Spermiogenesis. 32. Morphology and histology of the epididymis, spermatic cord and the seminal vesicle and prostate 33. Coats of the testicles. Hernia canals.	Midterm test 3 Anatomy and development of gastrointestinal and respiratory systems, cross sections of the thorax and abdomen	Male genitals: testis, epididymis, spermatic cord, seminal vesicle, prostate
Week 12. April 29- May 3. April 30 is Faculty day	34. - Faculty Day 35. - Faculty Day 36. Morphology and histology of penis and male urethra	Retropitoneum, kidney, ureter, suprarenal gland, pancreas, vessels Dissection of the abdominal and pelvic visceral complexes	Penis, glans penis. Female genitals: ovary, corpus luteum,
Week 13. May 6-10.	37. Morphology and histology of the ovary and the uterine tube. Oogenesis. 38. Morphology and histology of the uterus, divisions and content of the broad ligament 39. Morphology and histology of the vagina and the external genital organs	Dissection of abdominal and pelvic visceral complexes. Demonstration of pelvic situs.	Uterine tube, uterus (proliferation, secretion), vagina
Week 14. May 13-17.	40. The pelvic and urogenital diaphragms (male, female) 41. Cross sections of the male and female pelvis 42. Development and malformations of the genital system, hermaphroditism.	Group test Urogenital apparatus, pelvic floor, perineum, hernia canals	Review

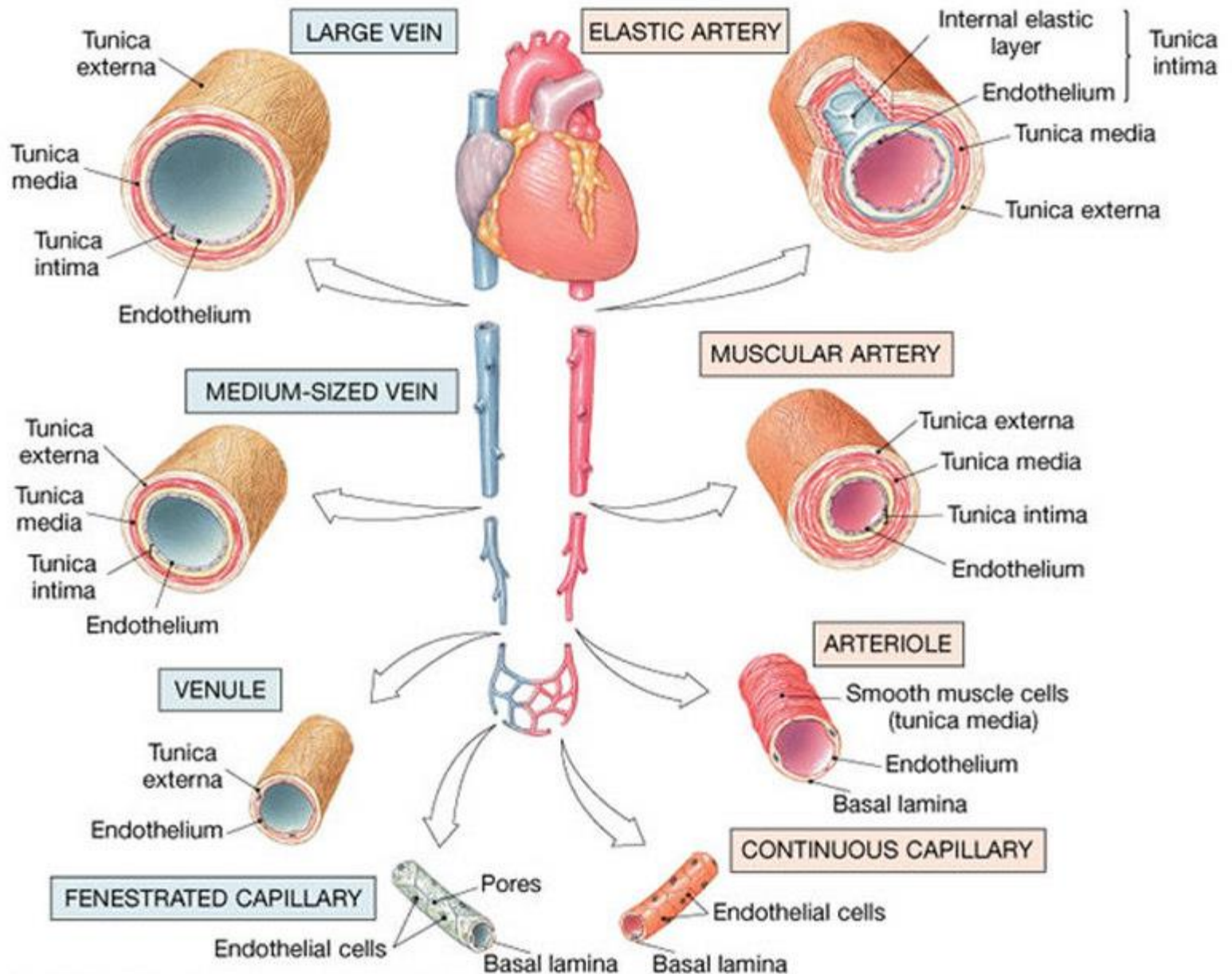
Trendelenburg position

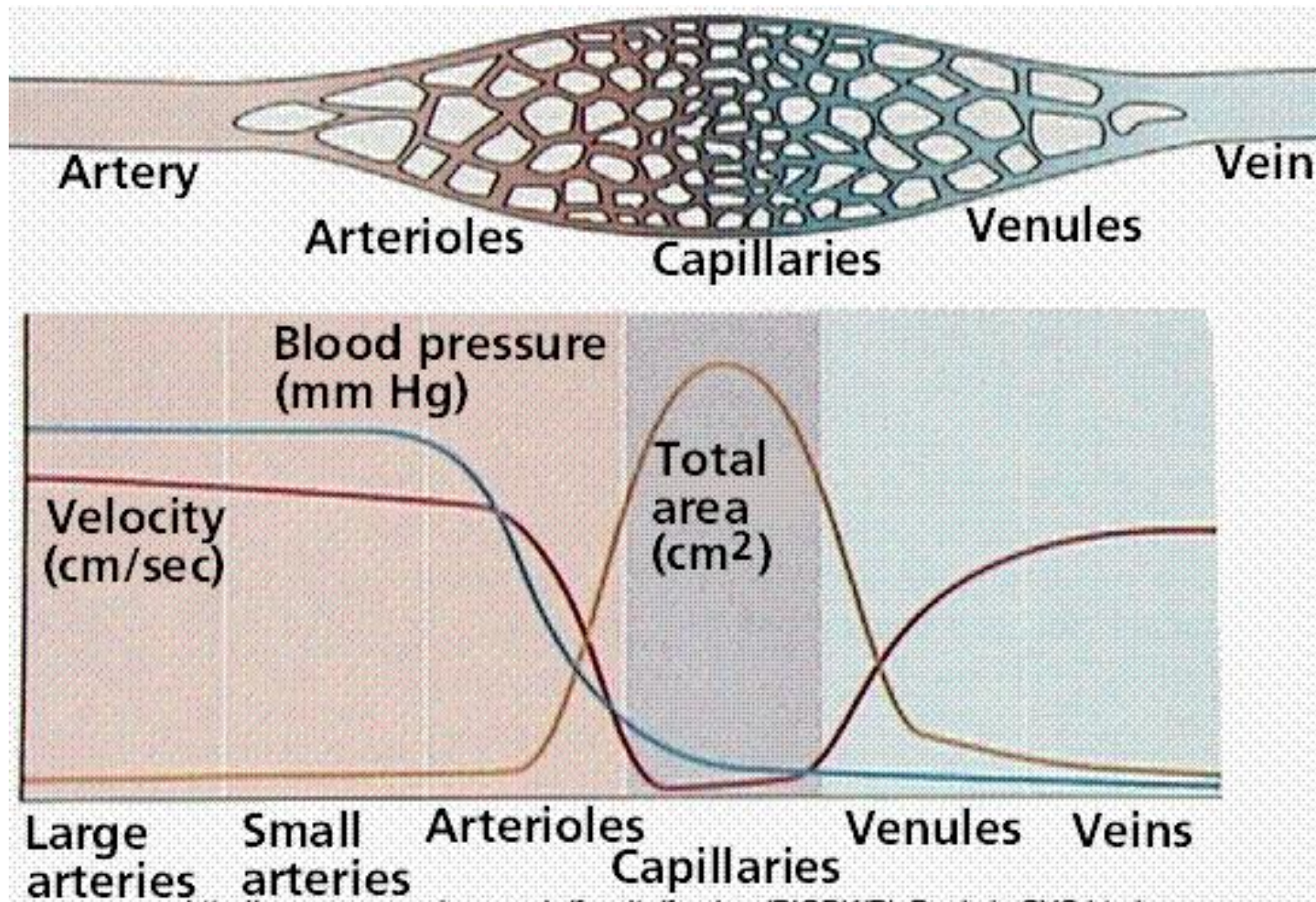






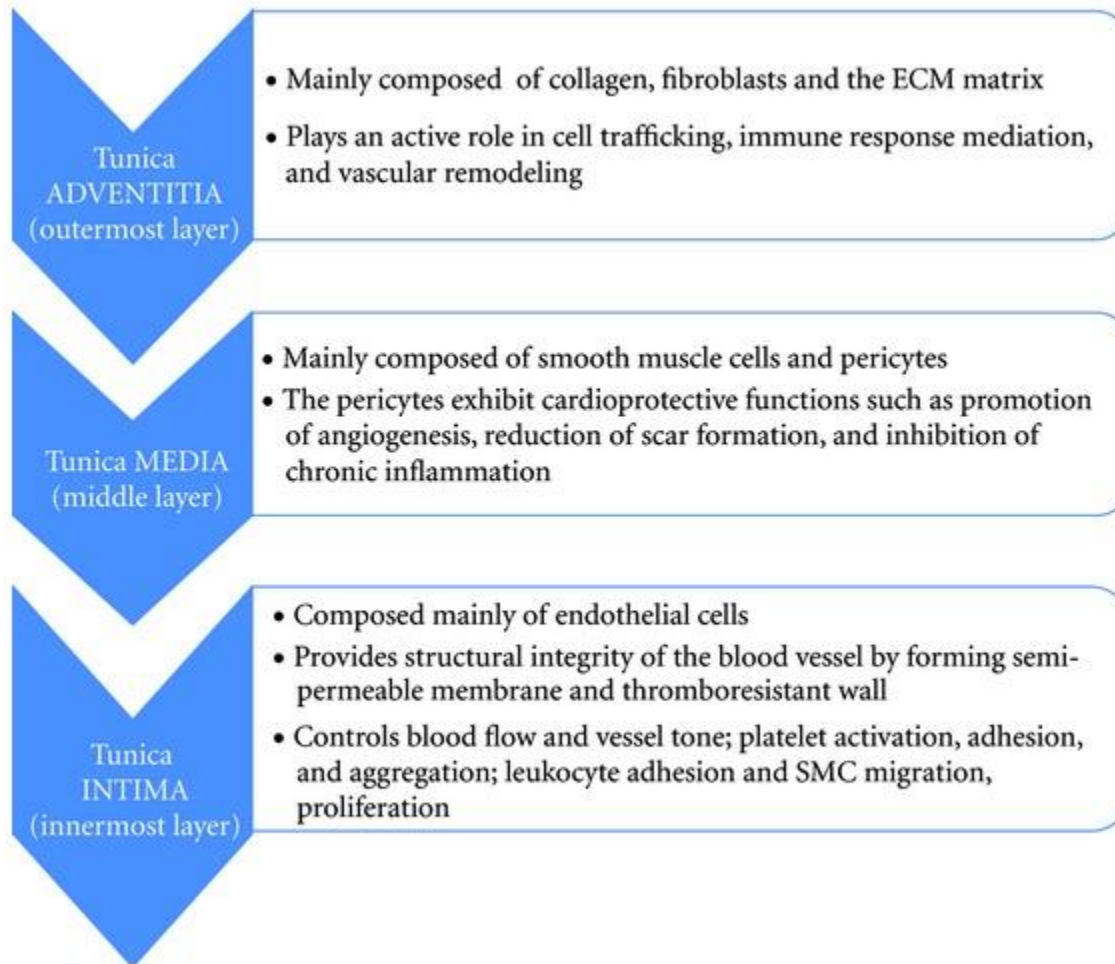
Blood vessels types

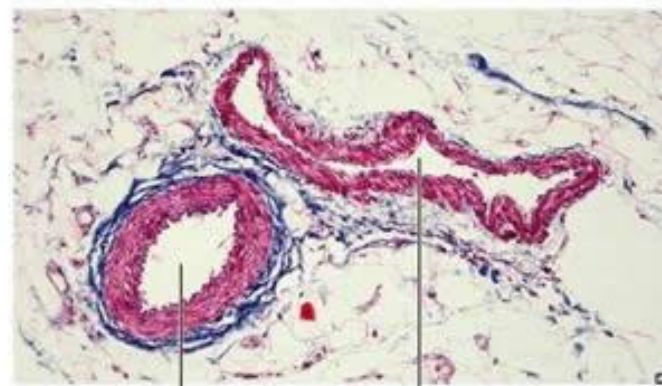




<http://www.emc.maricopa.edu/faculty/farabee/BIOBK/BioBookcircSYS.html>

Wall of blood vessels 3 main layers:

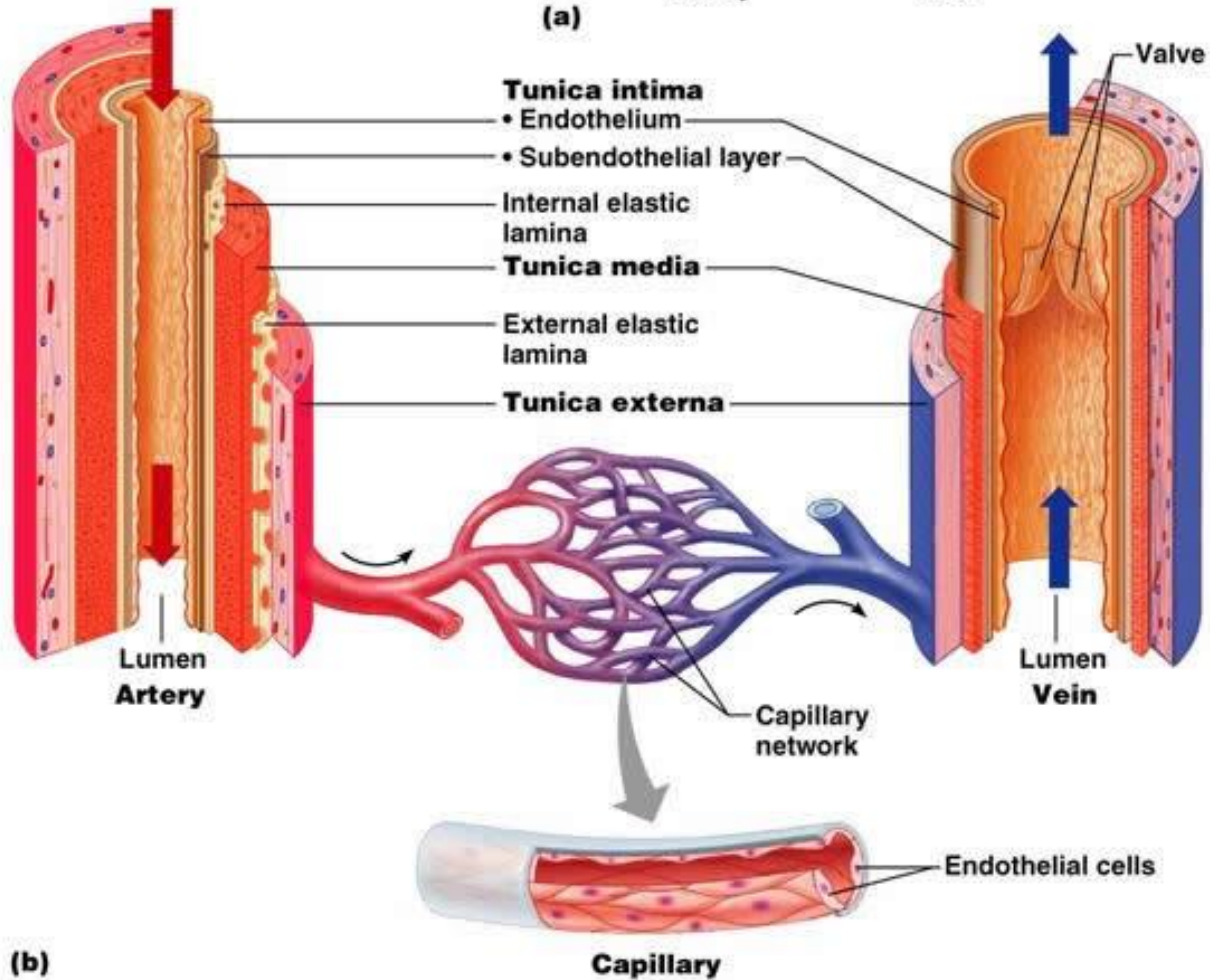




Artery

Vein

(a)



Tunica intima

• Endothelium

• Subendothelial layer

Internal elastic lamina

Tunica media

External elastic lamina

Tunica externa

Valve

Lumen
Artery

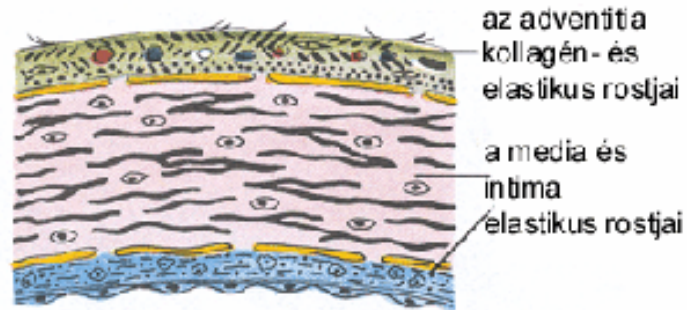
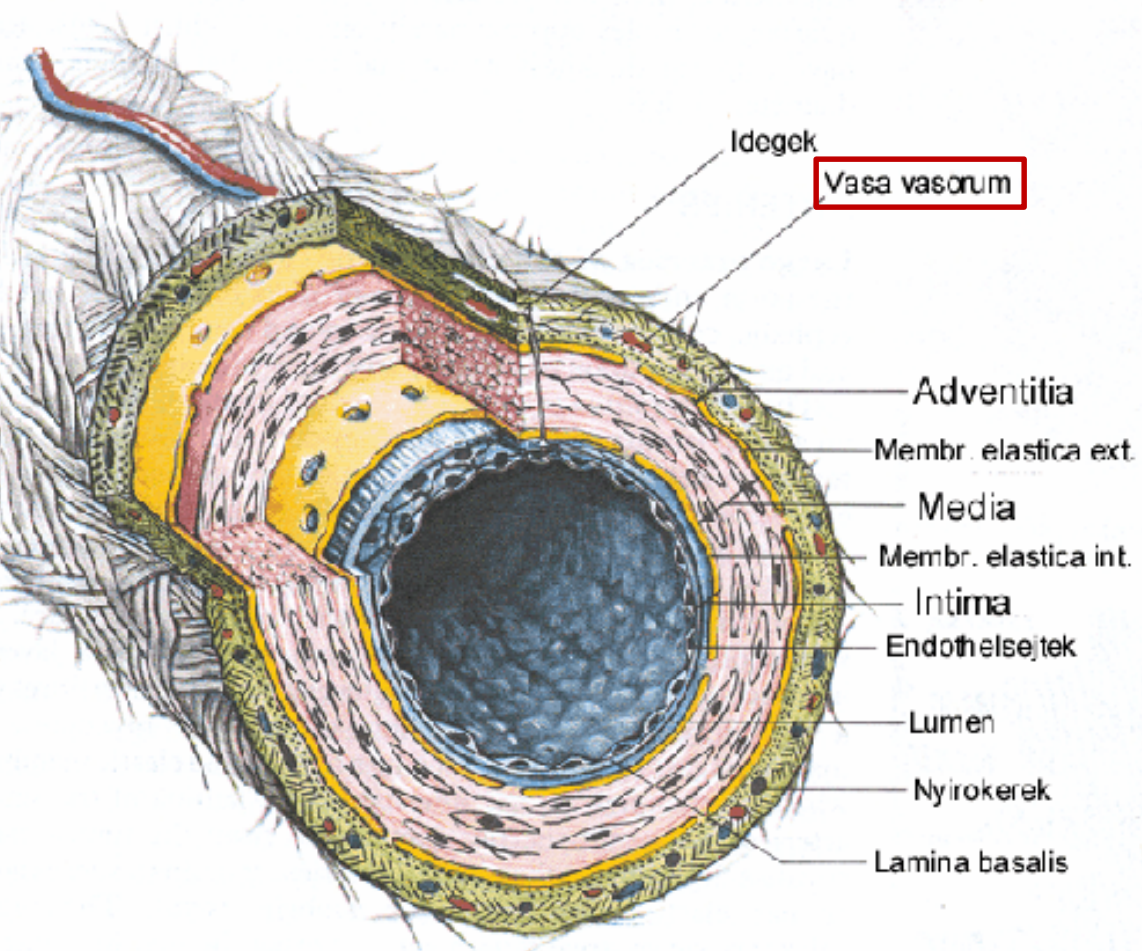
Lumen
Vein

Capillary
network

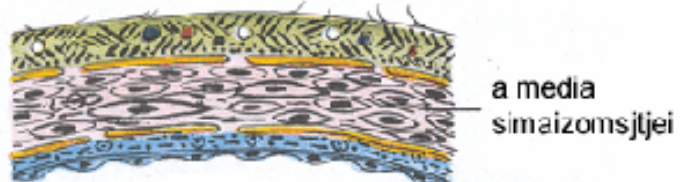
Endothelial cells

Capillary

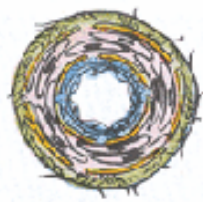
(b)



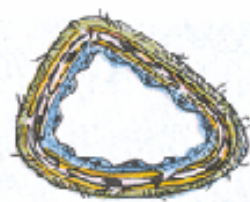
Elastikus típusú arteria



Muskularis típusú arteria



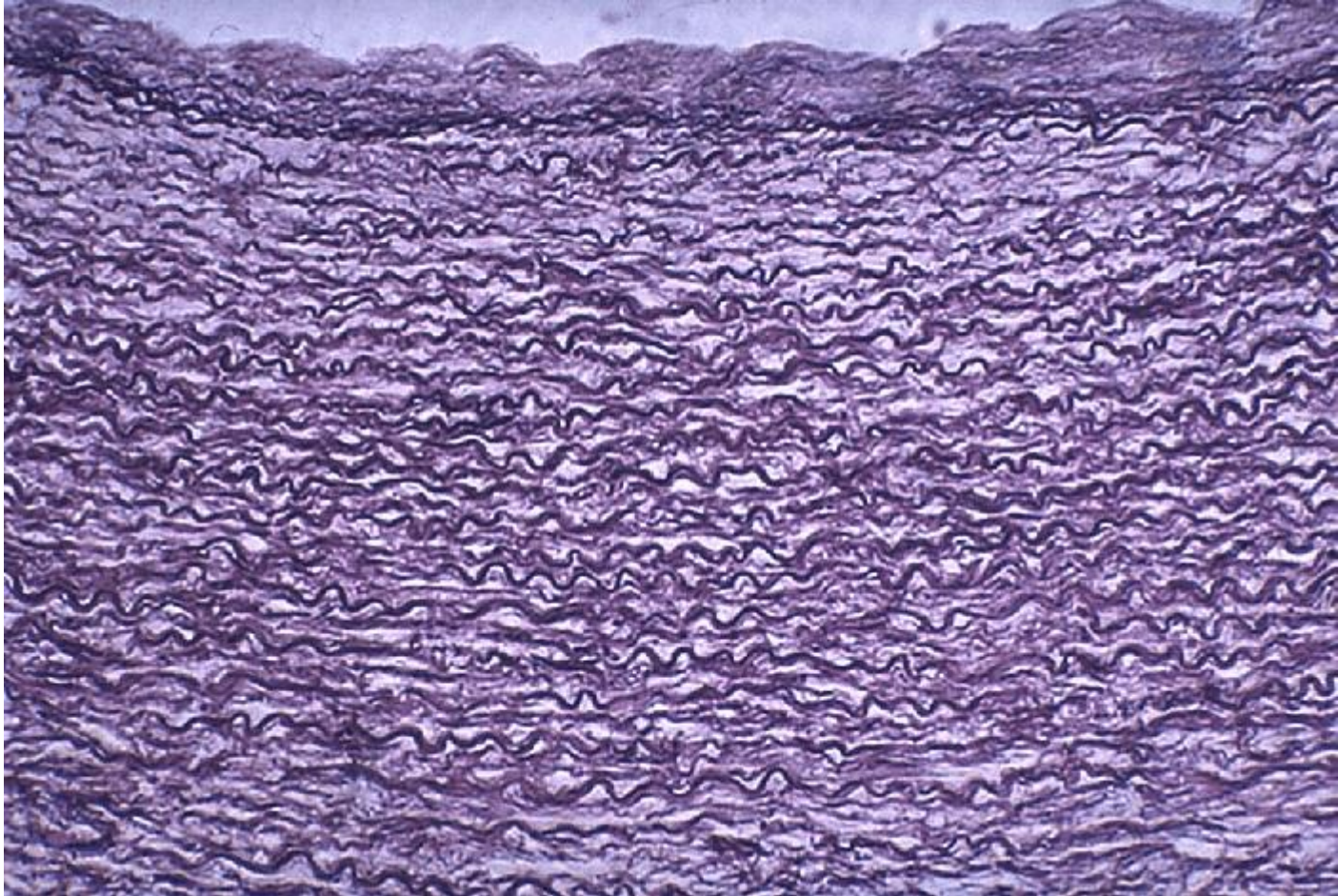
Arteriola

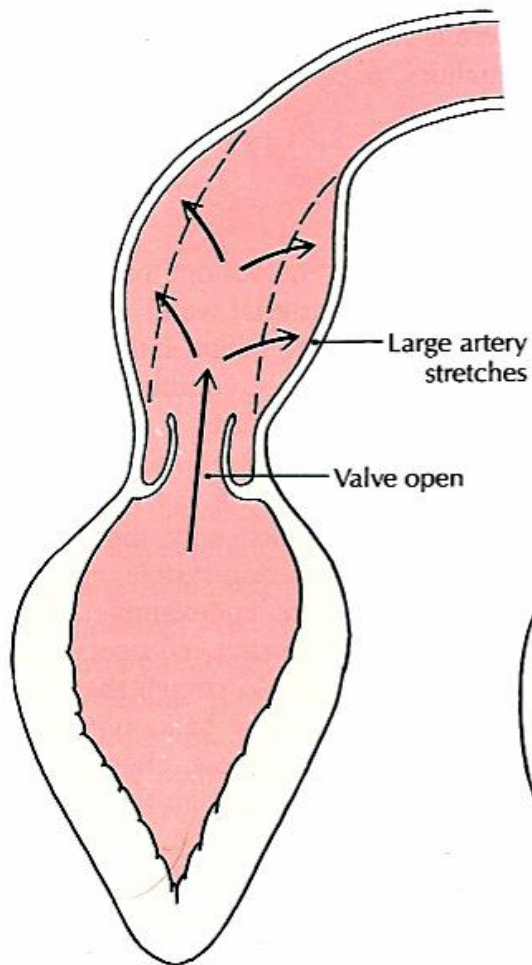


Venula

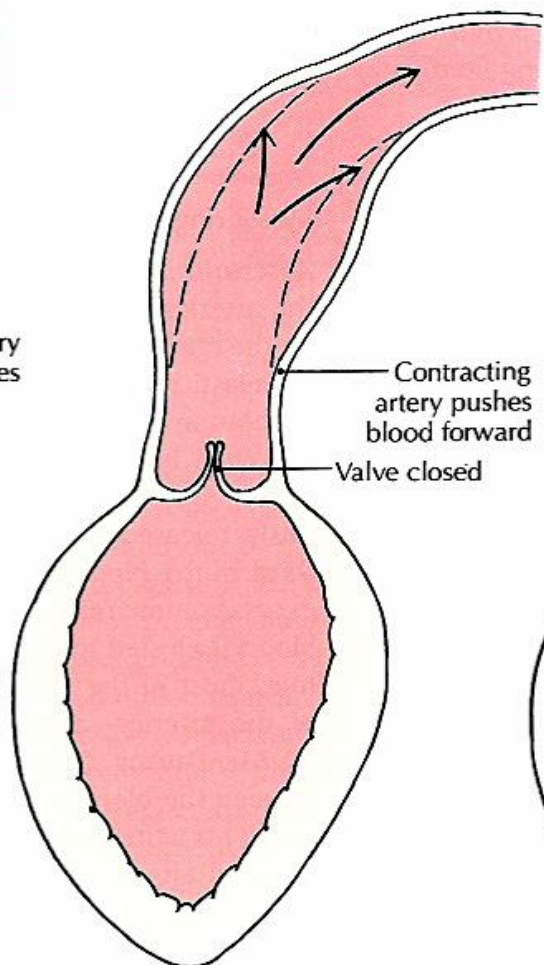


Vena

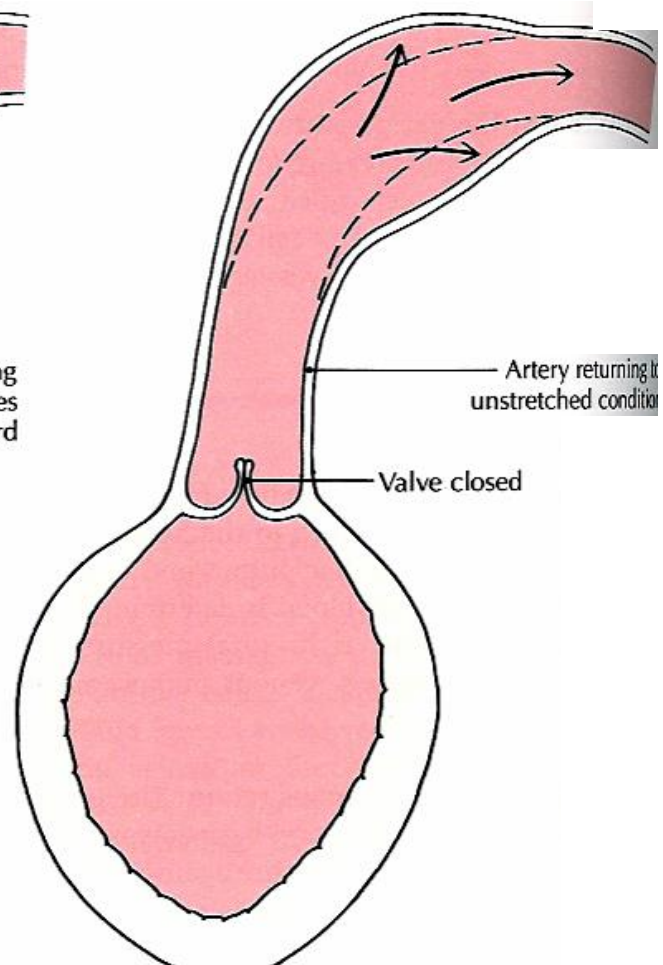




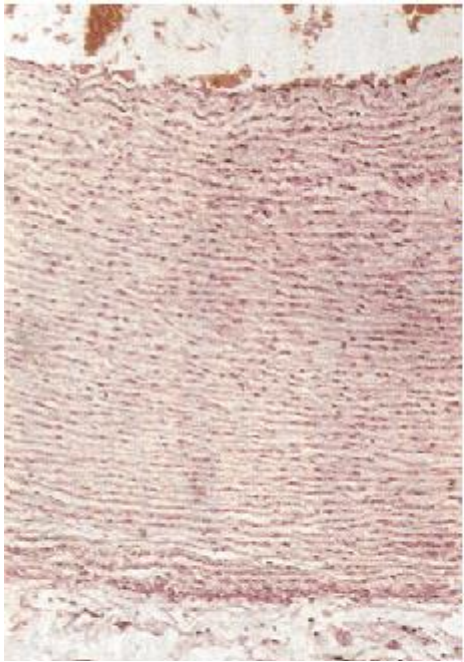
[A] SYSTOLE



[B] EARLY DIASTOLE



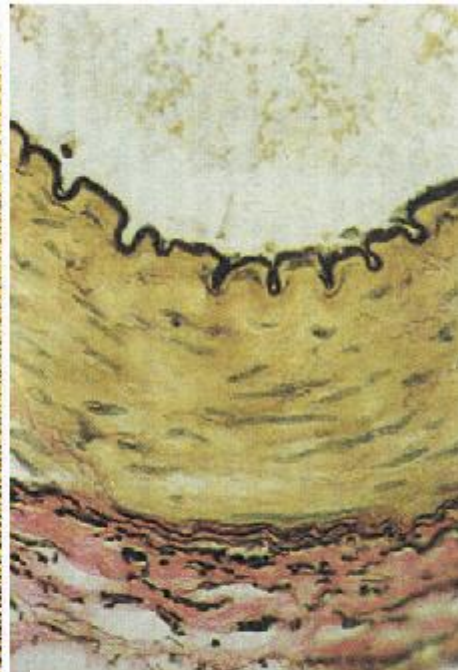
[C] LATE DIASTOLE



Elastic type artery
(Aorta)
(H-E)



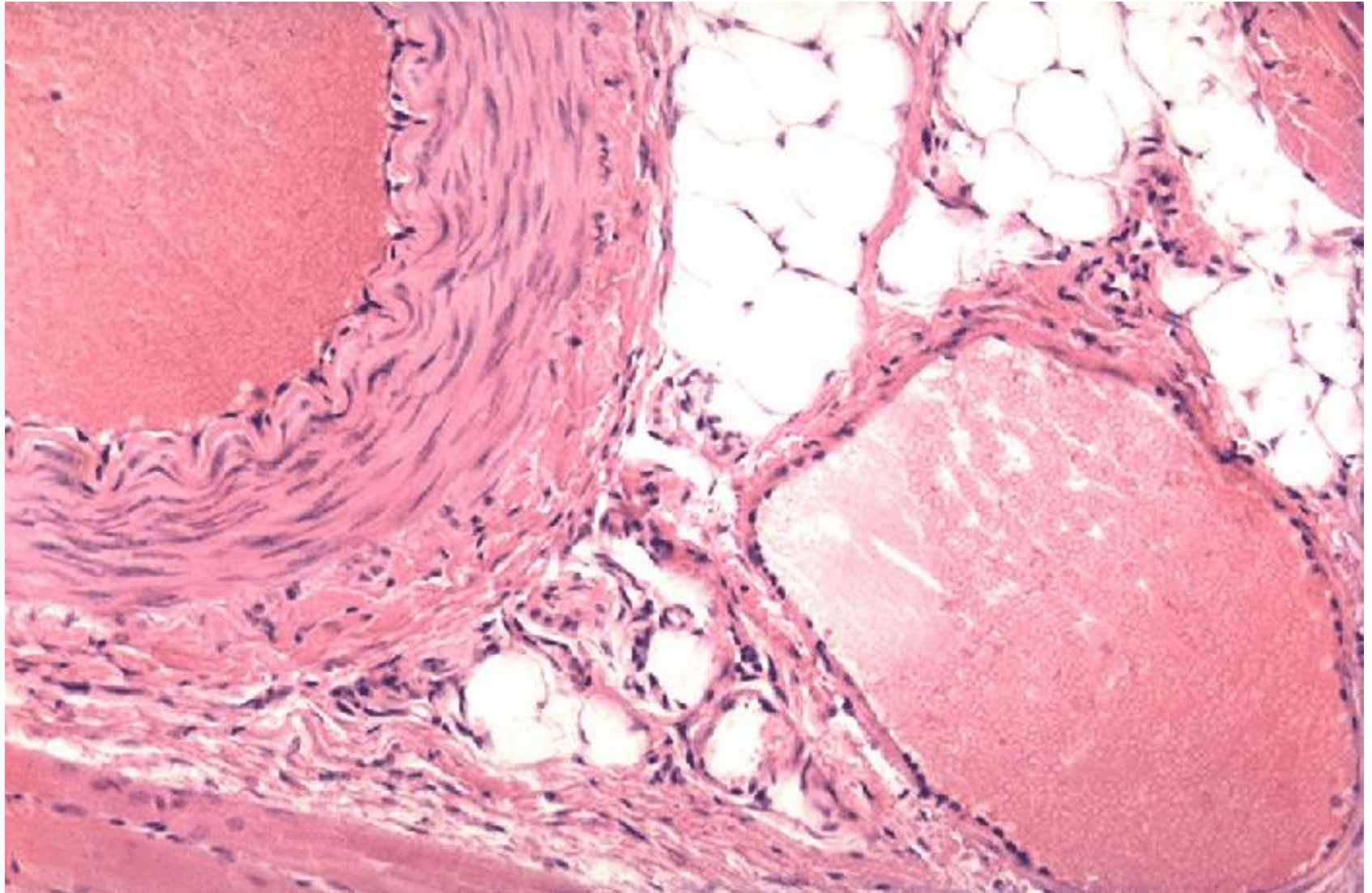
Elastic type artery
(Aorta)
(iron-haematoxylin)

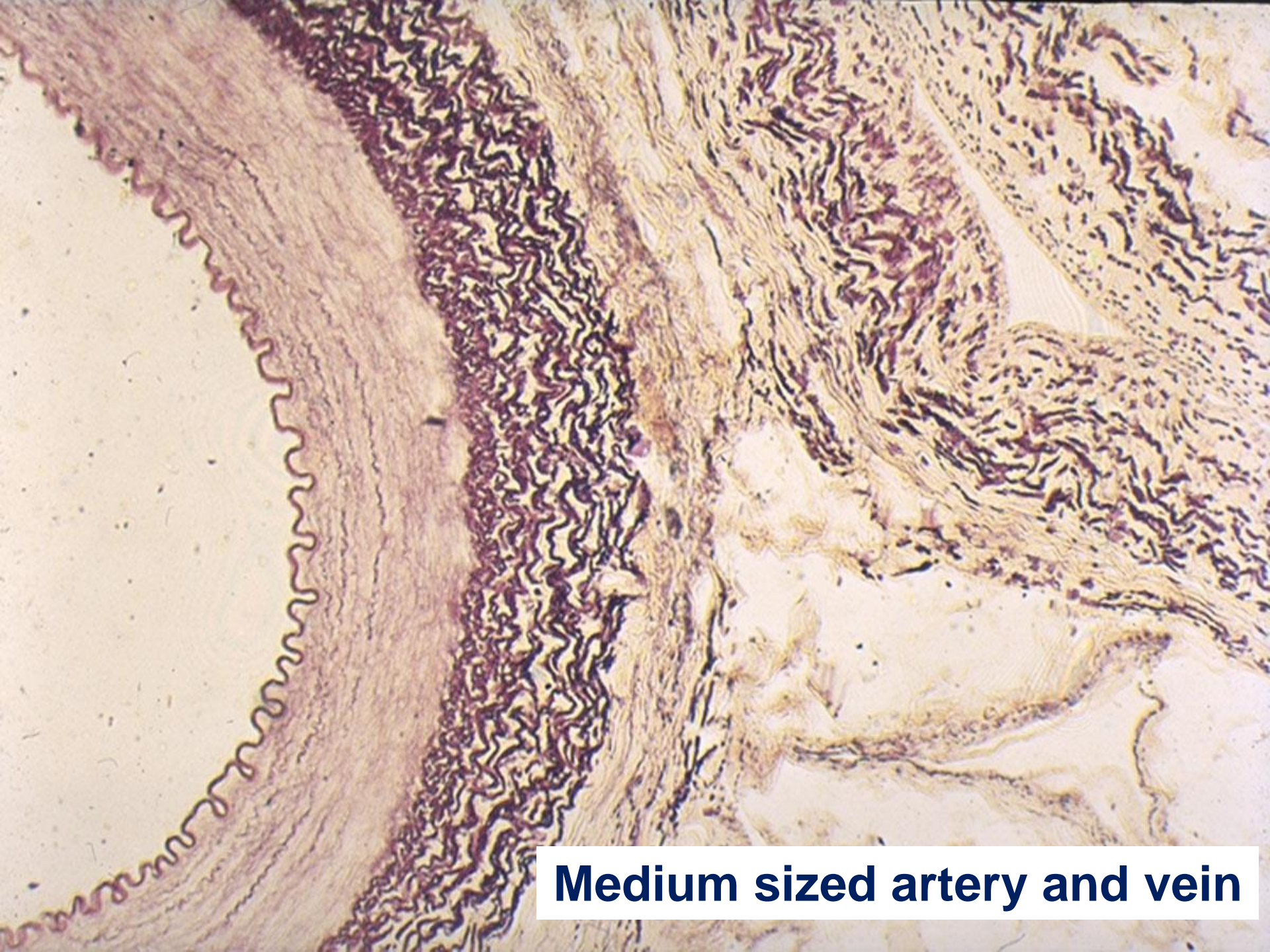


Muscular type artery
(van Gieson staining)

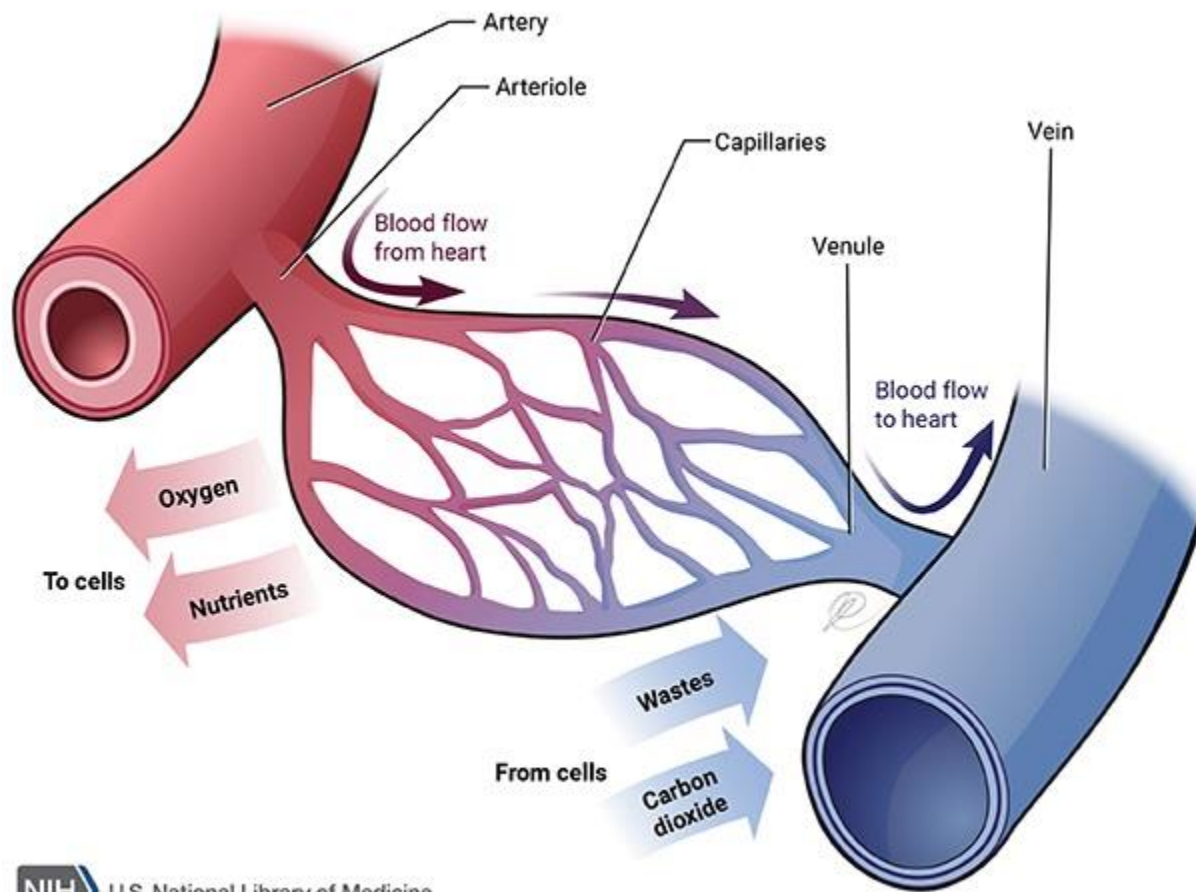
Vasa vasorum

Muskular type artery, vein

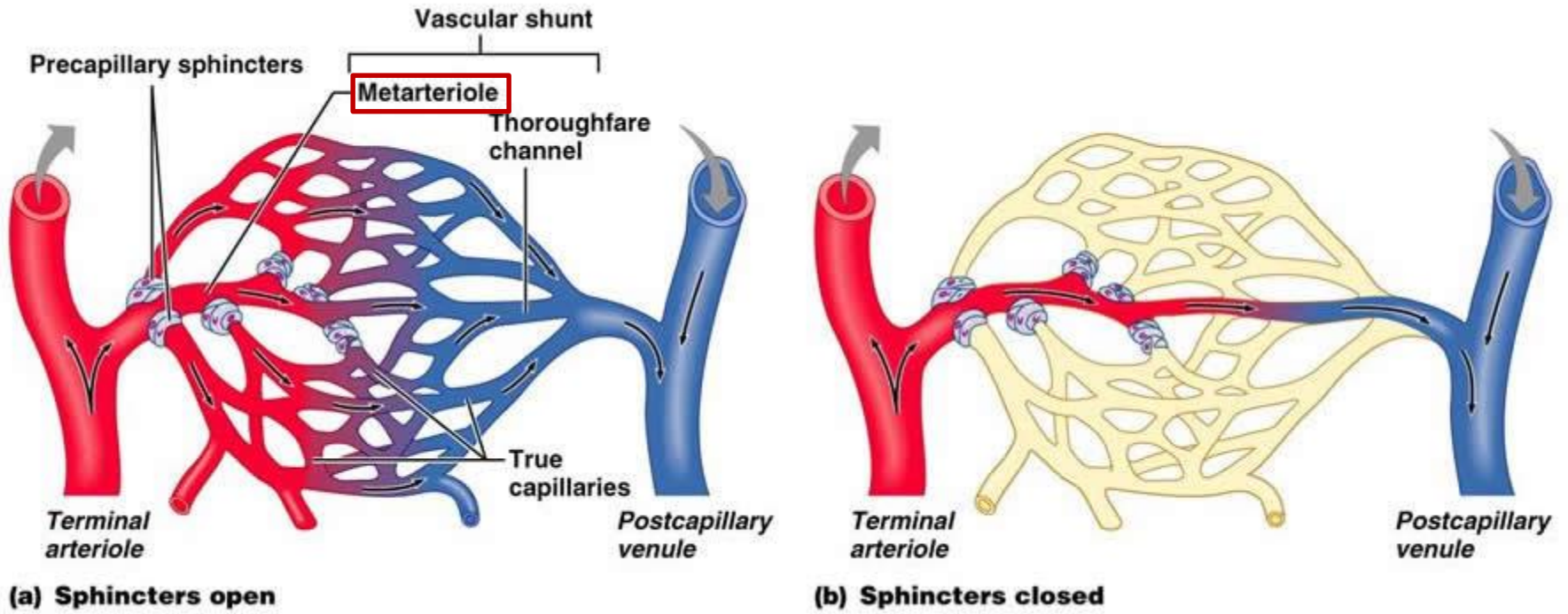




Medium sized artery and vein



arteriole, metarteriole











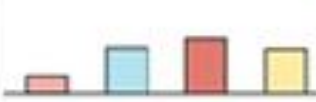

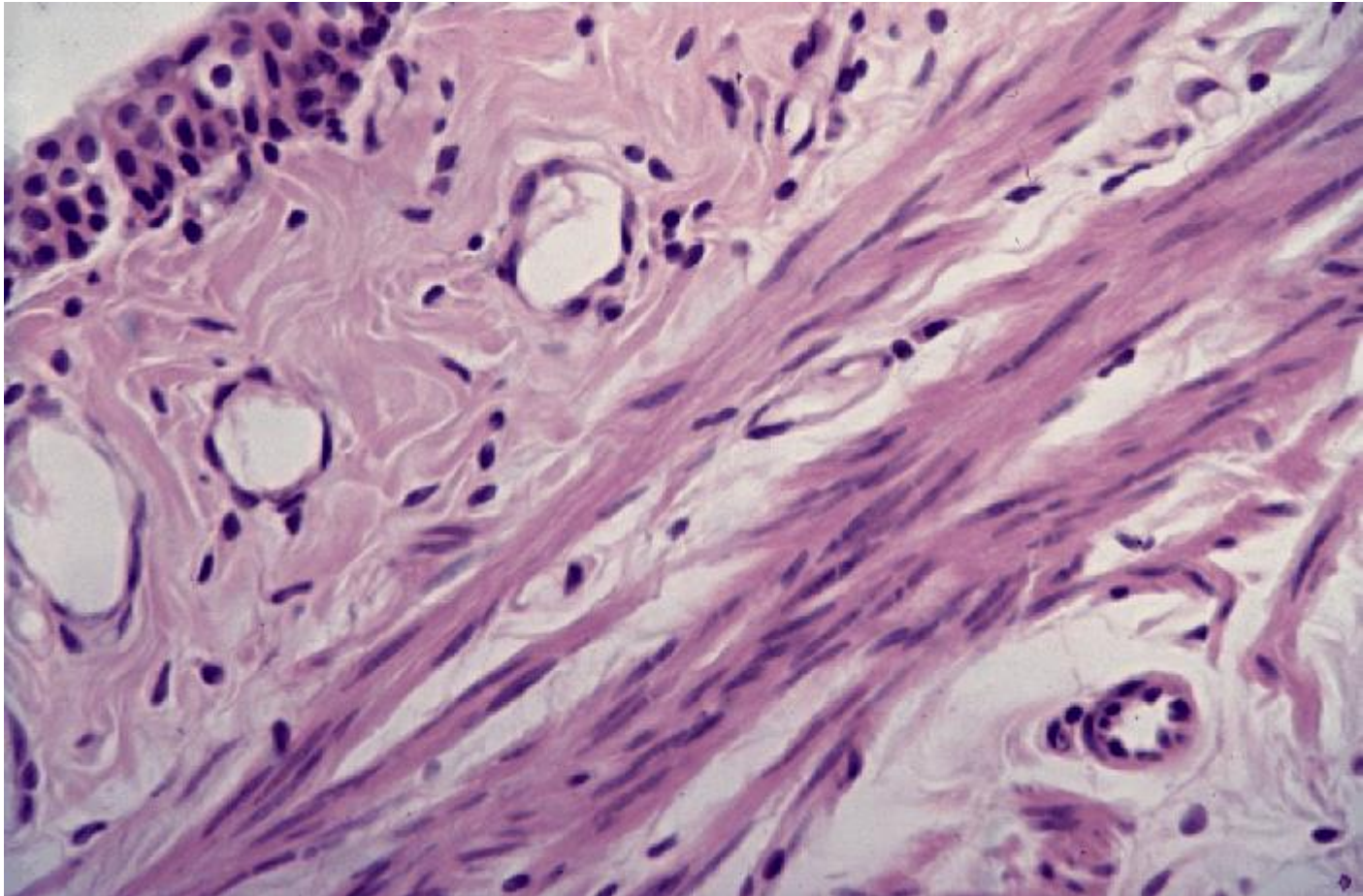
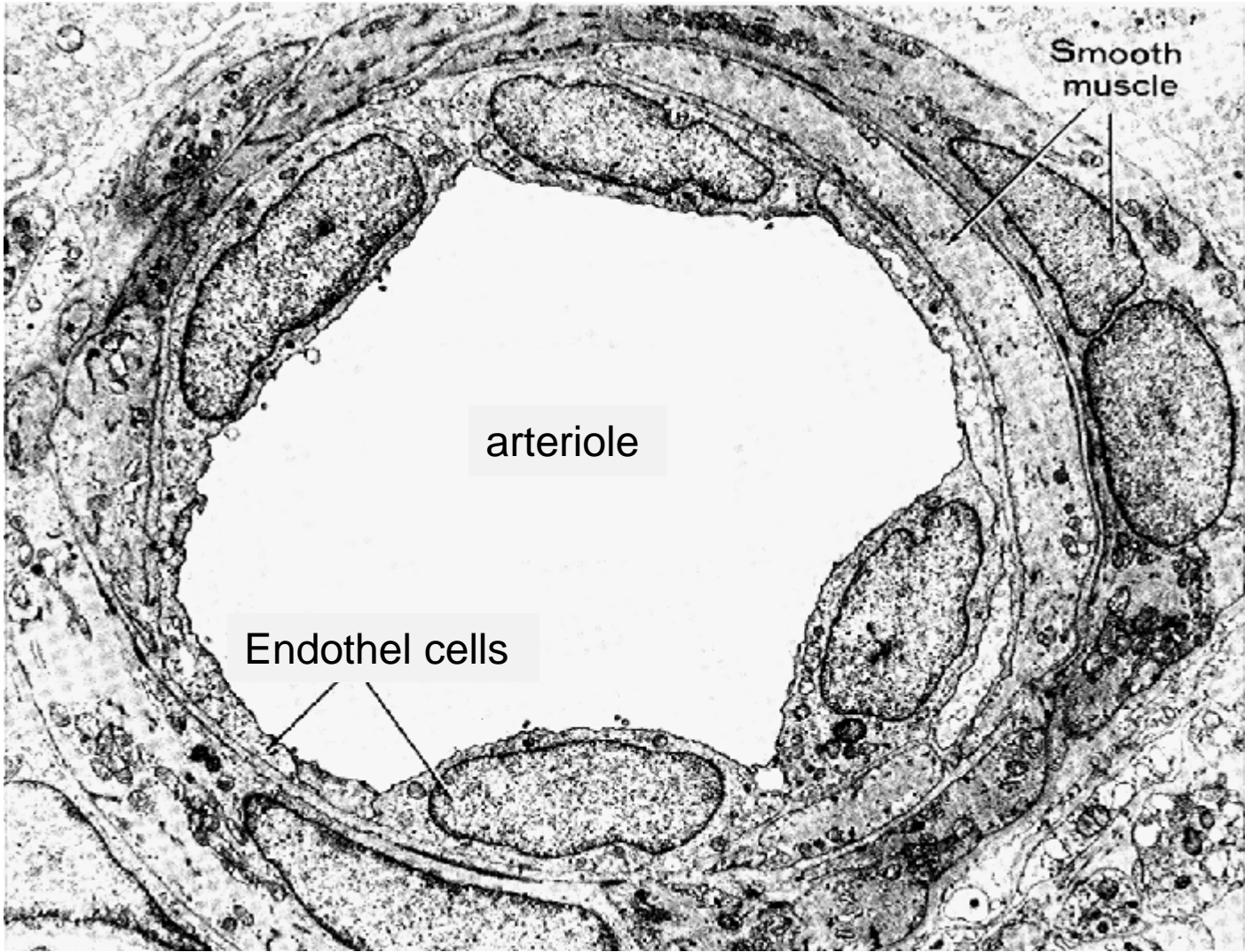
	Mean diameter	Mean wall thickness	Endothelium Elastic tissue Smooth muscle Fibrous tissue	
Artery	4.0 mm	1.0 mm		
Arteriole	30.0 μm	6.0 μm		
Capillary	8.0 μm	0.5 μm		
Venule	20.0 μm	1.0 μm		
Vein	5.0 mm	0.5 mm		

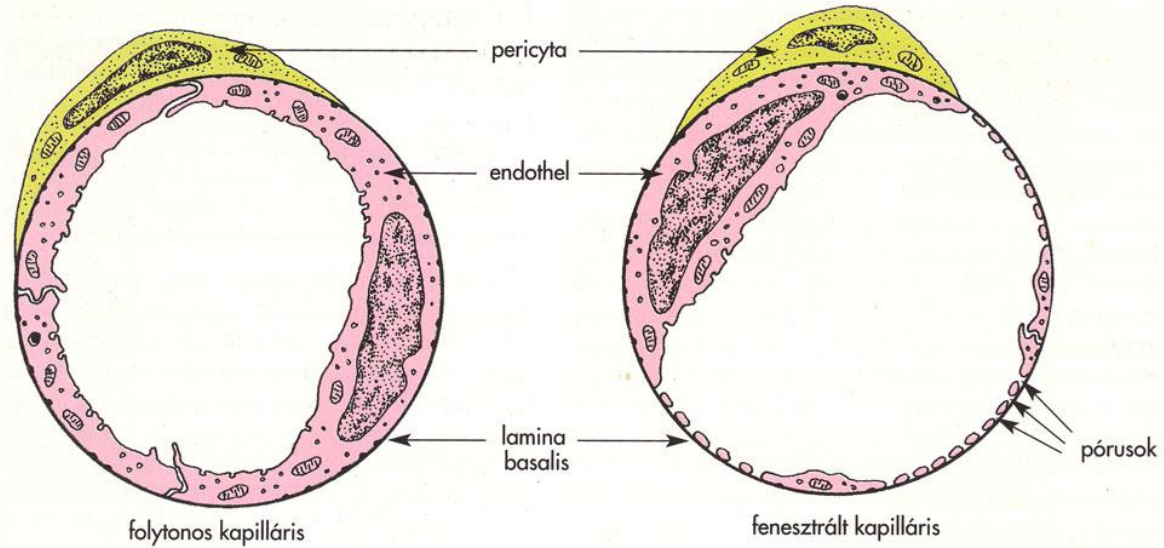
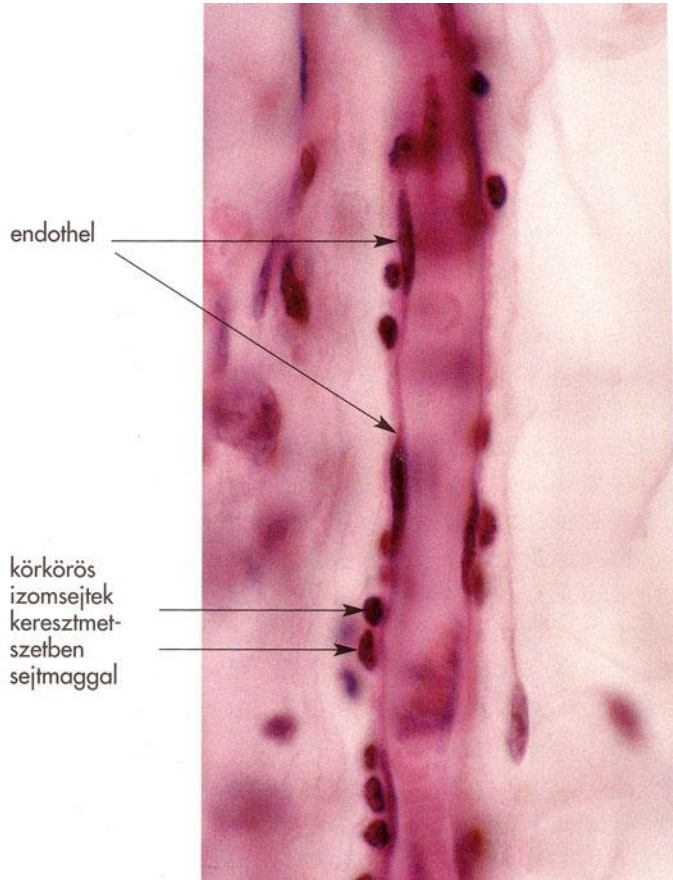
Fig. 15.2





Capillaries

4-15 μm



Folytonos és fenesztrált kapilláris keresztmetszetének vázlatos képe.

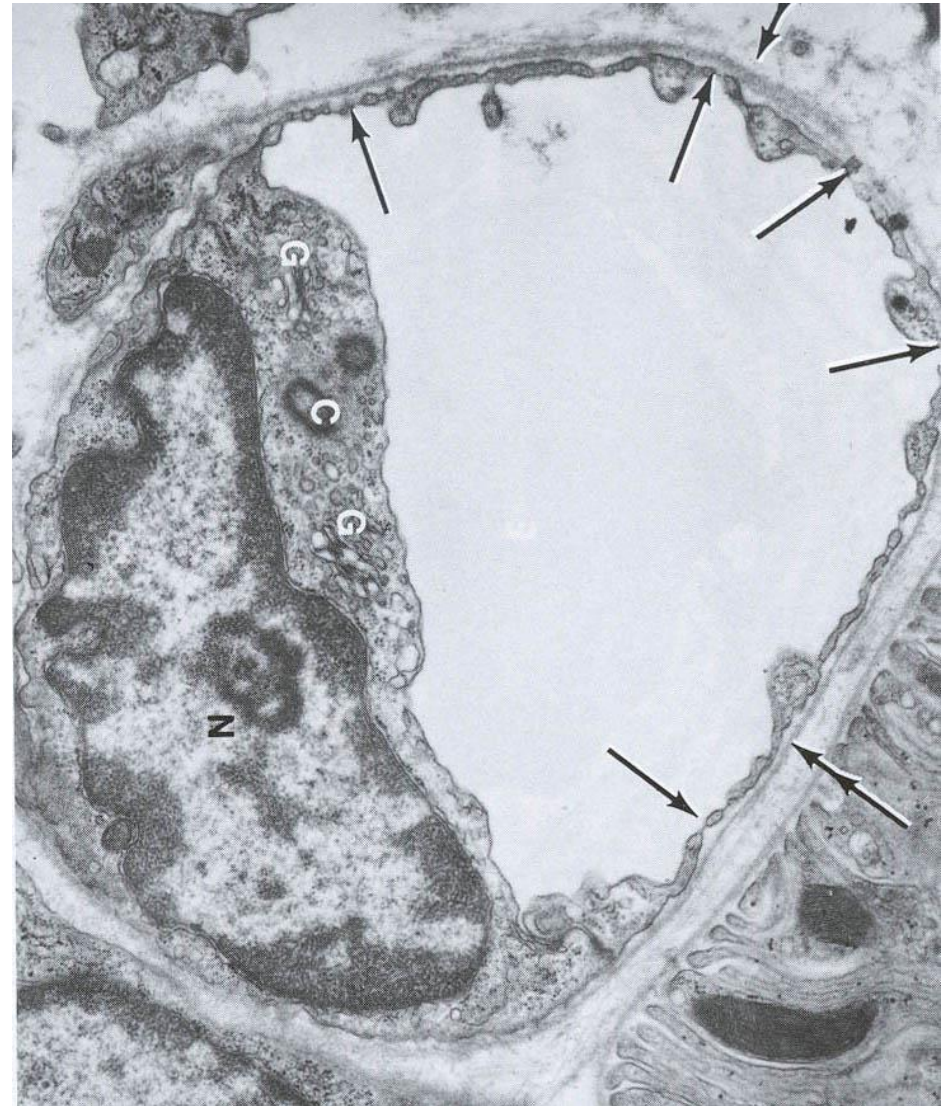
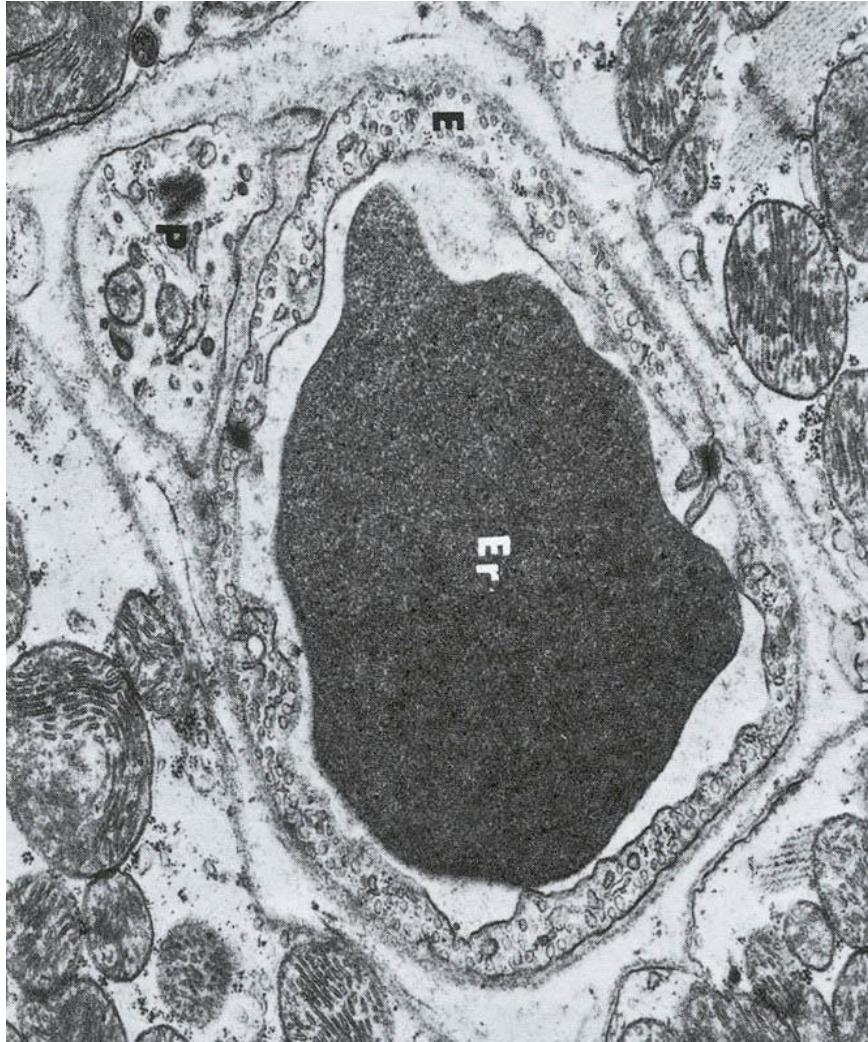
Layers:

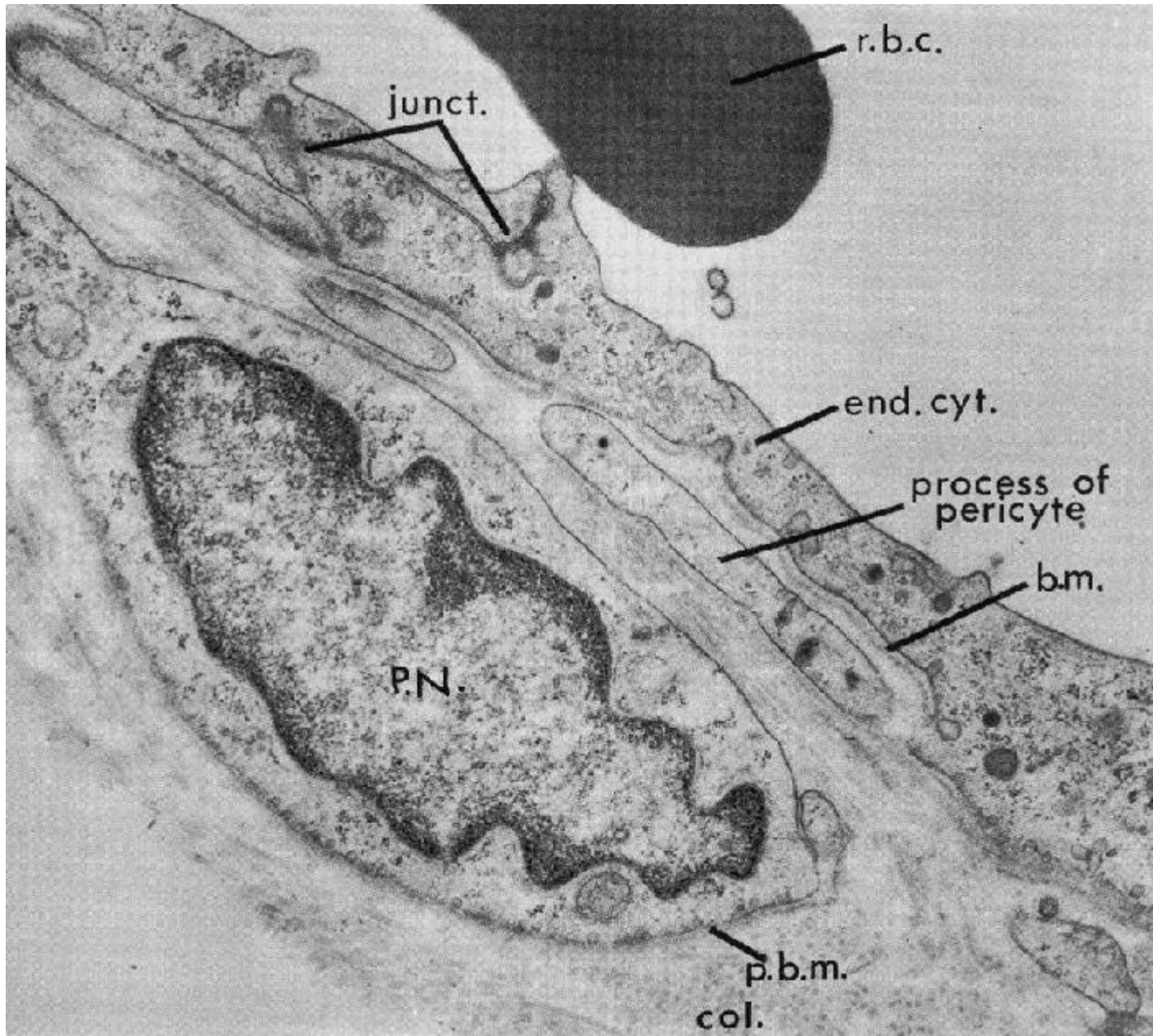
Endothel cell

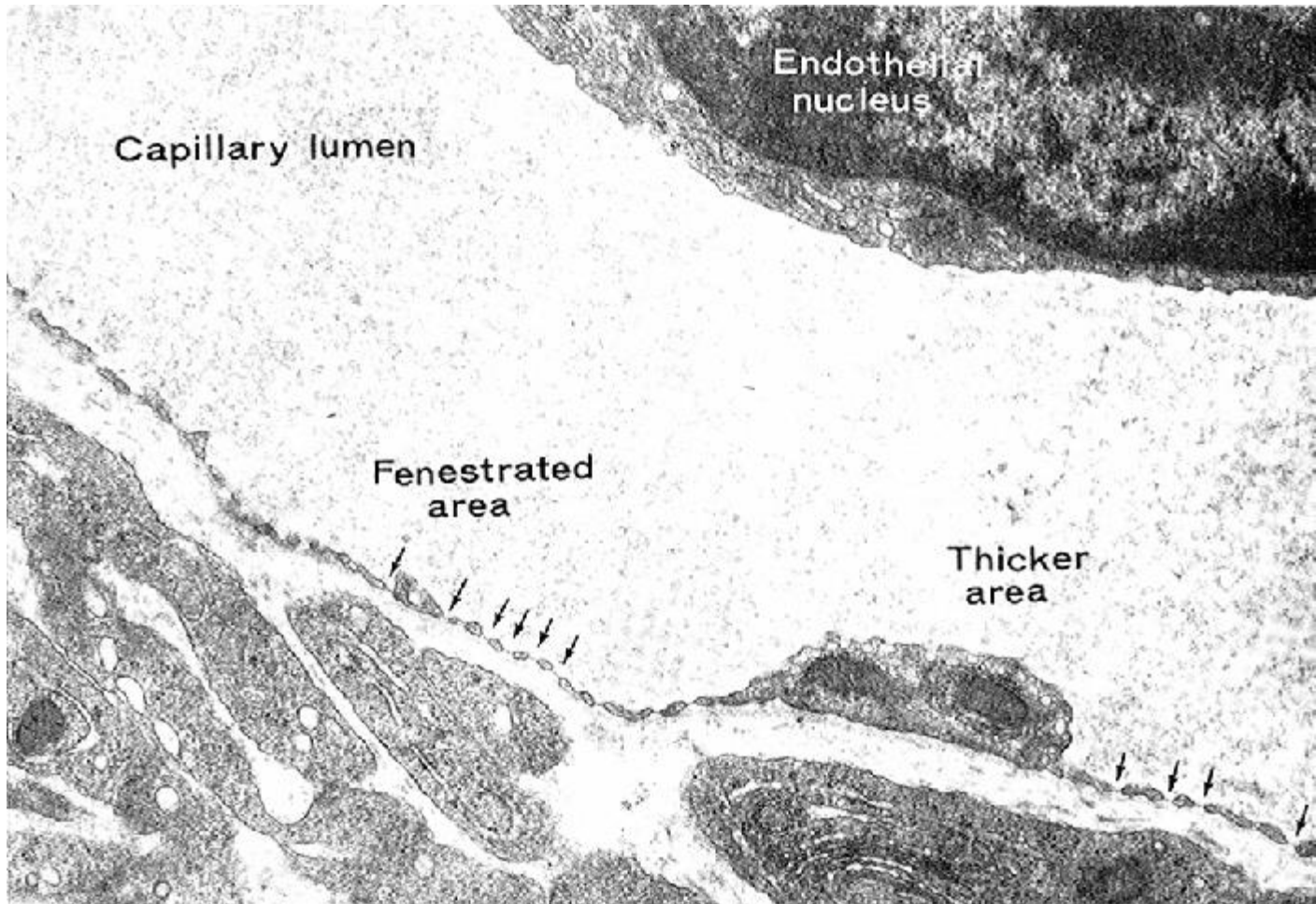
Lamina basalis, reticular fibers

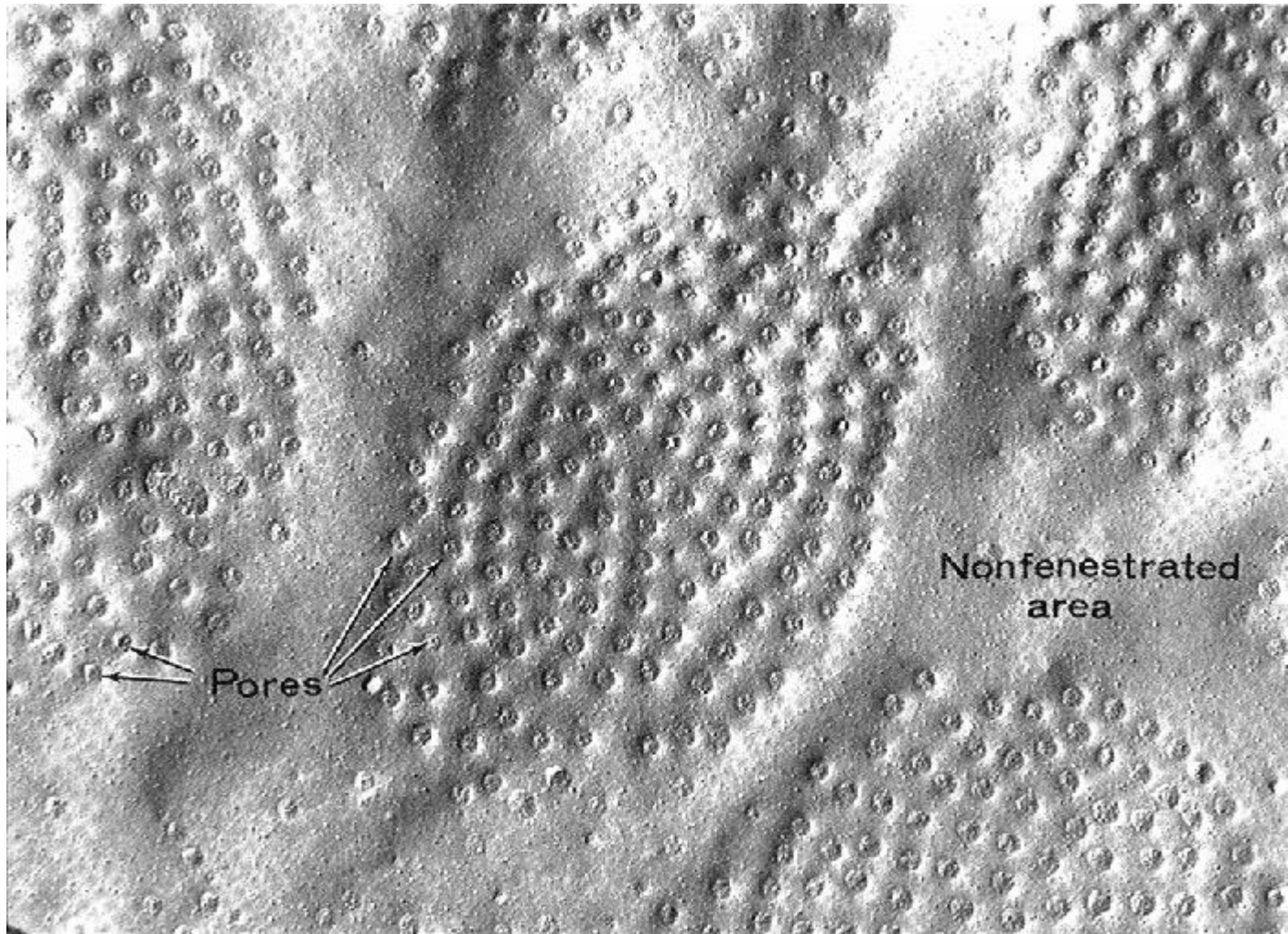
Pericyte (in lamina basalis)

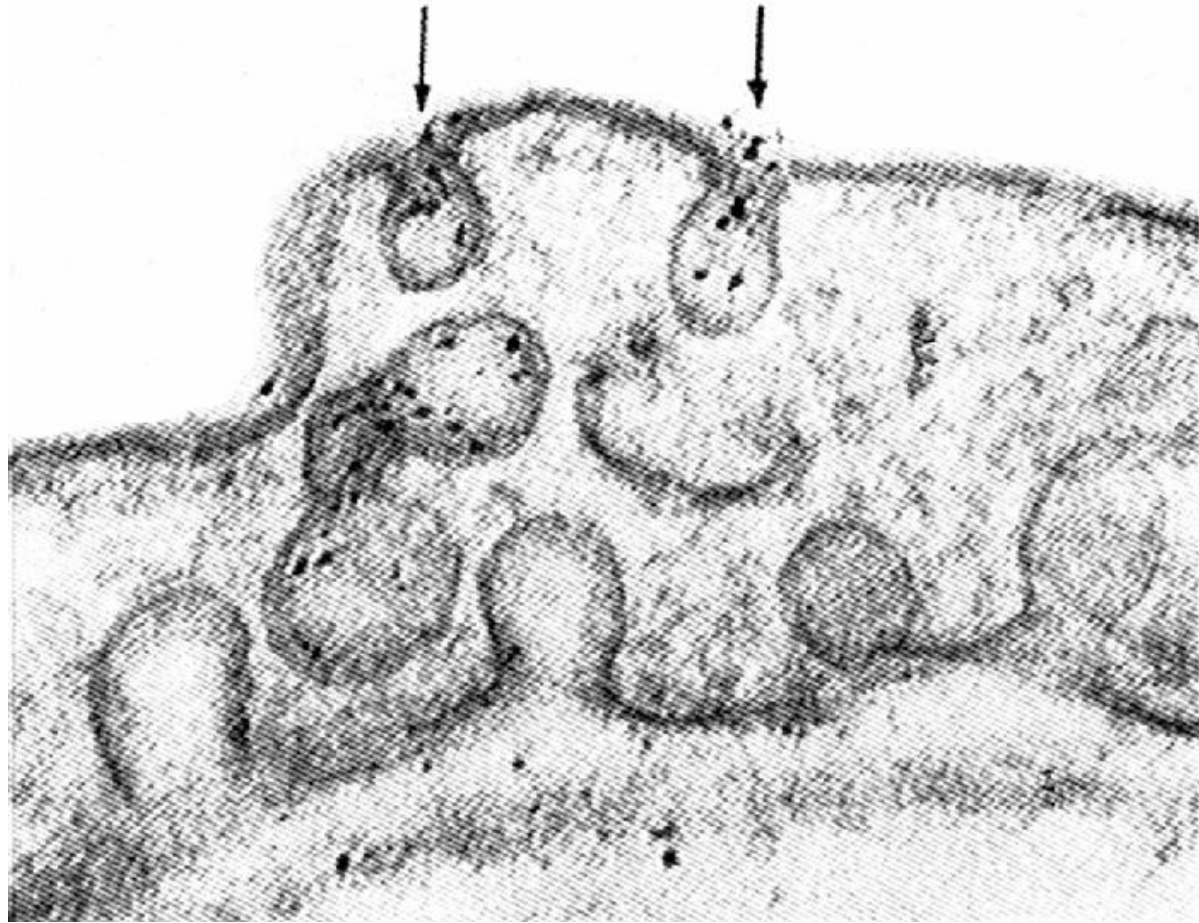
Capillaries



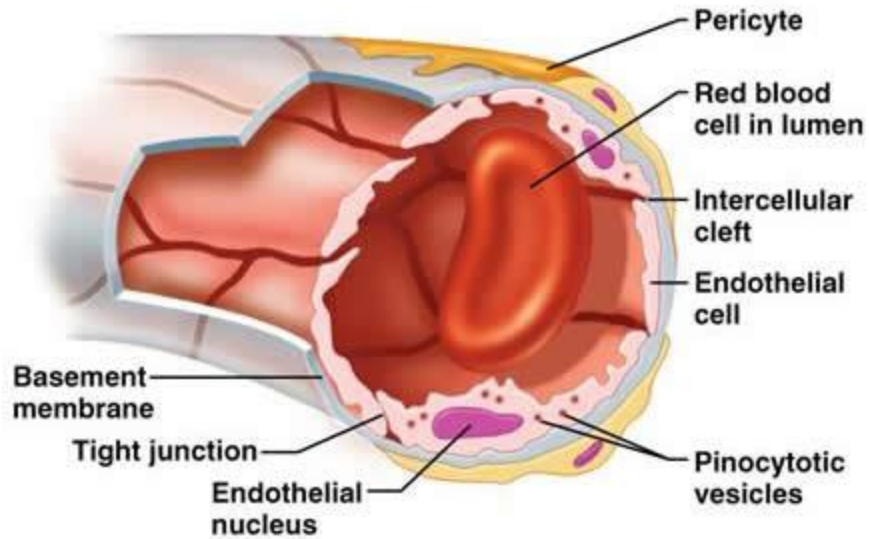






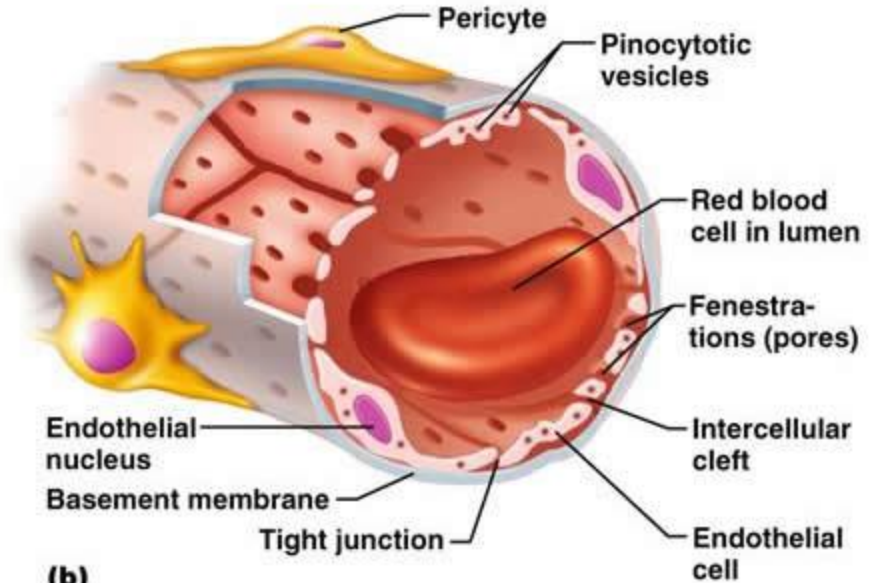


Continuous capillaries



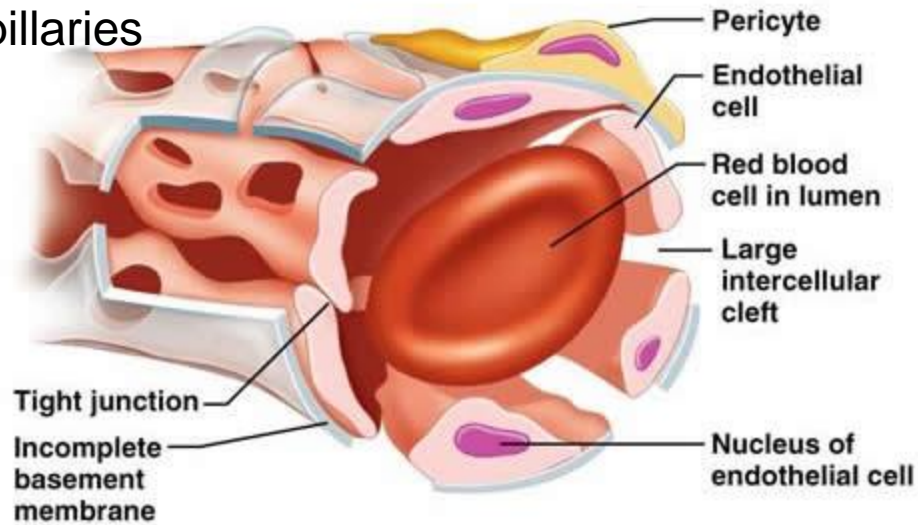
(a)

Fenestrated capillaries



(b)

Sinusoidal capillaries



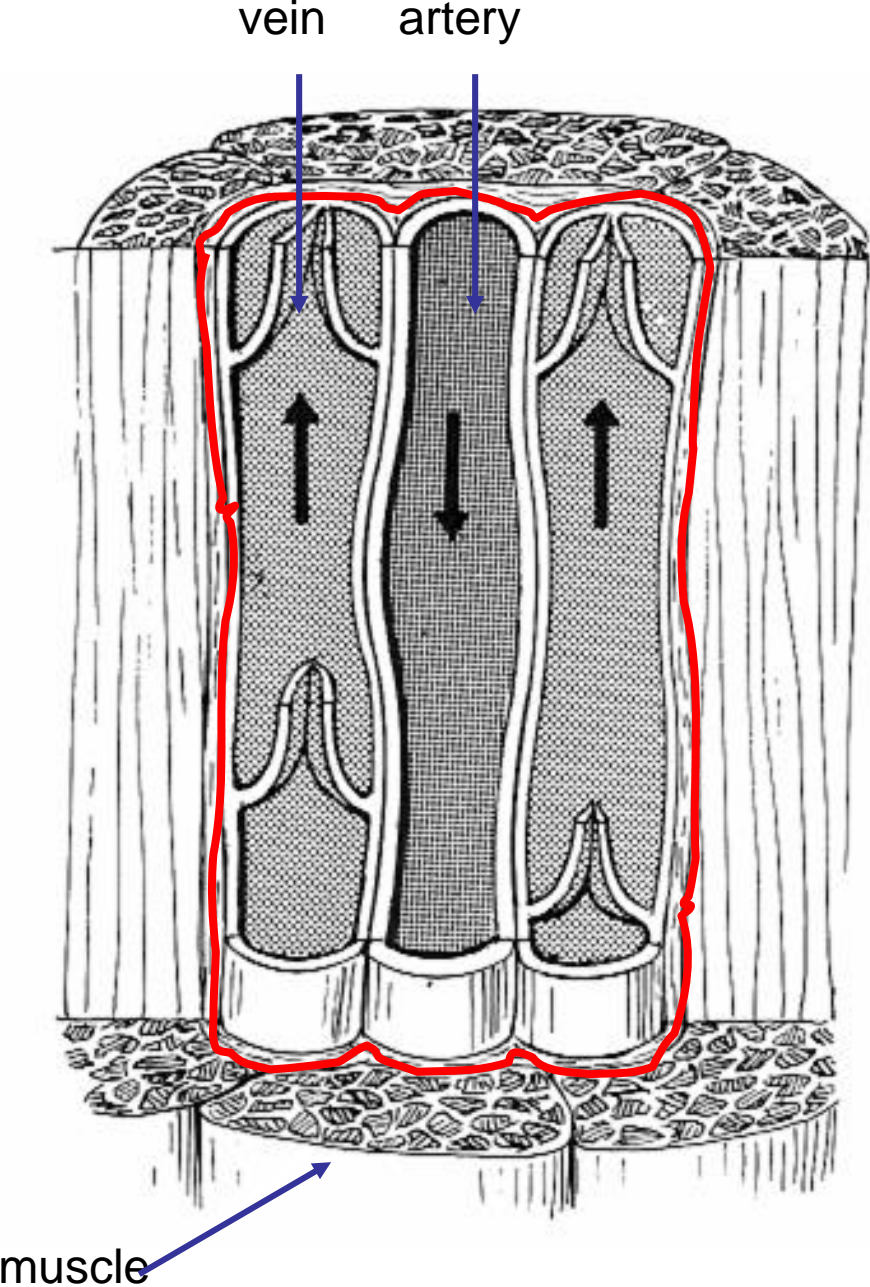
(c)

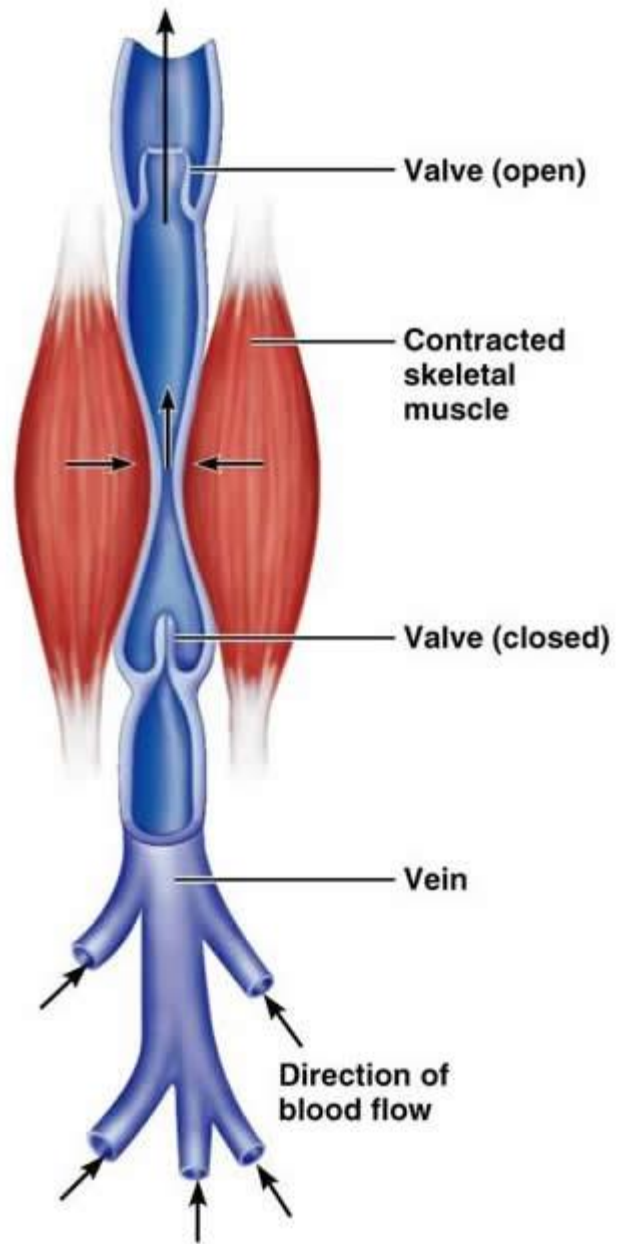
Liver sinusoid

10 μ m

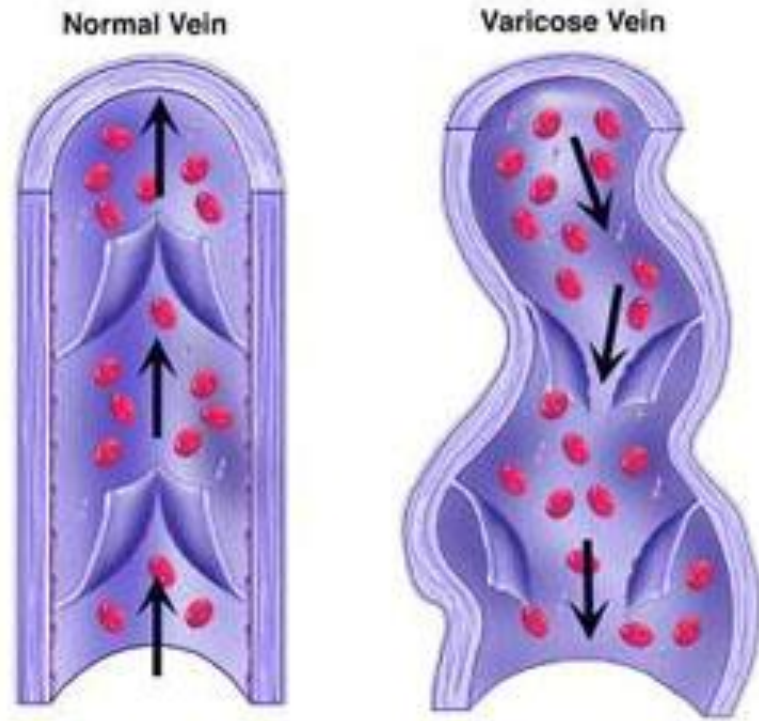
A light micrograph of liver tissue stained with hematoxylin and eosin (H&E). The image shows a dense field of hepatocytes with prominent, dark-stained nuclei. Interspersed among the hepatocytes are liver sinusoids, which are small, irregular spaces containing blood. The sinusoids are lined by a single layer of endothelial cells, which appear as thin, pale lines. The overall architecture is characteristic of the liver's lobular structure. A scale bar in the bottom right corner indicates a length of 10 micrometers.

Connective tissue sheath

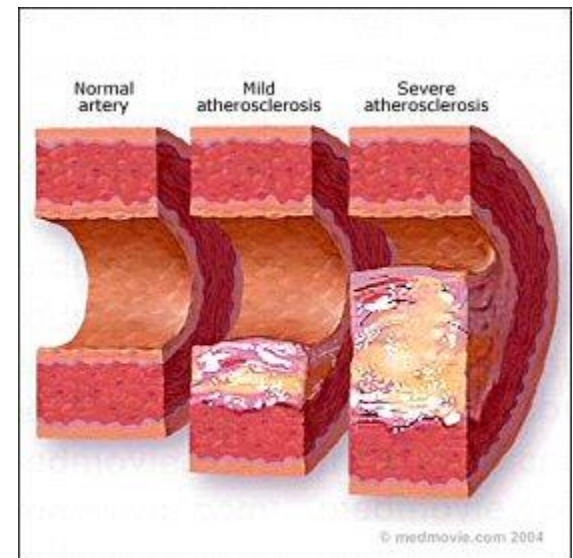
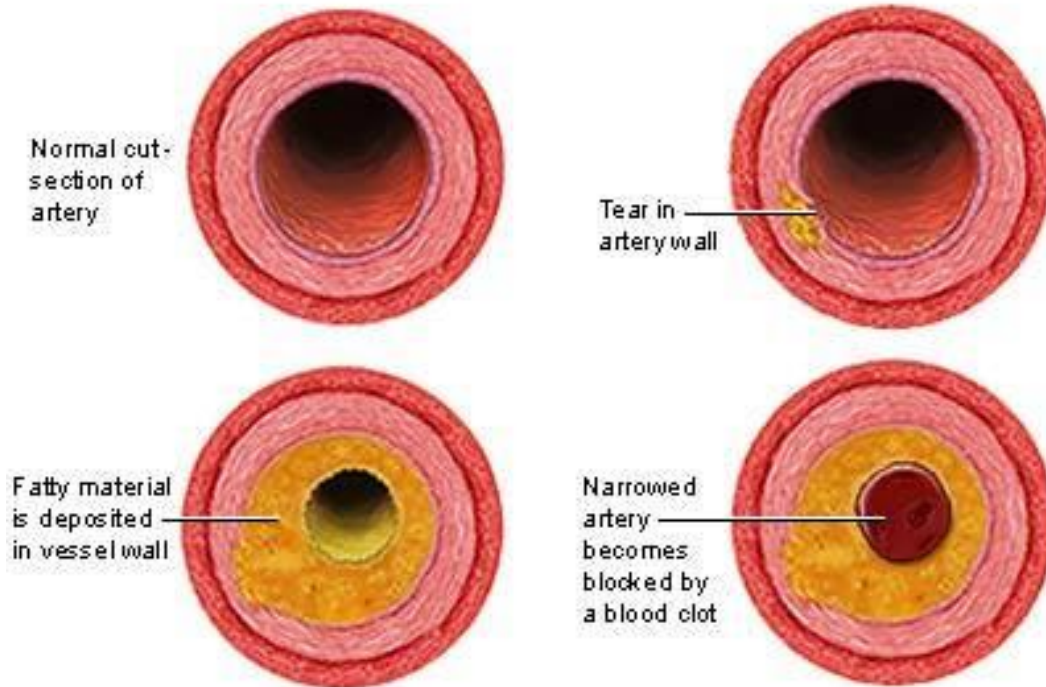




Varicose vein

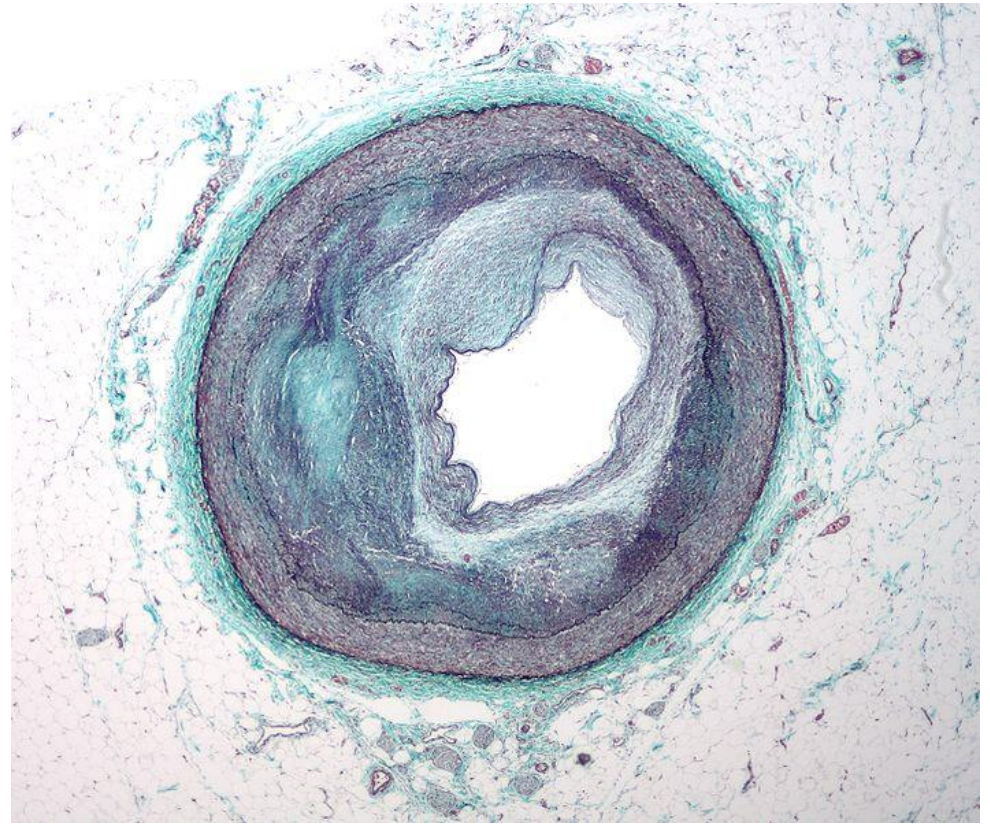


Atherosclerosis





aorta

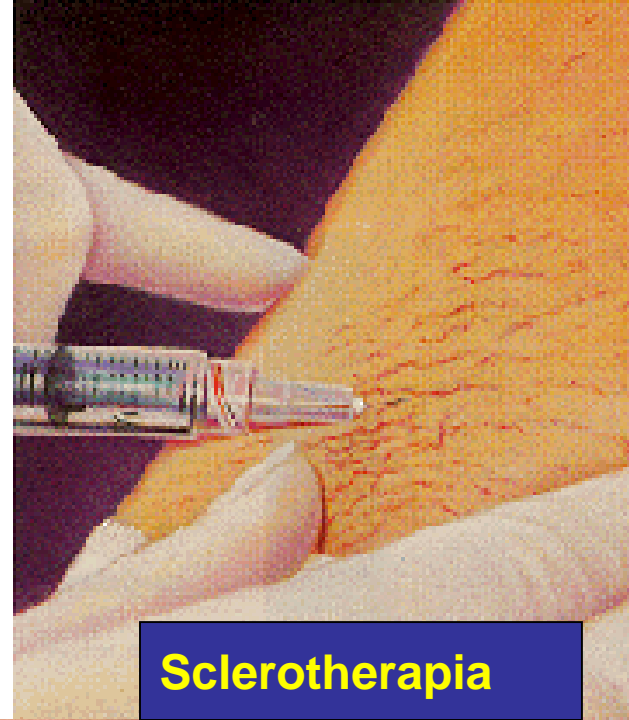


wikipedia.org

Telangiectasia



Telangiectasia



Sclerotherapy

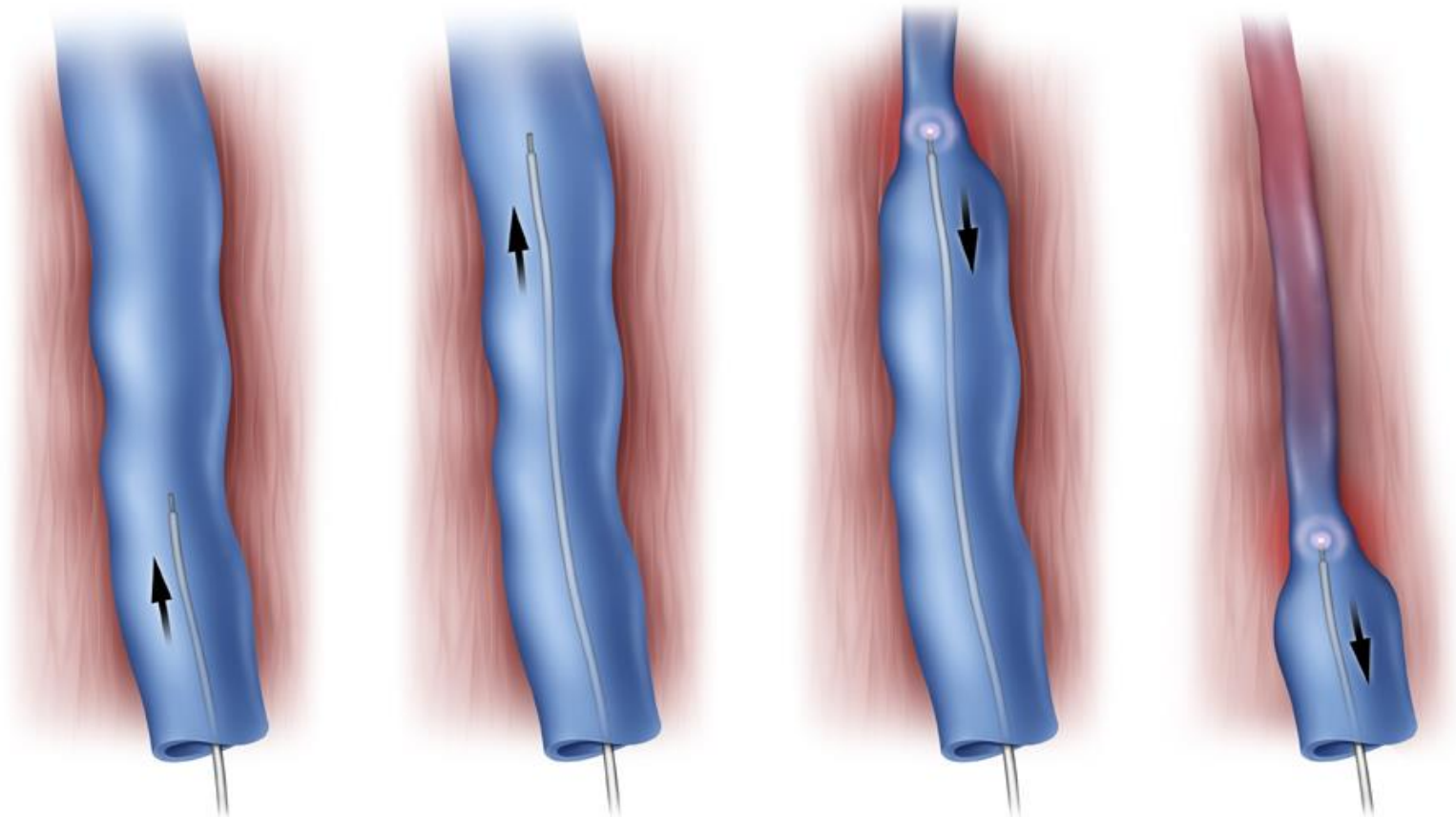


Sclerotherapy



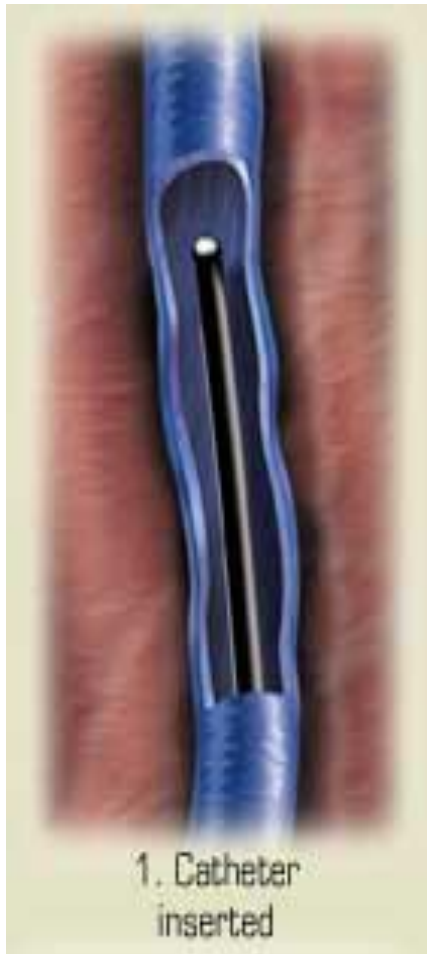
LES-Vein©

(A v. saphena magna laseres kezelése)



(Laser Endovenous Saphenous Vein;
<http://www.varicoseveindoctors.com/>)

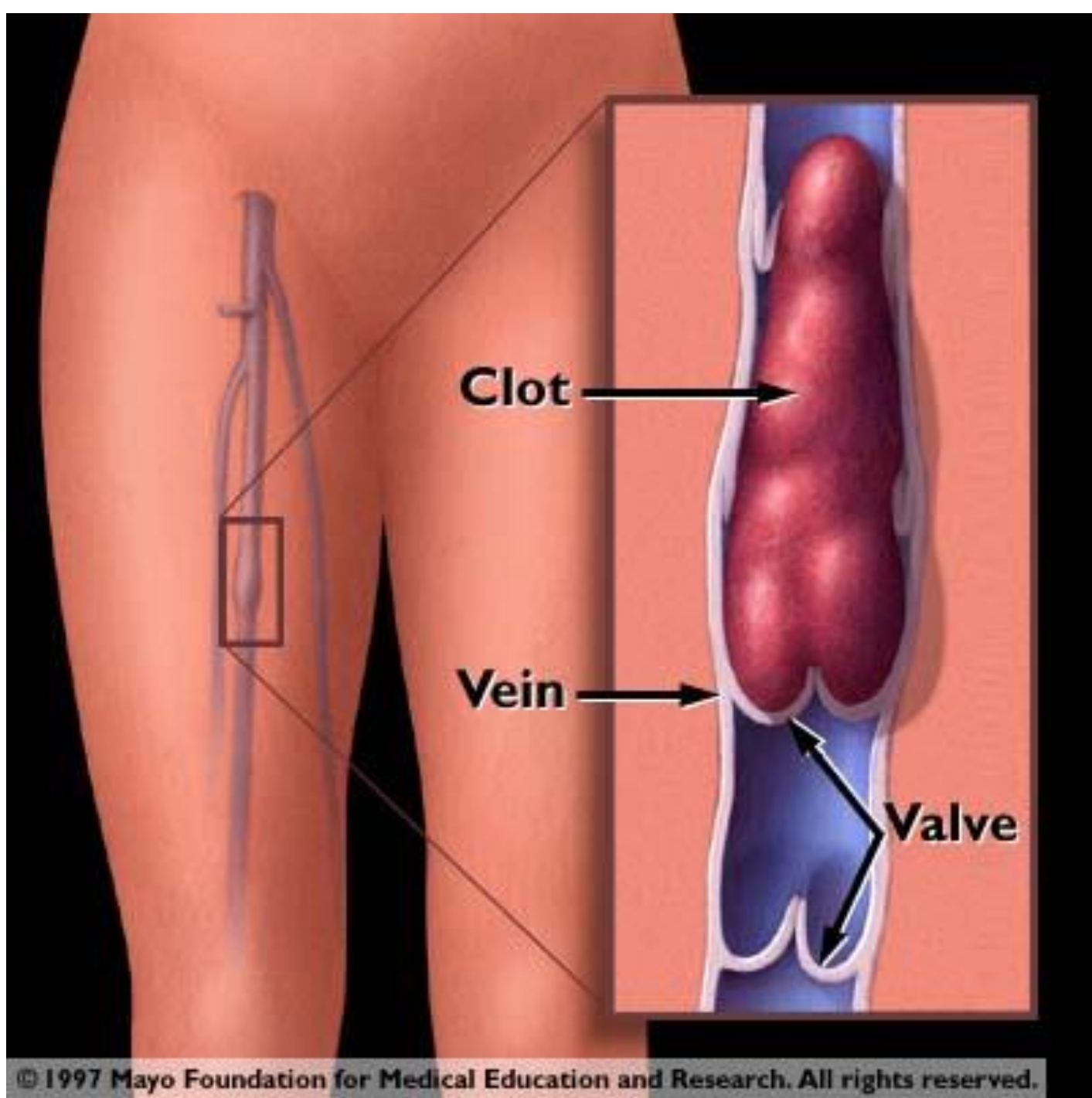
Radiofrequency Occlusion



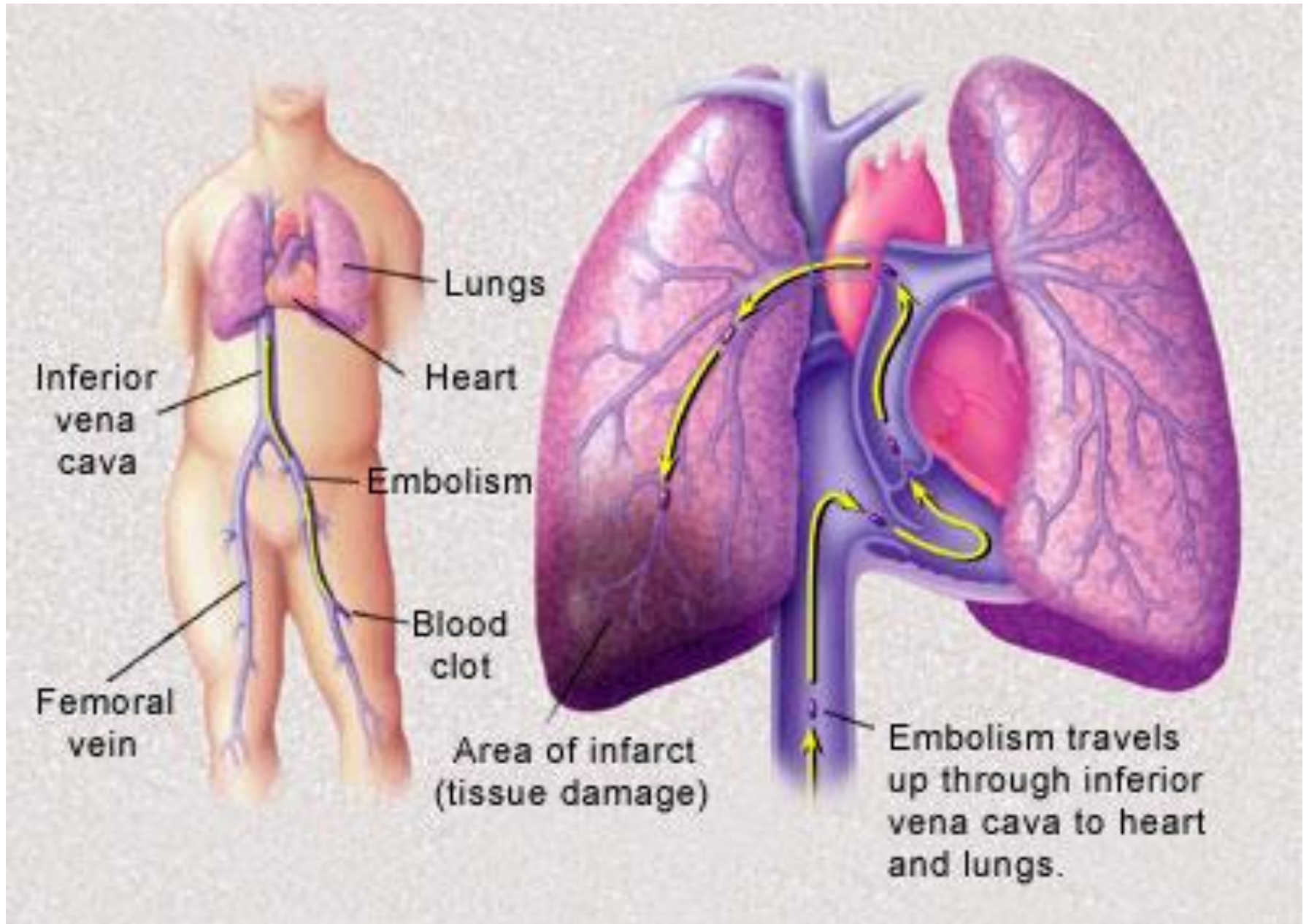
Phlebectomia



Trombus



Embolus



Catheter introduced into jugular vein

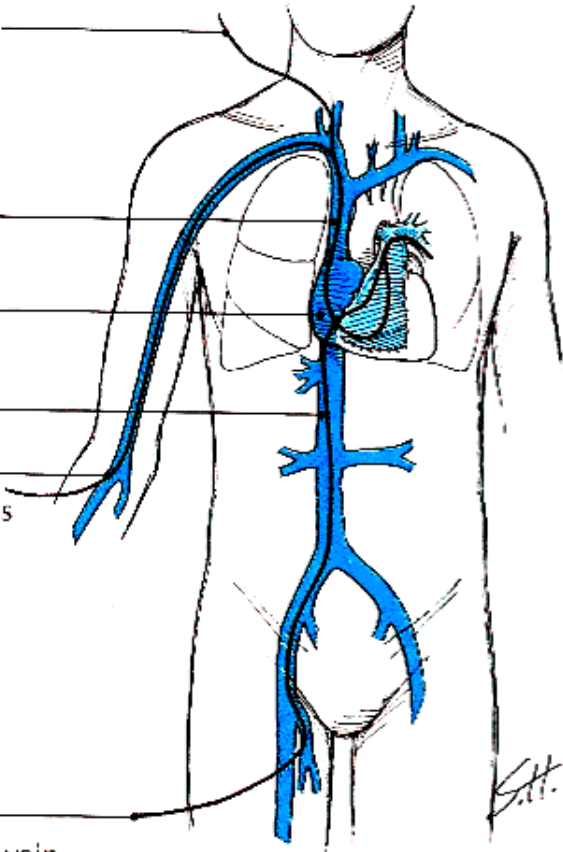
Superior vena cava

Right atrium

Inferior vena cava

Catheter introduced into basilic vein; goes into subclavian vein

Catheter introduced into great saphenous vein



Catheter introduced into brachial or femoral artery

Aortic arch

Left ventricle

Descending aorta

