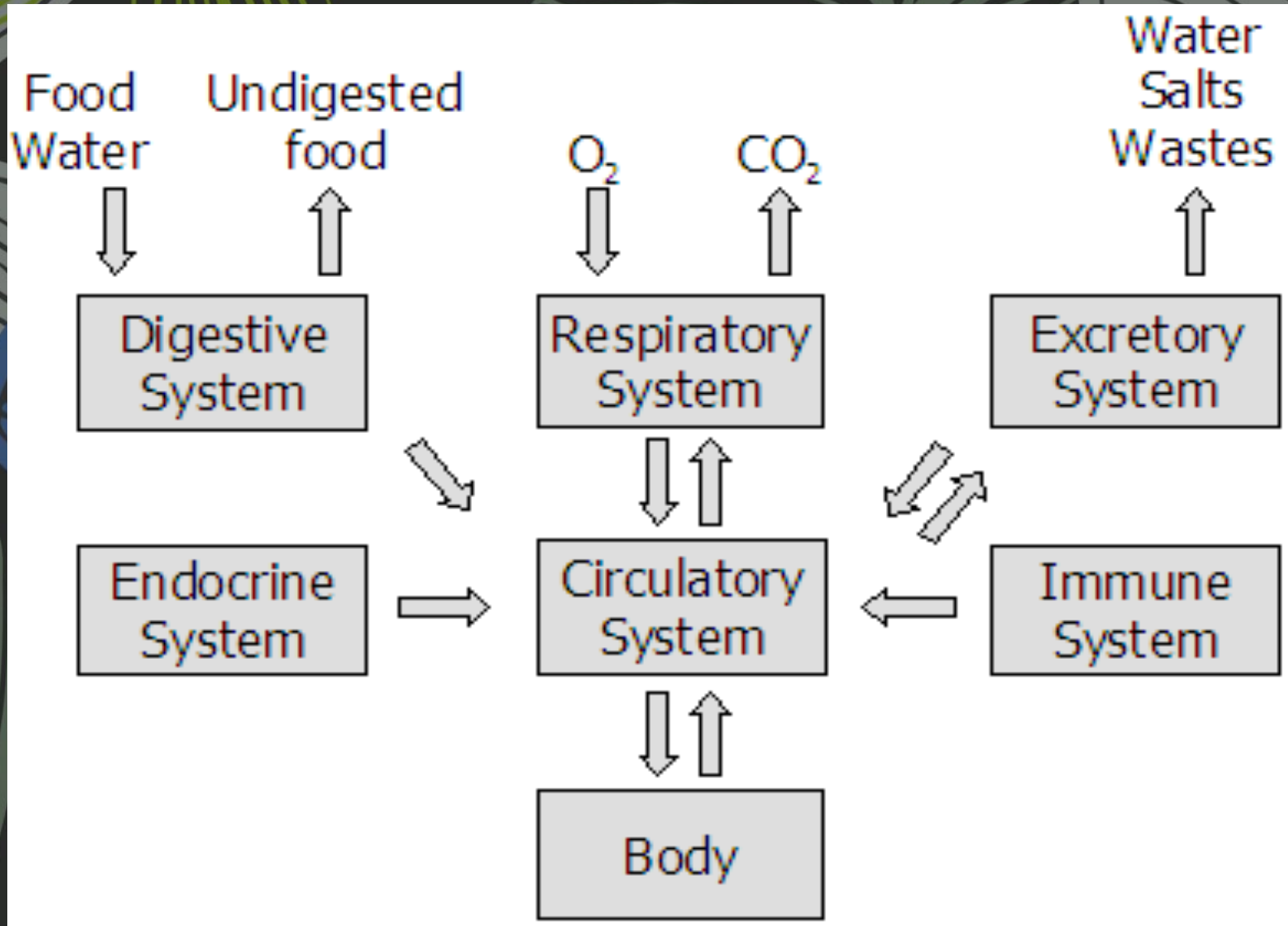


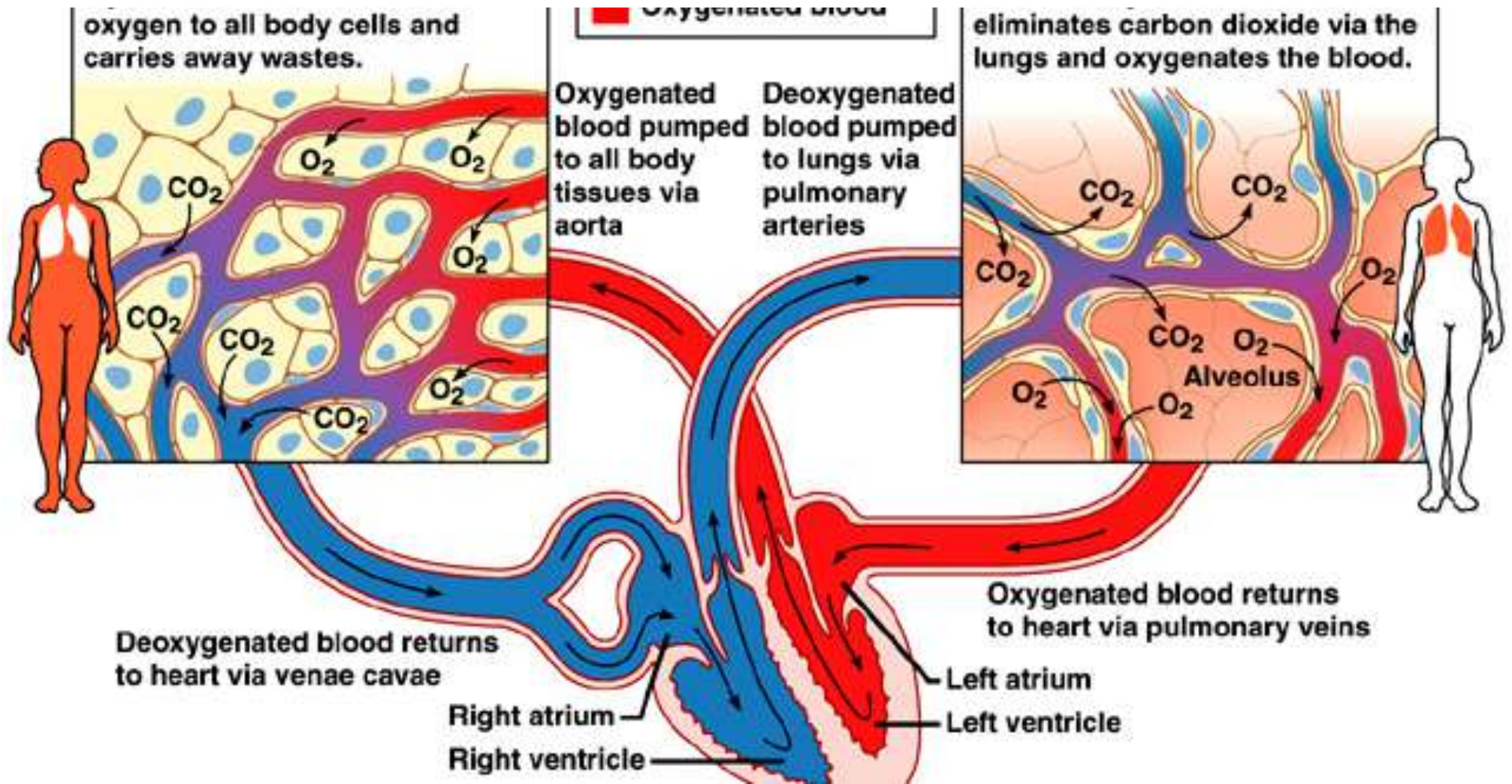
# PERAN SISTEM KARDIOVASKULAR DALAM HOMEOSTASIS

Denny Agustiningsih

# FUNGSI SISTEM KARDIOVASKULAR







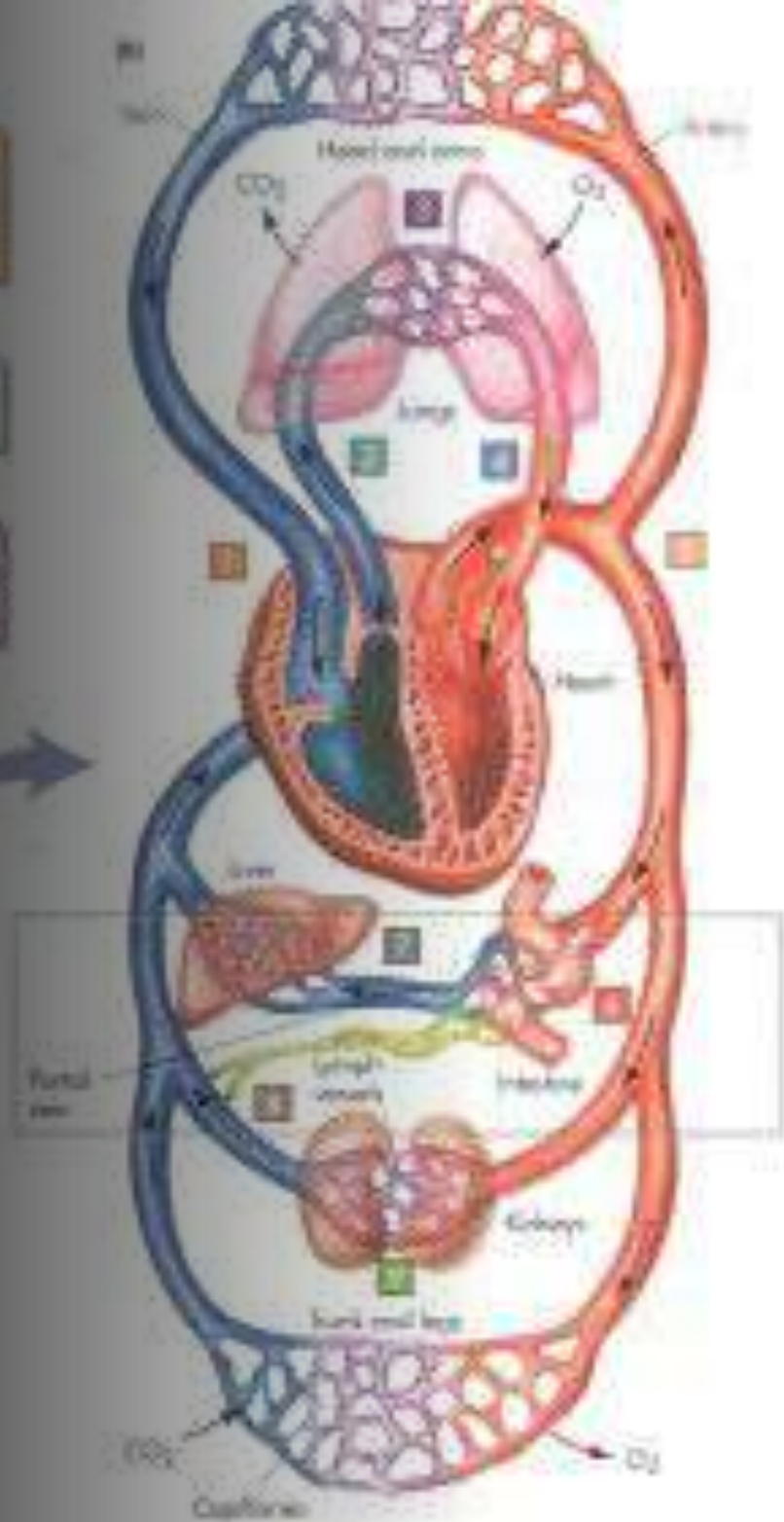
# SIRKULASI SISTEMIK DAN PULMONAL

# SIRKULASI ORGAN KHUSUS

Deoxygenated blood from the body enters the right atrium of the heart through superior and inferior vena cava. The blood has already circulated to the body cells.

Blood is pumped out of right ventricle of the heart to lungs.

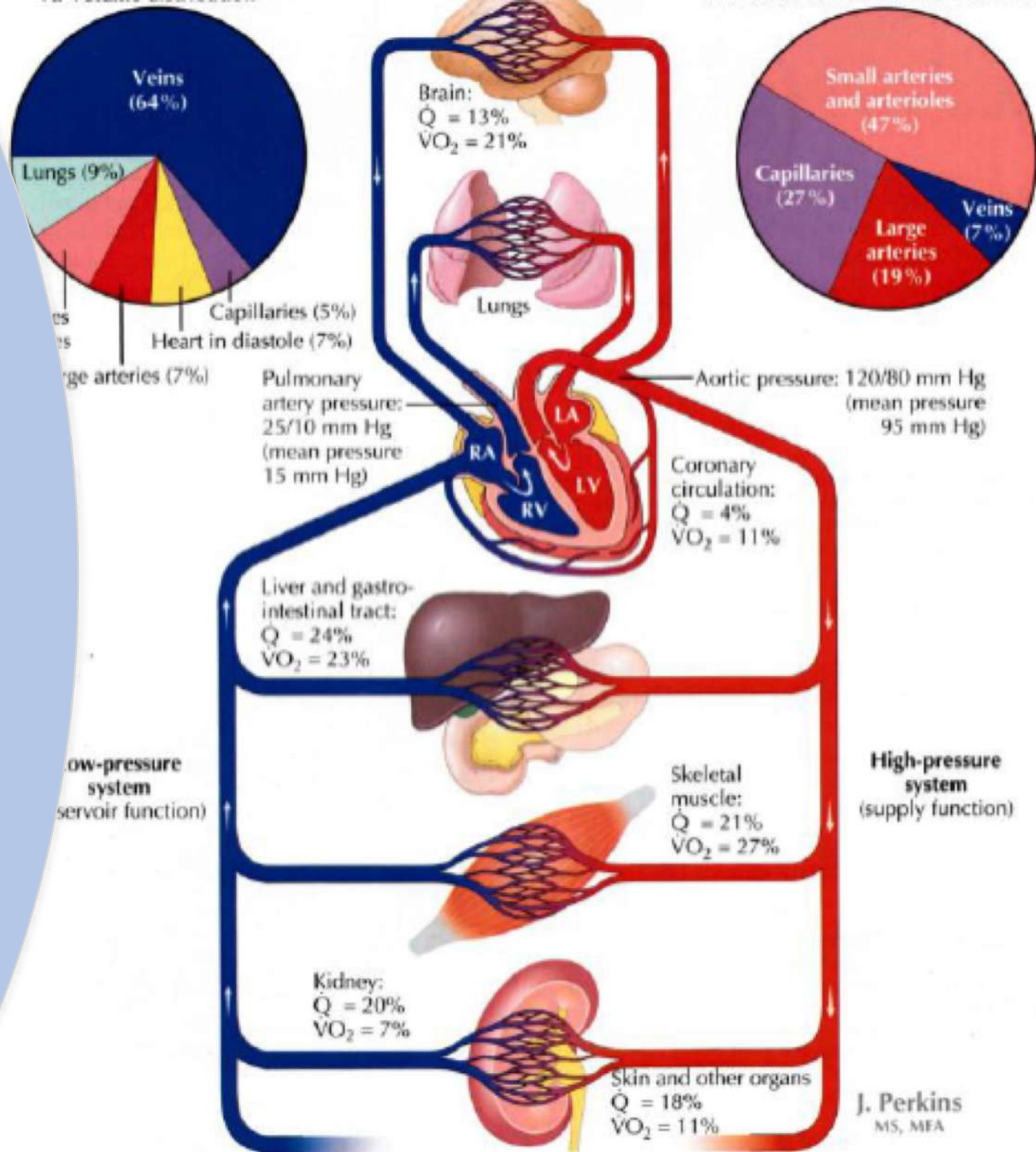
Gas exchange takes place in the lungs. Blood picks up oxygen and releases carbon dioxide.

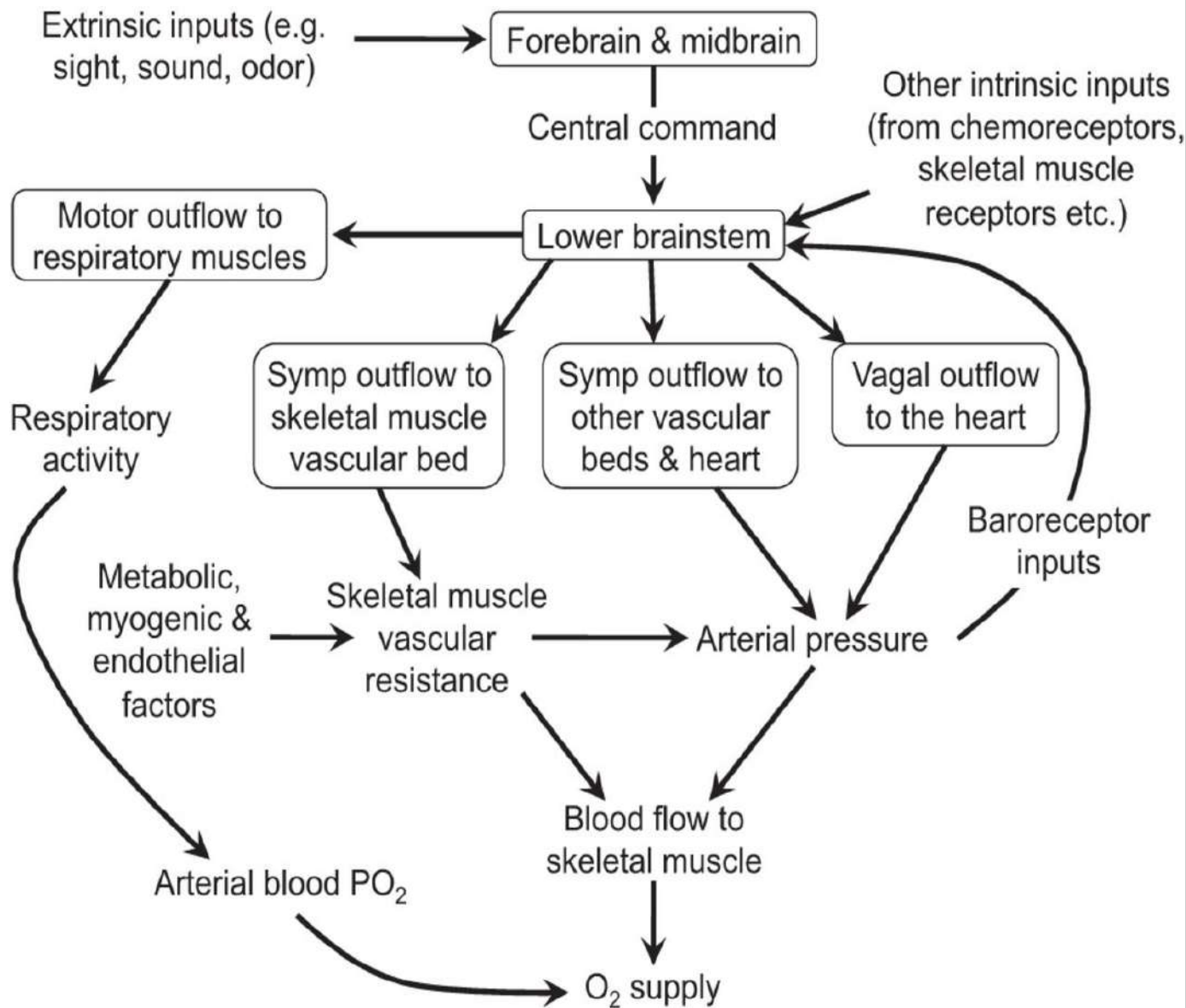


- 1. Superior vena cava
- 2. Inferior vena cava
- 3. Right atrium
- 4. Right ventricle
- 5. Pulmonary artery
- 6. Pulmonary vein
- 7. Left atrium
- 8. Left ventricle
- 9. Aorta
- 10. Superior mesenteric artery
- 11. Inferior mesenteric artery
- 12. Renal artery
- 13. Renal vein
- 14. Common iliac artery
- 15. Common iliac vein
- 16. External iliac artery
- 17. External iliac vein
- 18. Internal iliac artery
- 19. Internal iliac vein
- 20. Femoral artery
- 21. Femoral vein
- 22. Popliteal artery
- 23. Popliteal vein
- 24. Tibial artery
- 25. Tibial vein
- 26. Dorsal venous sinus
- 27. Lumbar vein
- 28. Inferior vena cava



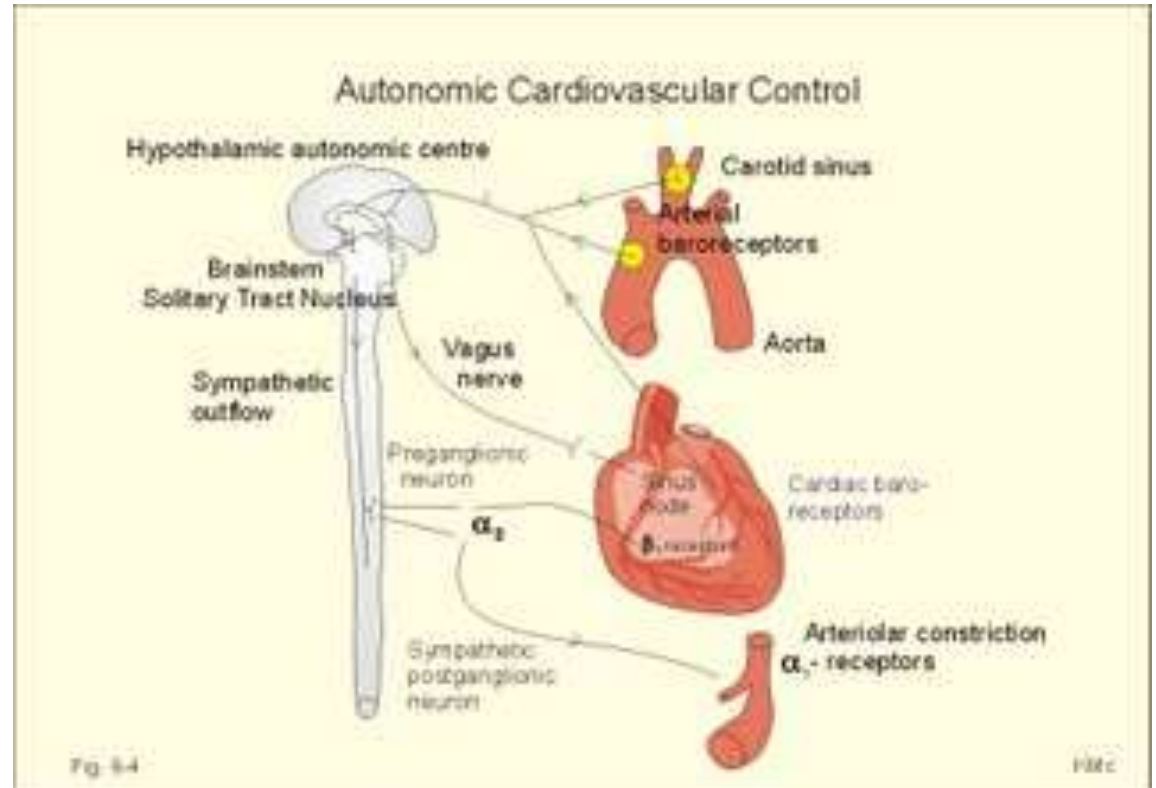
# Distribusi darah ke seluruh organ sistem



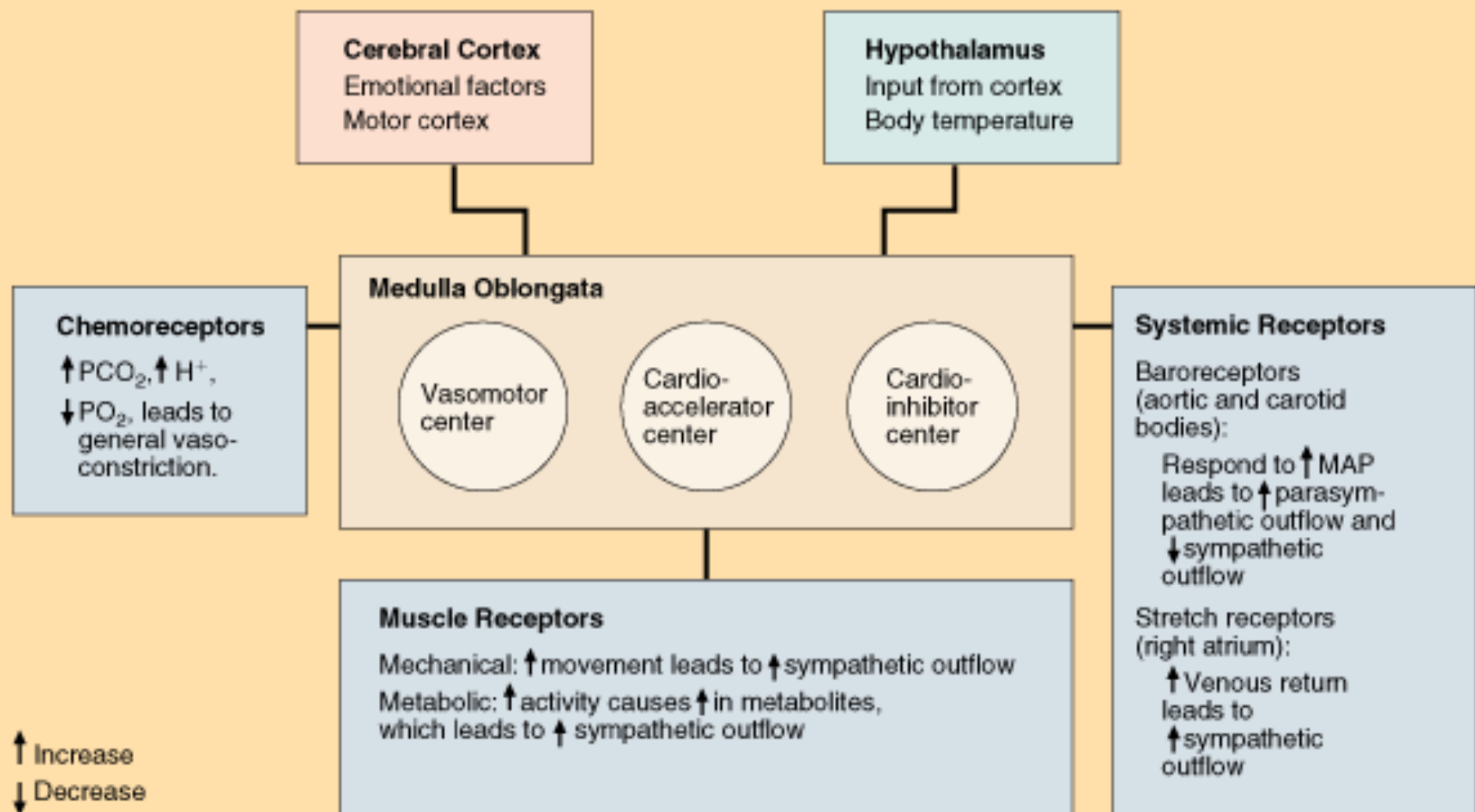


# PENGATURAN SISTEM KARDIOVASKU LAR

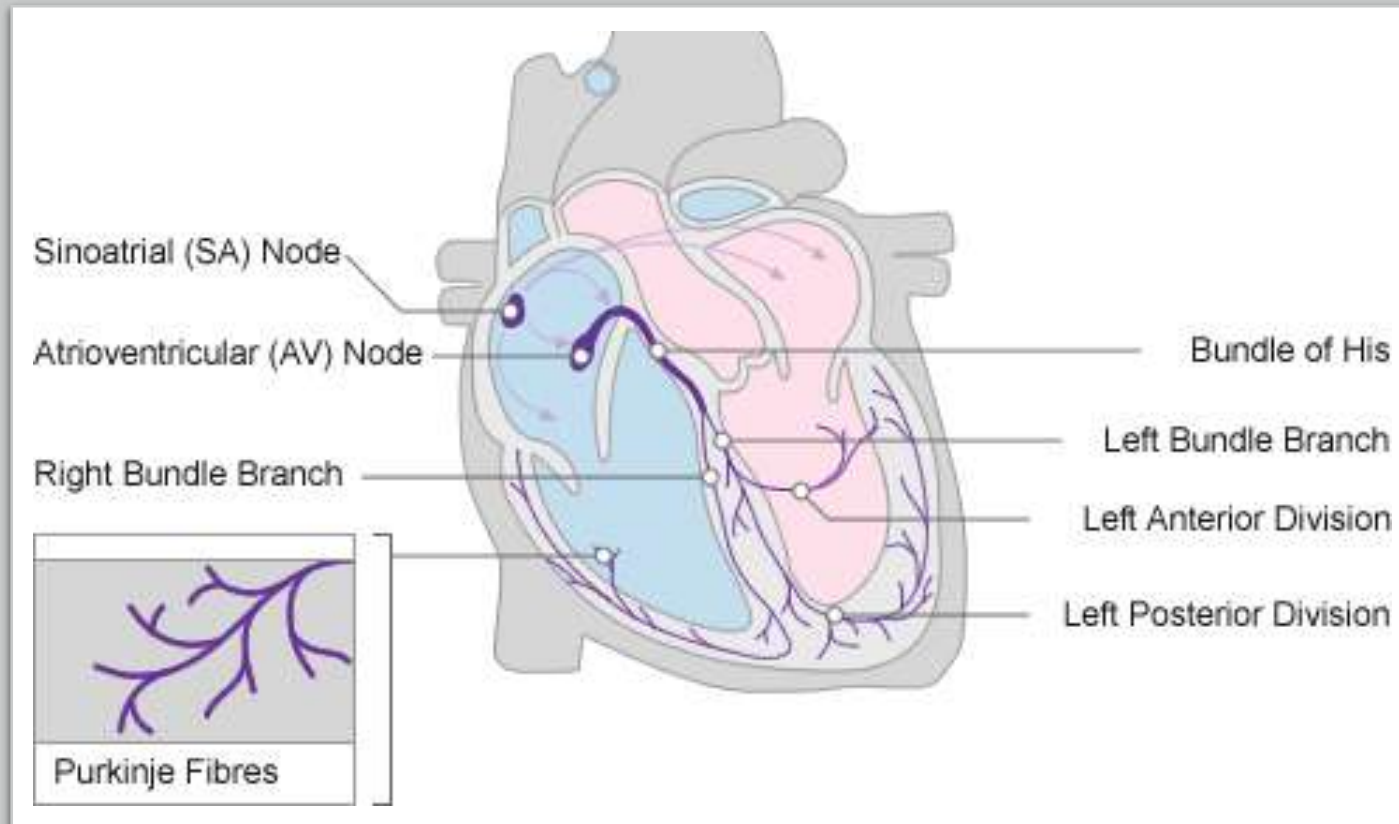
# PENGATURAN SISTEM KARDIOVASKULAR



## ► Factors Affecting Neural Control of Cardiovascular Function







# SISTEM KONDUKSI OTOT JANTUNG

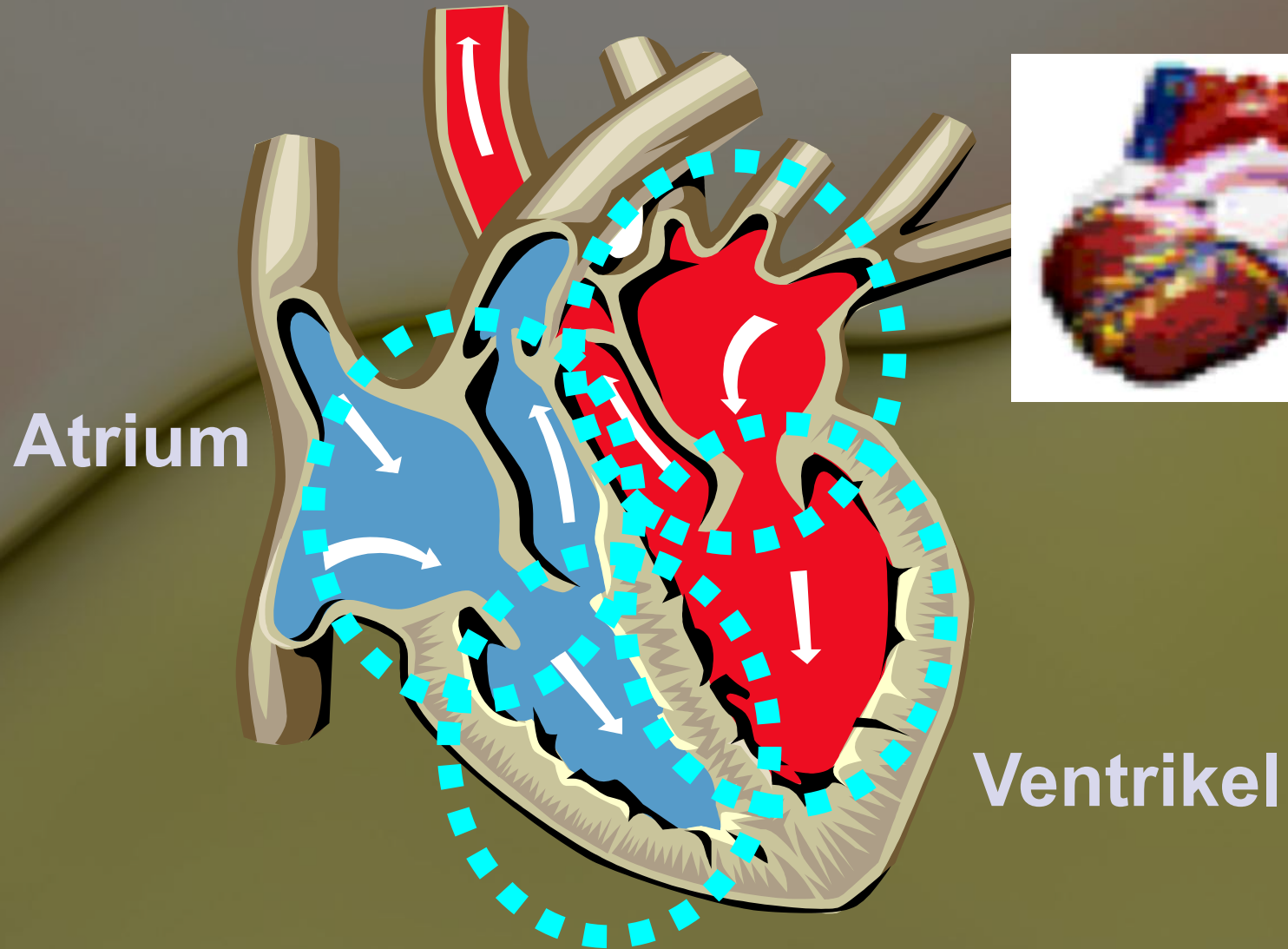
Kelistrikan jantung  
menentukan

Frekuensi  
denyut  
jantung

Irama denyut  
jantung

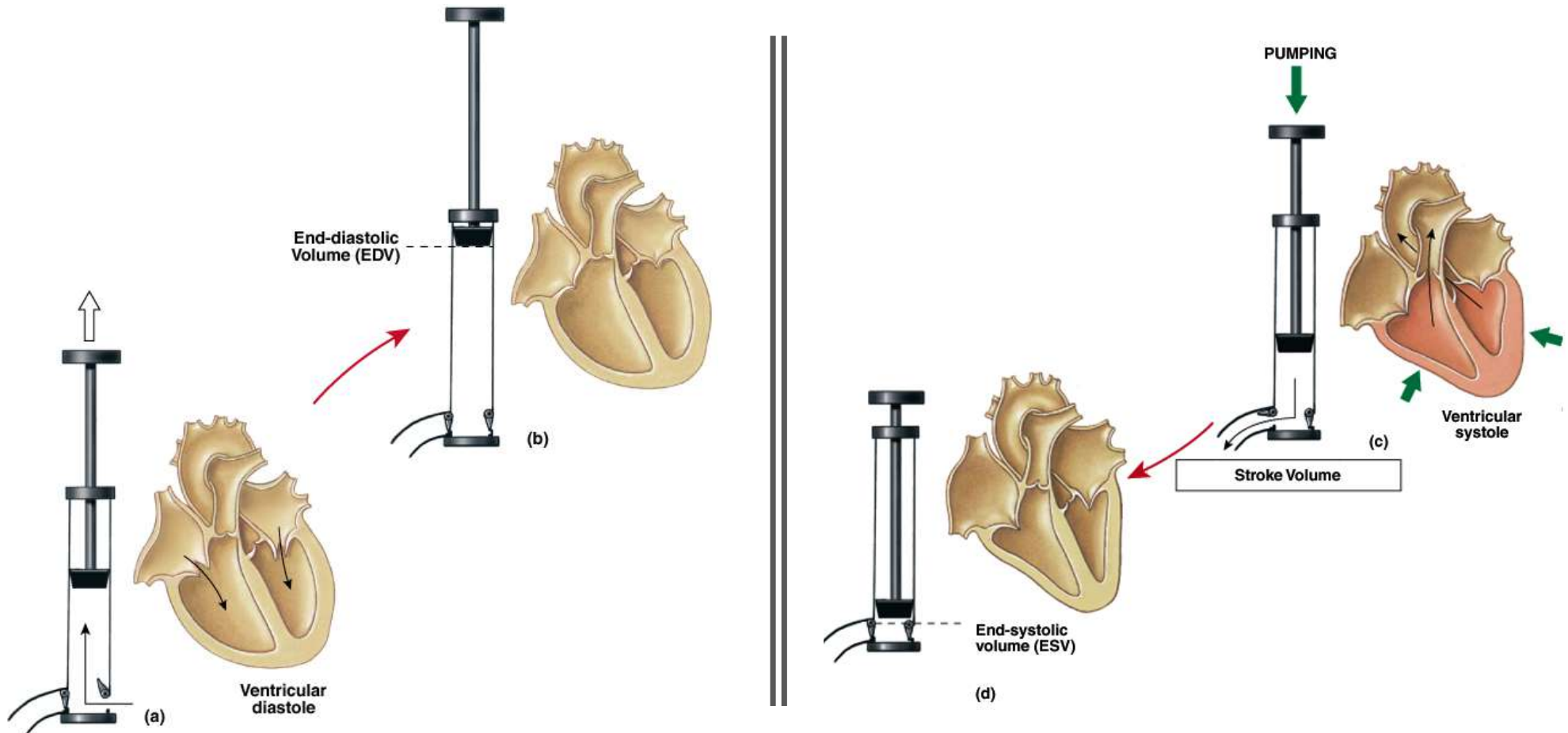
Terjadinya  
kontraksi otot  
jantung

# POMPA JANTUNG





# POMPA JANTUNG



Dua kondisi yang penting untuk mengendalikan komposisi cairan interstitial oleh sirkulasi:

- Aliran darah yang adekuat dalam kapiler jaringan
- Komposisi kimia darah yang datang sesuai untuk kebutuhan interstitial

# Internal components of homeostasis

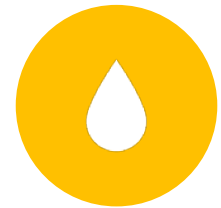
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CONCENTRATION OF  
OXYGEN AND CARBON  
DIOXIDE



PH OF THE INTERNAL  
ENVIRONMENT



CONCENTRATION OF  
NUTRIENTS AND  
WASTE PRODUCTS

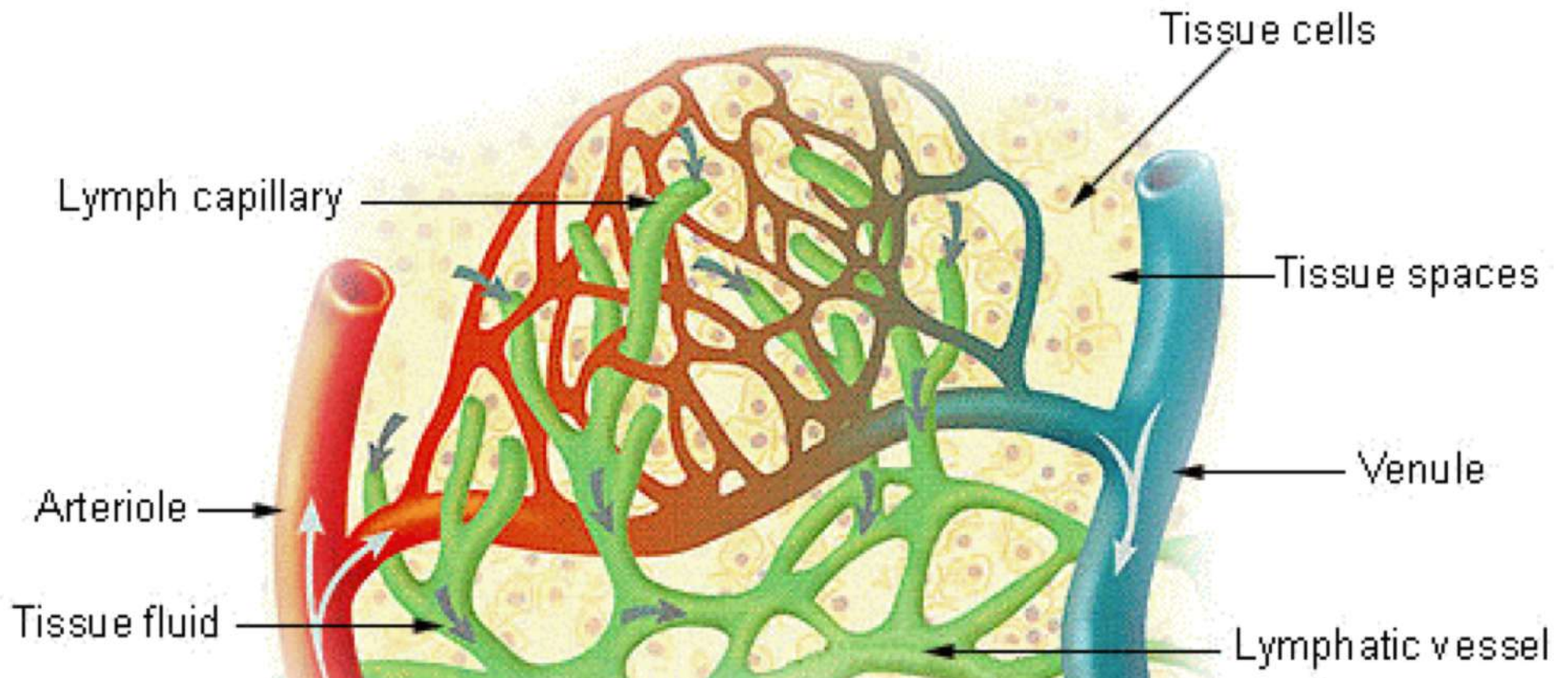


CONCENTRATION OF  
SALT AND OTHER  
ELECTROLYTES



VOLUME AND  
PRESSURE OF  
EXTRACELLULAR FLUID

## Lymph capillaries in the tissue spaces



# Capillary network

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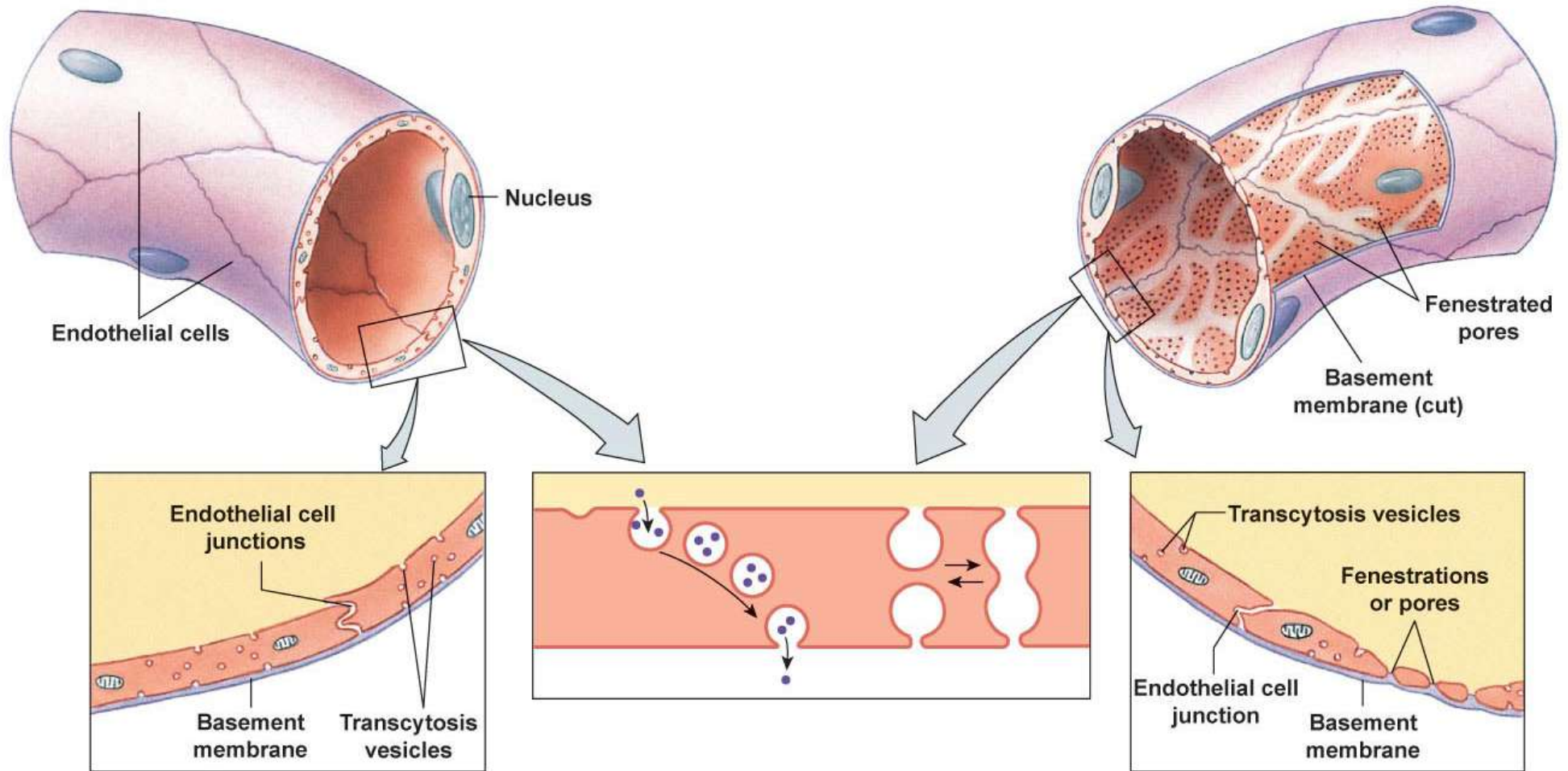
True capillaries normally branch from metarteriole and return to thoroughfare channel

**Precapillary sphincters** regulate blood flow into true capillaries

Regulated by local chemical conditions and vasomotor nerves

Blood may go into true capillaries or to shunt

# Blood Flow Through Capillary Beds



(a) Continuous capillaries have tight junctions

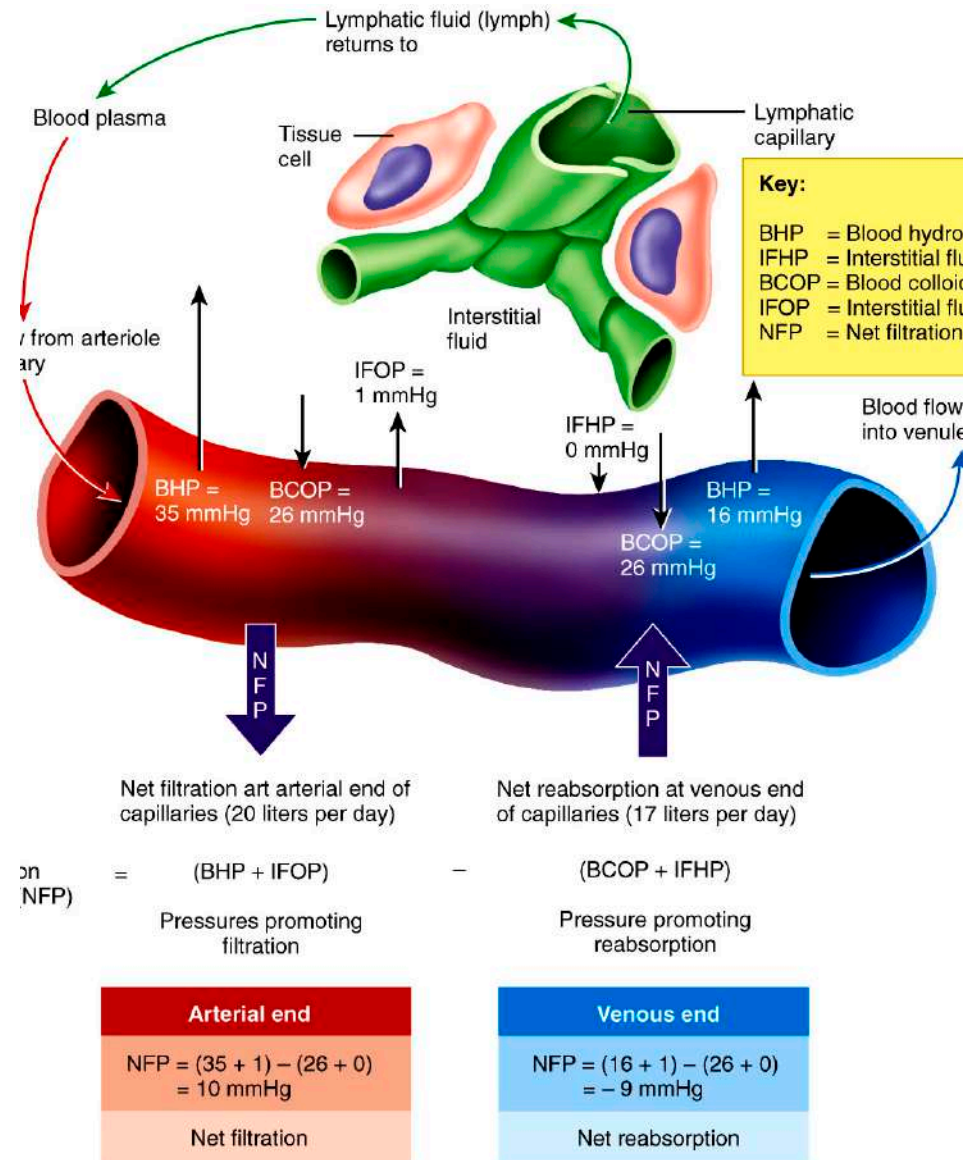
(b) Fenestrated capillaries have fenestrations

Exchange processes

- Diffusion of smaller molecules between the cells  
→ paracellular pathway
- Diffusion of larger molecules through the cells via endothelial transport (transcytosis)

# Starling's Equilibrium

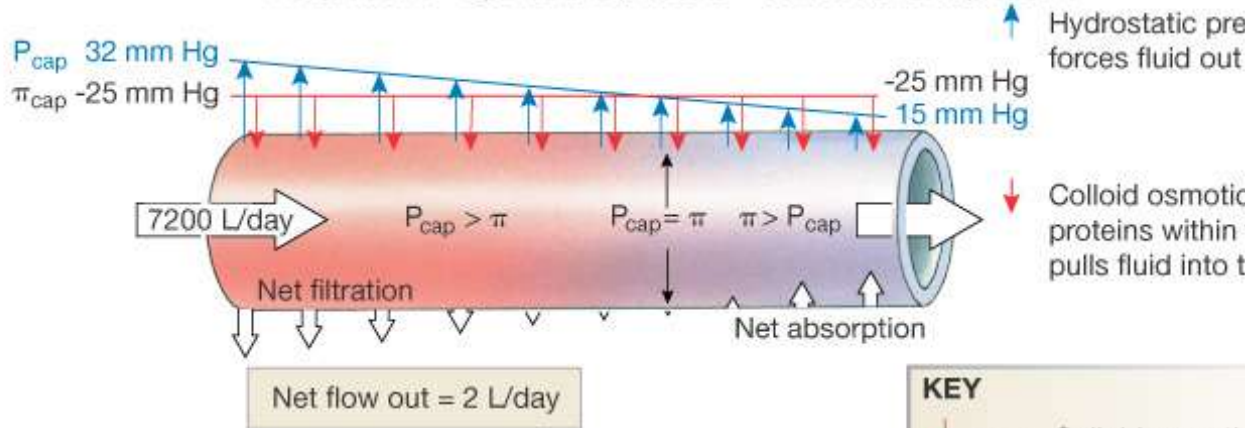
- 30 l of plasma pass out of capillaries/ day into the Interstitial Fluid.
- 27 l resorbed by capillary
- 3 l left in tissue spaces
- Where does the excess fluid of 3 L/day go?**





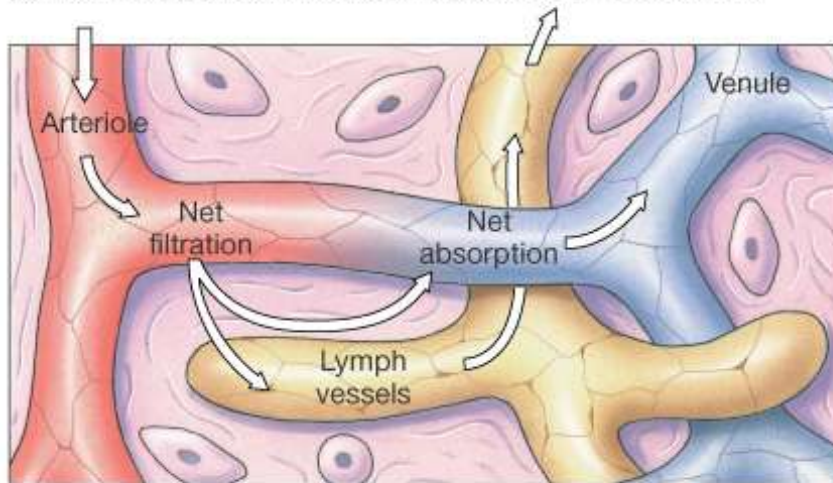
**(a) Filtration in systemic capillaries**

Net pressure = hydrostatic pressure - colloid osmotic pressure



**KEY**  
 ↓  $\pi$  = Colloid osmotic  
 ↑  $P_{cap}$  = Capillary hydrostatic

**(b) Relationship between capillaries and lymph vessels**



The excess water and so filter out of the capillary & up by the lymph vessels to the circulation.

# PERAN PEMBULUH LIMFE



thank you!