

The function of the circulatory system appears to create a dichotomy...

On one hand it has to contain blood within vessels

But...it also has to allow for exchange of substances between blood and body tissues

HOW??

Structural differences at various points within the system allow for "containment" or "exchange" functions to occur

1. **On your own...**Read Sections 23.7-23.11

2. What functions must blood vessels perform?

Are the functions a dichotomy? ...blood vessels must contain, yet allow for exchange...

3. How does the structure of blood vessels allow them to perform their required functions?

Is the structure of all vessels the same? What is the structure of vessels that must "contain" vs vessels that allow for "exchange"?

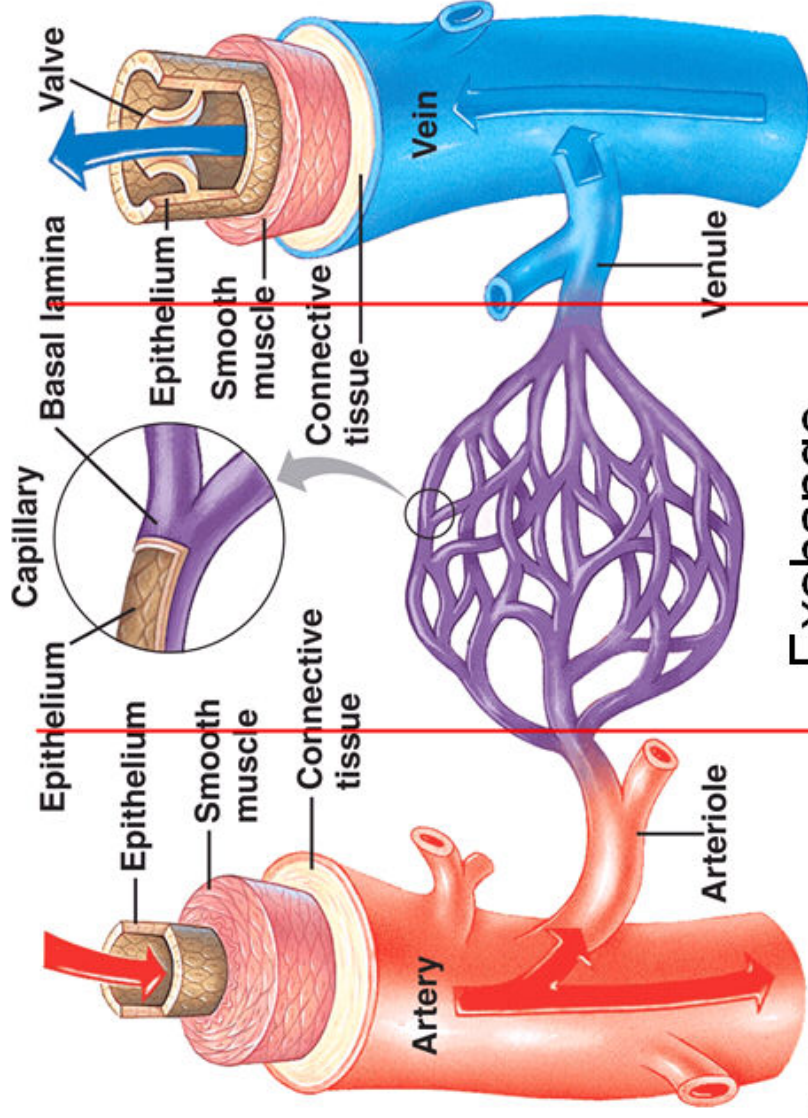
4. What causes blood pressure? What variables affect blood pressure?

...think about an analogy like water in a hose...what does the heart do...

5. Describe how smooth muscle is involved in regulating blood pressure as well as the distribution of blood...

what does smooth muscle do...

6. Describe how a capillary works...



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Containment

many layers -
no exchange
possible...
can handle high
pressures

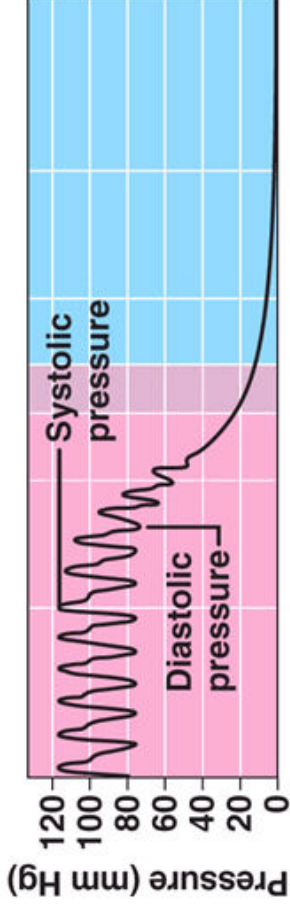
Exchange

single layer
allows for
diffusion into
interstitial fluid

Containment

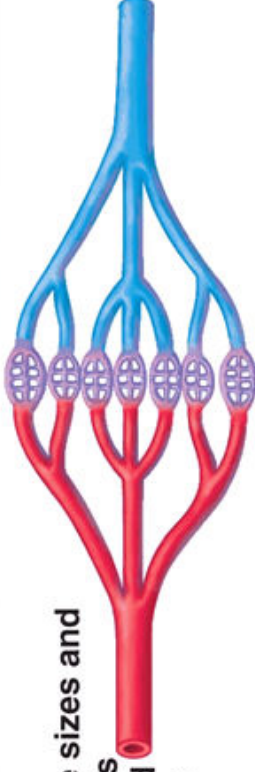
many layers -
no exchange
possible...
one-way valves
prevent backflow

Blood Pressure and Movement are also illustrative of structure vs function

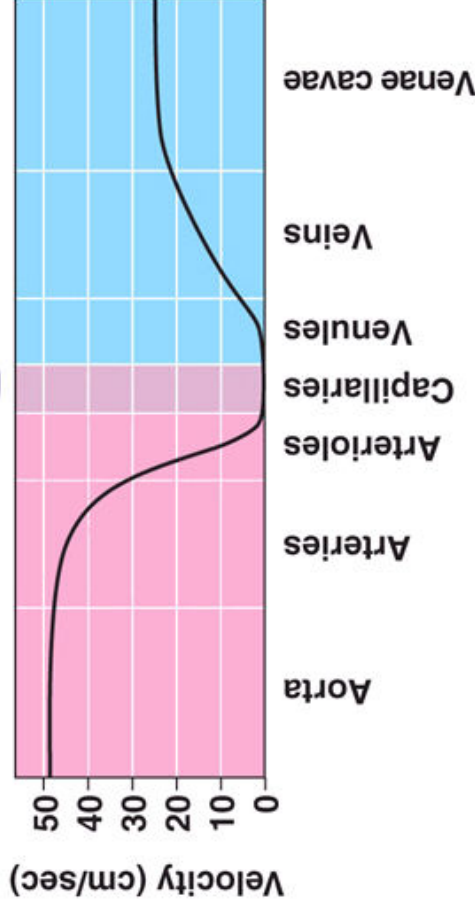


Why do we see these specific patterns??

Relative sizes and numbers of blood vessels

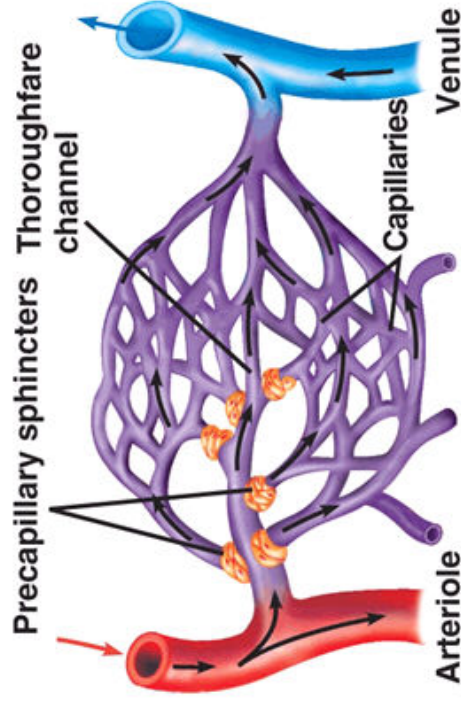


Where's the "pump"?



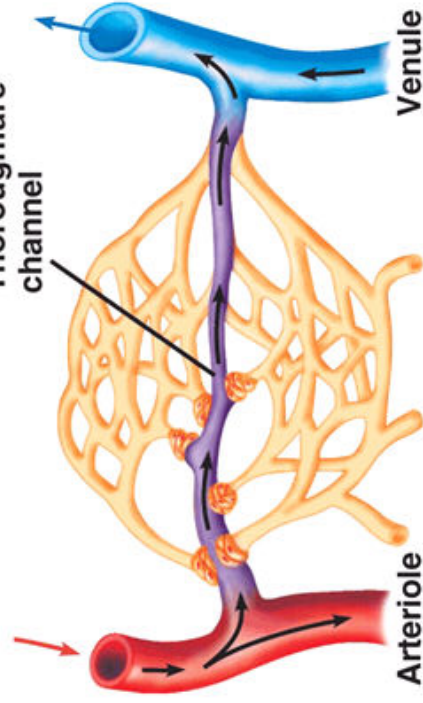
Diameter vs "collective volume"

Smooth Muscle (Involuntary) can control flow:



1 Sphincters relaxed

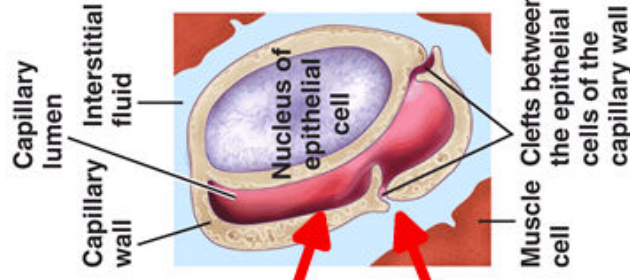
By changing diameter of vessels or opening/closing pathways



2 Sphincters contracted

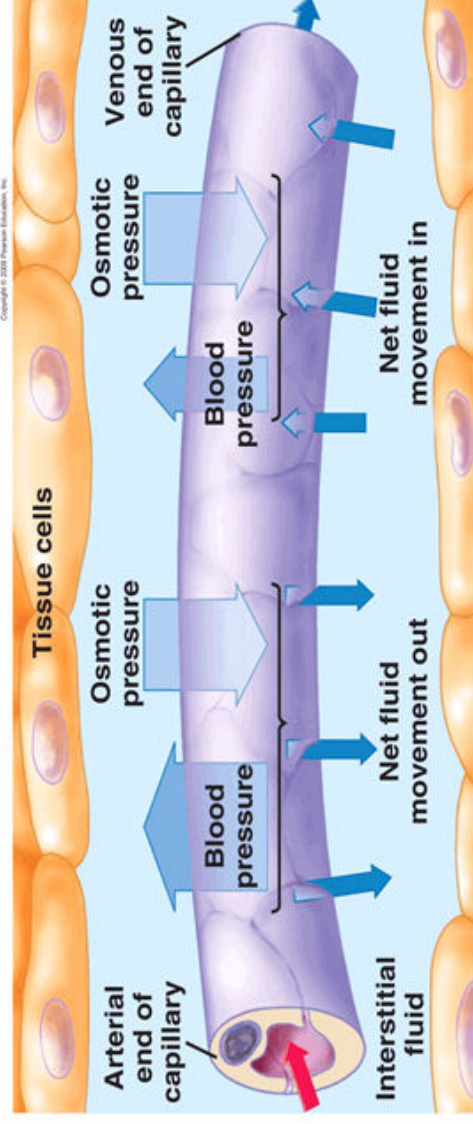
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Capillaries...another example of structure vs function



Allows for diffusion

Allows for passgae of large molecules



maintains
"volumetric"
balance