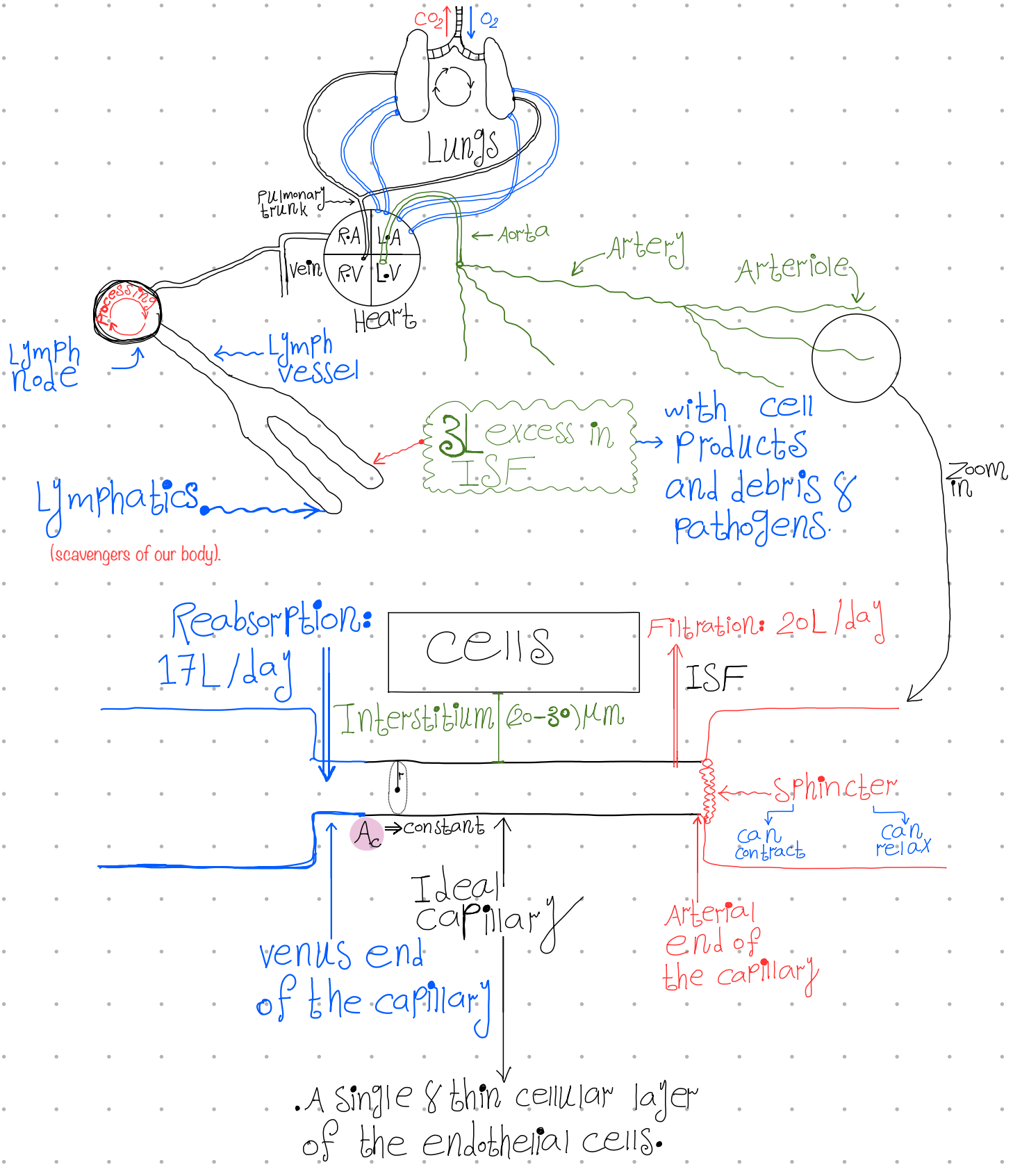


. Venule & Arteriole: . Vasoconstriction & Vasodilation

. Capillary: Neither Vasoconstriction nor Vasodilation . So: A_c ⇒ constant

In the normal circumstances the rate of filtration is preserved where this prevents happening

Edema: Over filtration

Dehydration: Low filtration

- The plasma components flow through the wall of capillary due to the blood volume presses on the capillary's wall so this leads to leakage of plasma via the capillary to

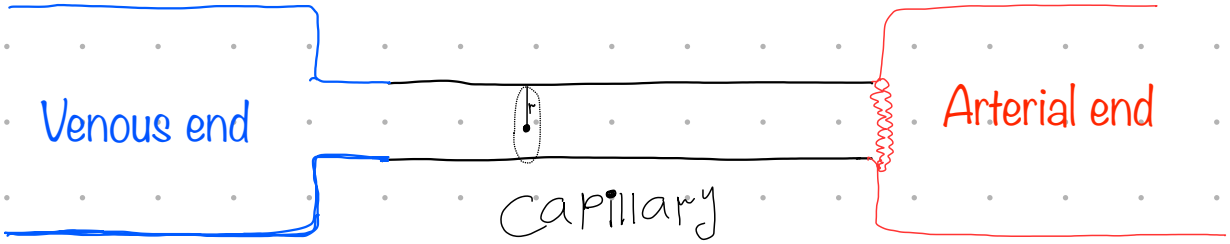
- The wall of capillary is semipermeable for the small solutes ; gases , fluids and electrolytes (they are found in

Starling forces

Two starling forces favour the **reabsorption**

Two starling forces favour the **filtration**

- What it determines if there is filtration or reabsorption via the capillary is : **The summation of all four starling forces (Net force)**



- $A_C \Rightarrow$ Constant

- $P_c = \frac{F}{A_c}$ (Constant)

The first starling force is : **Hydrostatic pressure of the capillary(Pc)**

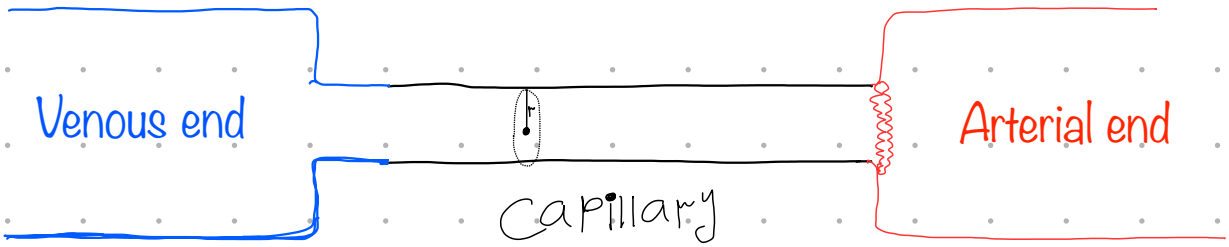
- This means that the capillary hydrostatic pressure depends on the blood volume that flows through the capillary so more blood volume , more pressing on the capillary wall and more **Pc**

- You may notice that the blood volume into the capillary is variable but how is this although the capillary can't dilate or constrict ???!

Well , this depends actually not on the capillary directly but on its both ends (arterial & venous ends) where at its arterial end there is sphincter so this manages the arteriole to constrict-Less blood flow in the capillary **OR** dilate-more blood flow in the capillary and its venus end , it may constrict -trapping the blood - more blood vloume -more pressing - more Pc **OR** dilate-less blood volume-less pressing - less Pc

Note : the blood flowage in the capillary isn't **pulsatile** , this means that isn't related to the pulse ((cardiac cycle) where each 0.5 seconds there is diastole then systole follows it immediately to 0.3seconds) so this doesn't mean that the blood flows into the capillary just during the systole duration and no blood flowage during the diastole duration , and this is referred to the sphincter at the arterial end of the capillary which it makes the blood flowage intermittent

Summary : The blood flowage in the capillary isn't tied with cardiac cycle



$$Pc = \frac{1}{6} Pa + \frac{5}{6} Pv$$

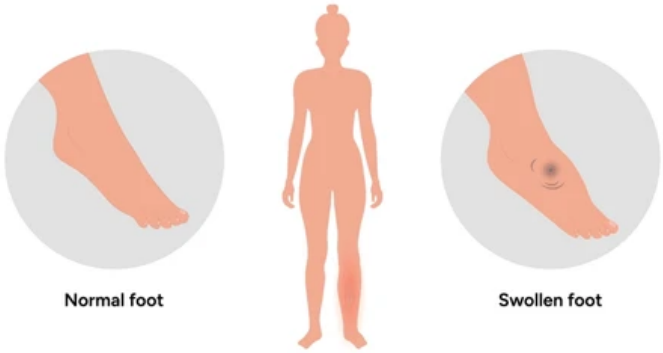
- **Pa:** pressure into the arteriole
- **Pv:** Pressure into the venule

This correlation shows that the effect of vasoconstriction on the Pc is larger than the effect of arteriodilation on the Pc at a specific level for both

Over Pc may cause :

Localized edema

This type of edema is found in specific locations within patient's body as a response to many stimuli whether they are from the exterior or interior like in the pregnant mater where the child into her uterus presses on the large vein which brings the blood from the lower limbs to the heart (Inferior vena cava) so this leads to make this vein partialis constricted so this leads to increase the blood volume in the capillaries of the lower limbs so this causes edema for the mater in her lower limbs due to over Pc



Generalized edema

In the case of the right atrium failure the venous blood stagnate in the venous circulation of the blood (Actually just the blood reaches at the (**R.A**)) so this makes the venous blood to press on the blood into the capillaries so this leads to increase the blood vloume into the capillaries and the blood will press more and more on the capillaries walls so more filtration will occur and the edema will happen in everywhere within the patient's body **Why?** All capillaries will affect from that **R.A failure**