

REFRAMING SHOCK II: THREE PRESSURES APPROACH



Ms. Jones: 43F with AMS and abdominal pain

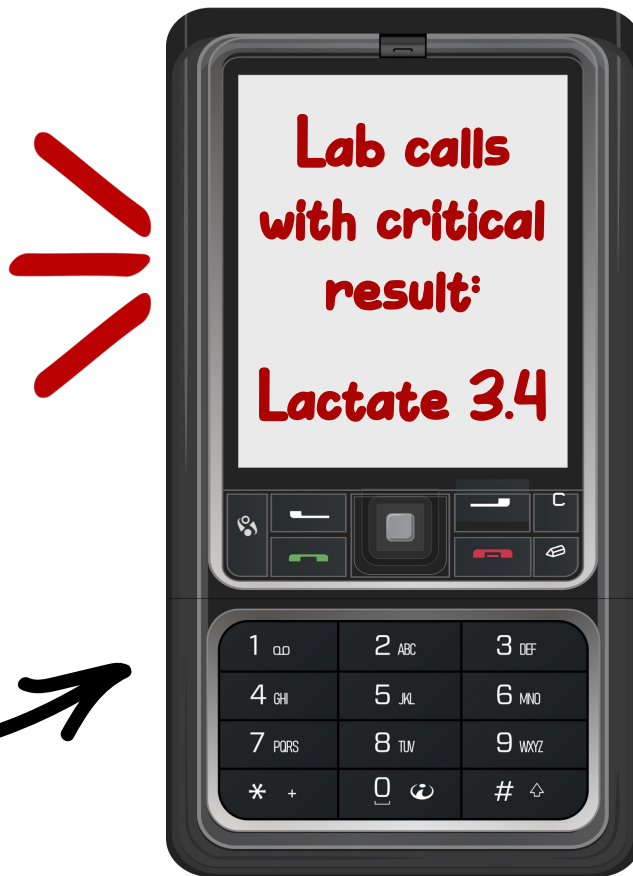
BP 112/87

HR 137

RR 34

O₂ 97%

T 37.3



Ms. Jones: 43F with AMS and abdominal pain

HPI: Per EMS found on bench in nearby park. agitated, complaining of diffuse abdominal pain. history of methamphetamine use

Physical Exam

General: Thin, diaphoretic

Abdomen: Distended, diffusely tender

Heart: Tachycardic, regular

Lungs: Clear

Extremities: Cool

Neurological: Non-focal

Na	140
K	4.2
Cl	99
HCO ₃	13
BUN	43
Cr	2.5
Glucose	101
AG	25
Mg	2.1
Lactate	3.4

WBC	13.4
Hgb	10.1
Hct	31.0
Platelet	226

AST	465
ALT	498
Bili	1.1
ALP	156
Albumin	3.1

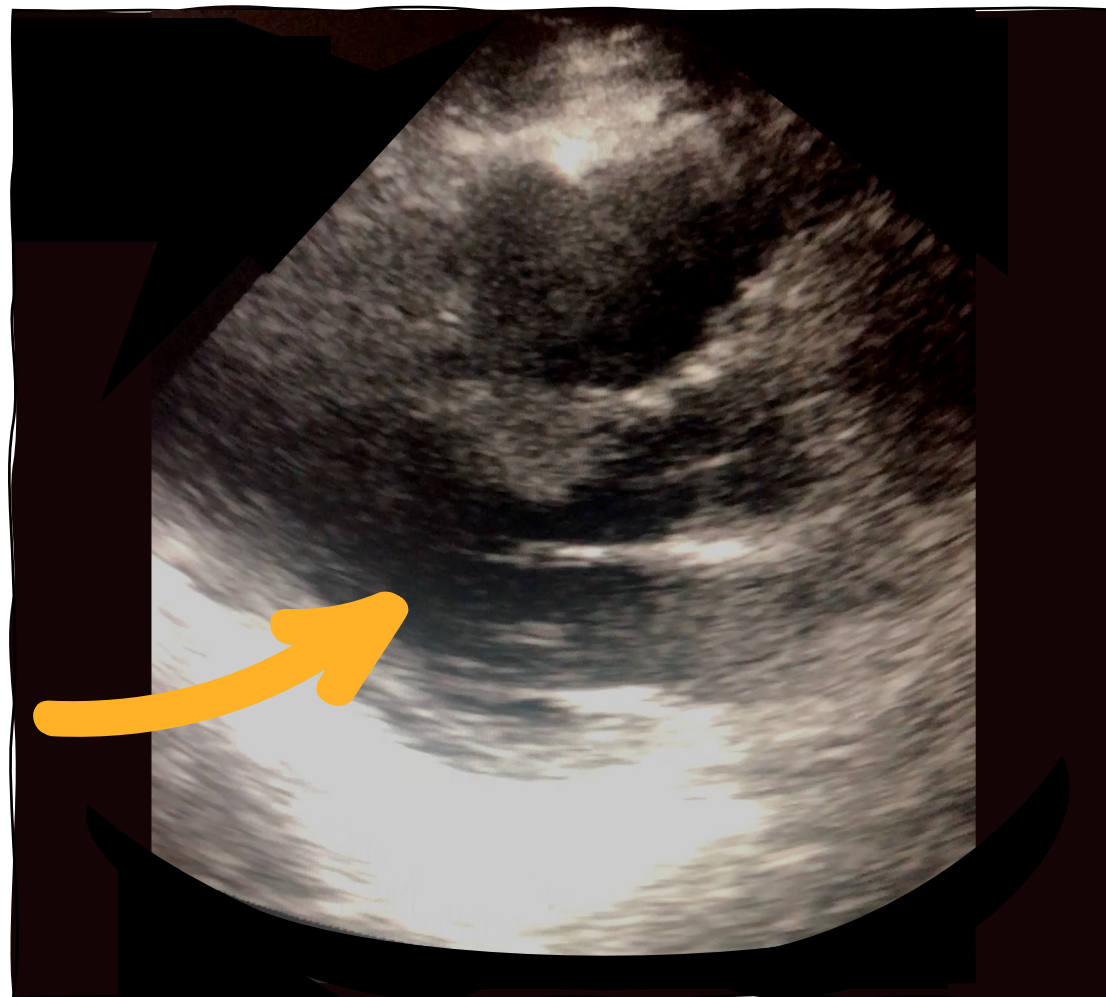
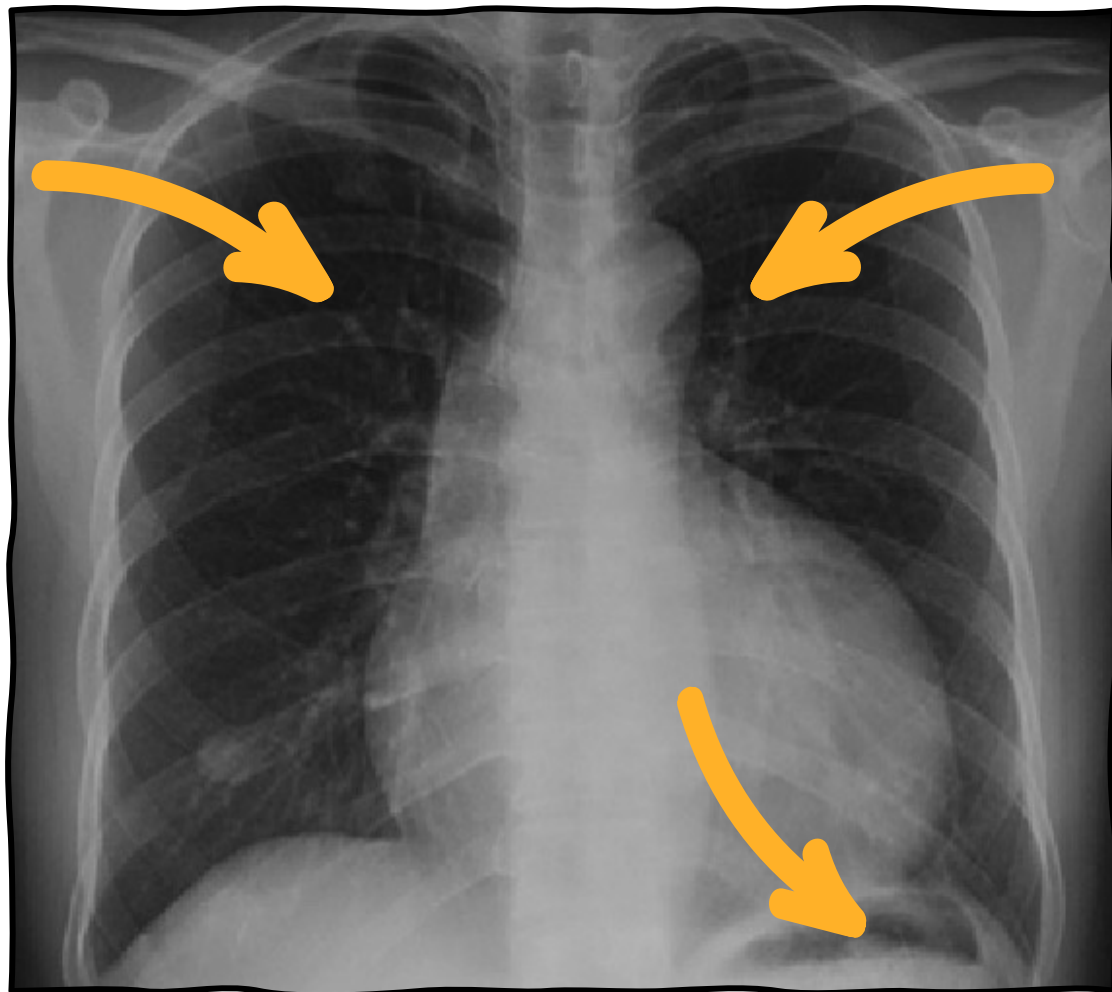
Ms. Jones: 43F with AMS and abdominal pain

- ✓ 1L IVF bolus
- ✓ Antibiotics
- ✓ CT Abdomen



The antibiotics and 1L bolus are in but the BP is now 83/46...
Do you want to start another fluid bolus?

Ms. Jones: 43F with AMS and abdominal pain

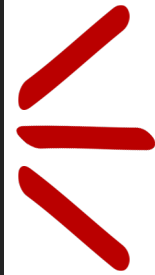


Ms. Jones: 43F with AMS and abdominal pain

✓ 2nd 1L IVF bolus

BP still 80s/40s

✓ Norepinephrine



Second fluid bolus is in.
but norepi now maxed out
BP 78/49 and repeat
lactate now 5.6...
Please advise.





PERFUSION PRESSURE FRAMEWORK

3-PRESSURES PHYSIOLOGY MAP

APPROACH TO MANAGEMENT



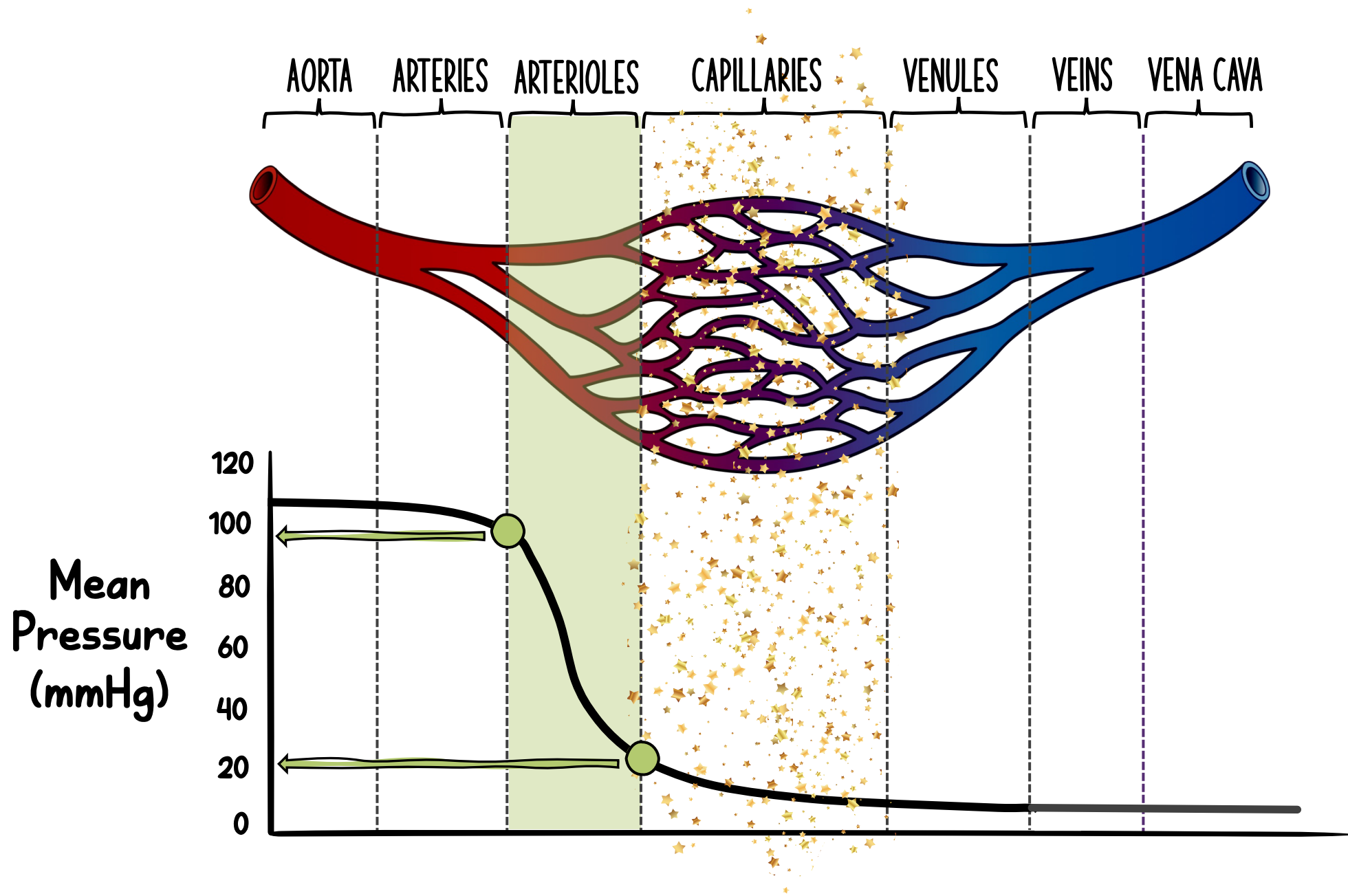
SHOCK \neq
HYPOTENSION

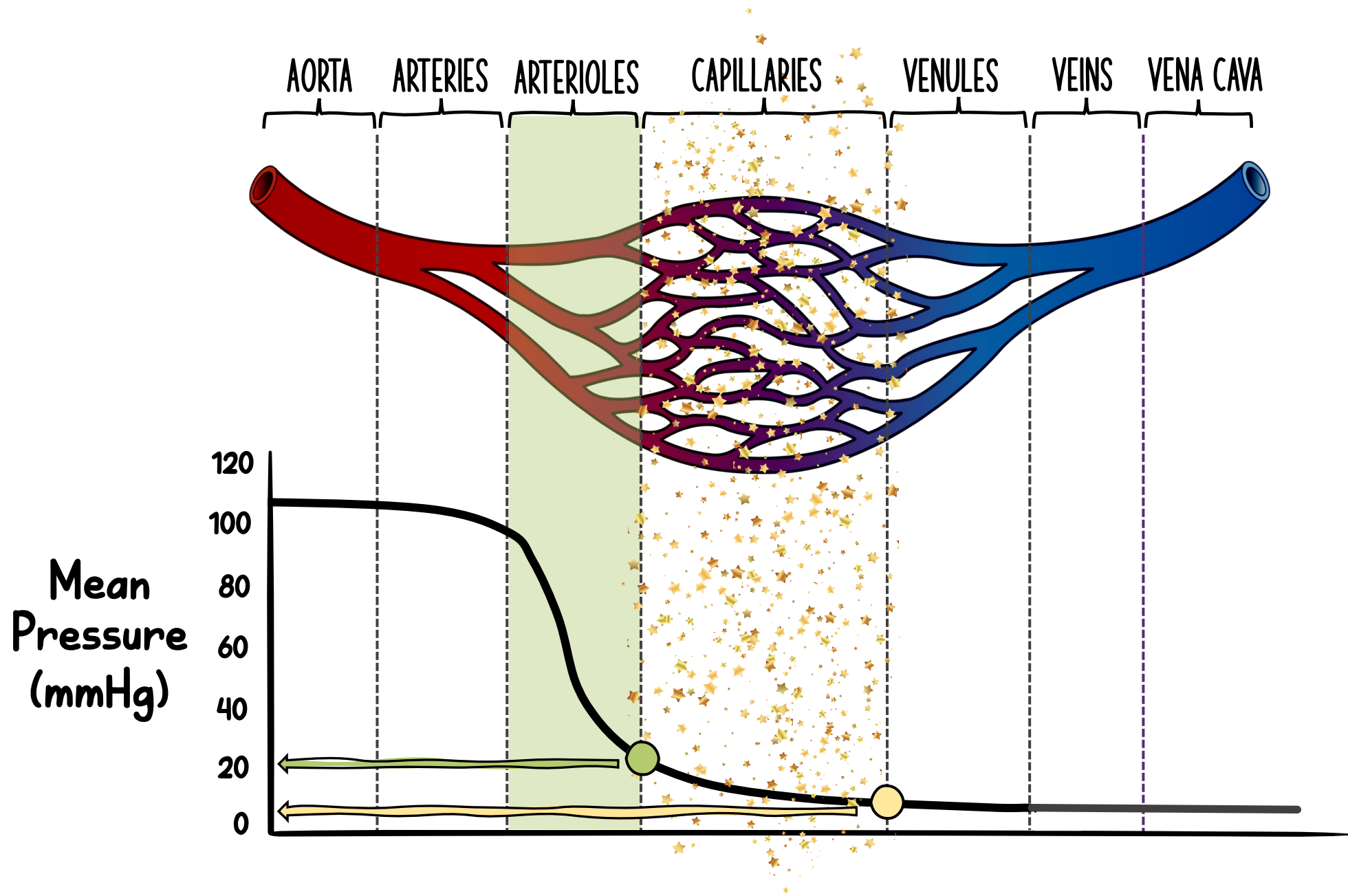
SHOCK =
HYPOPERFUSION

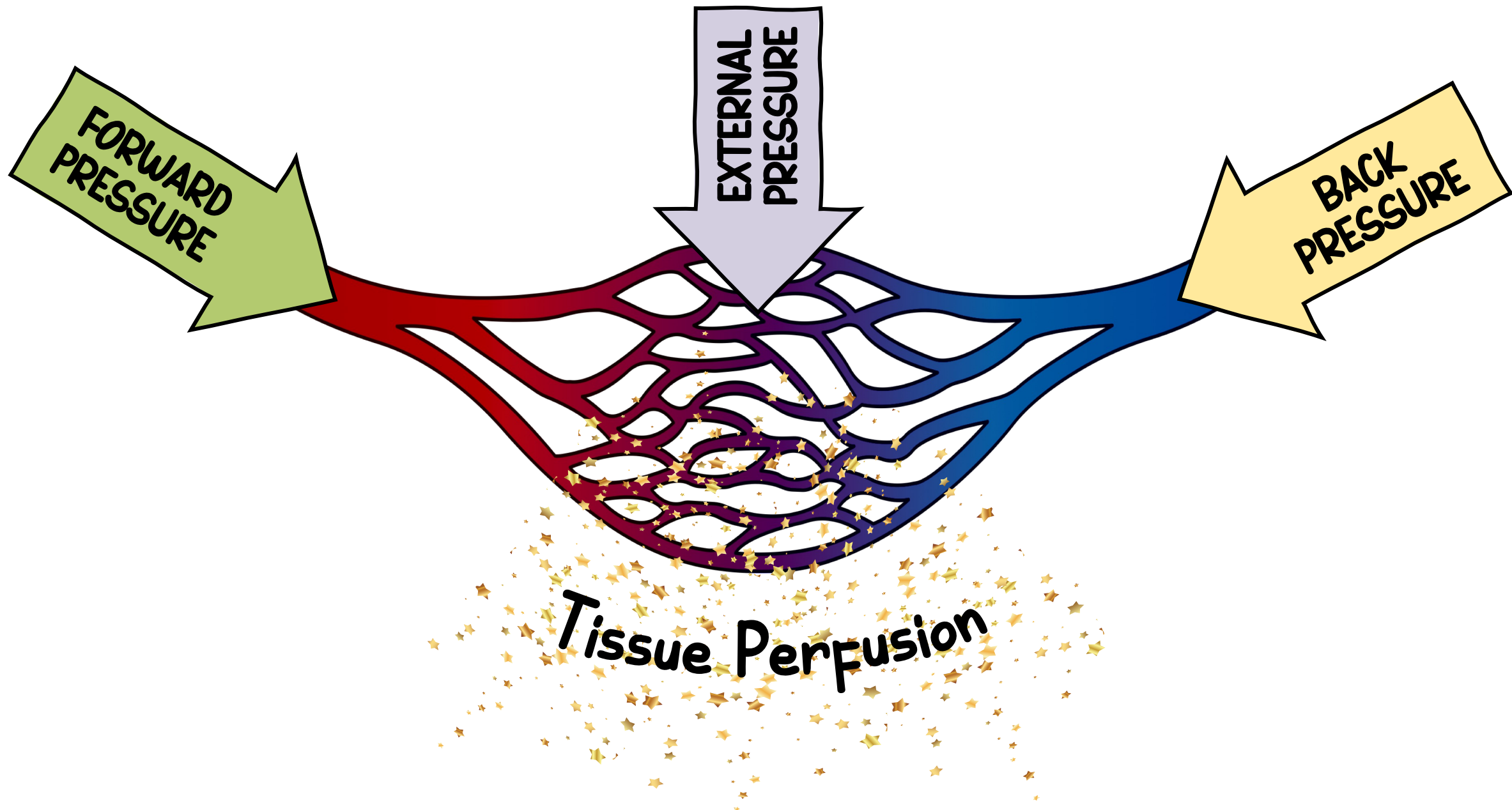
MICROCIRCULATION



Tissue Perfusion





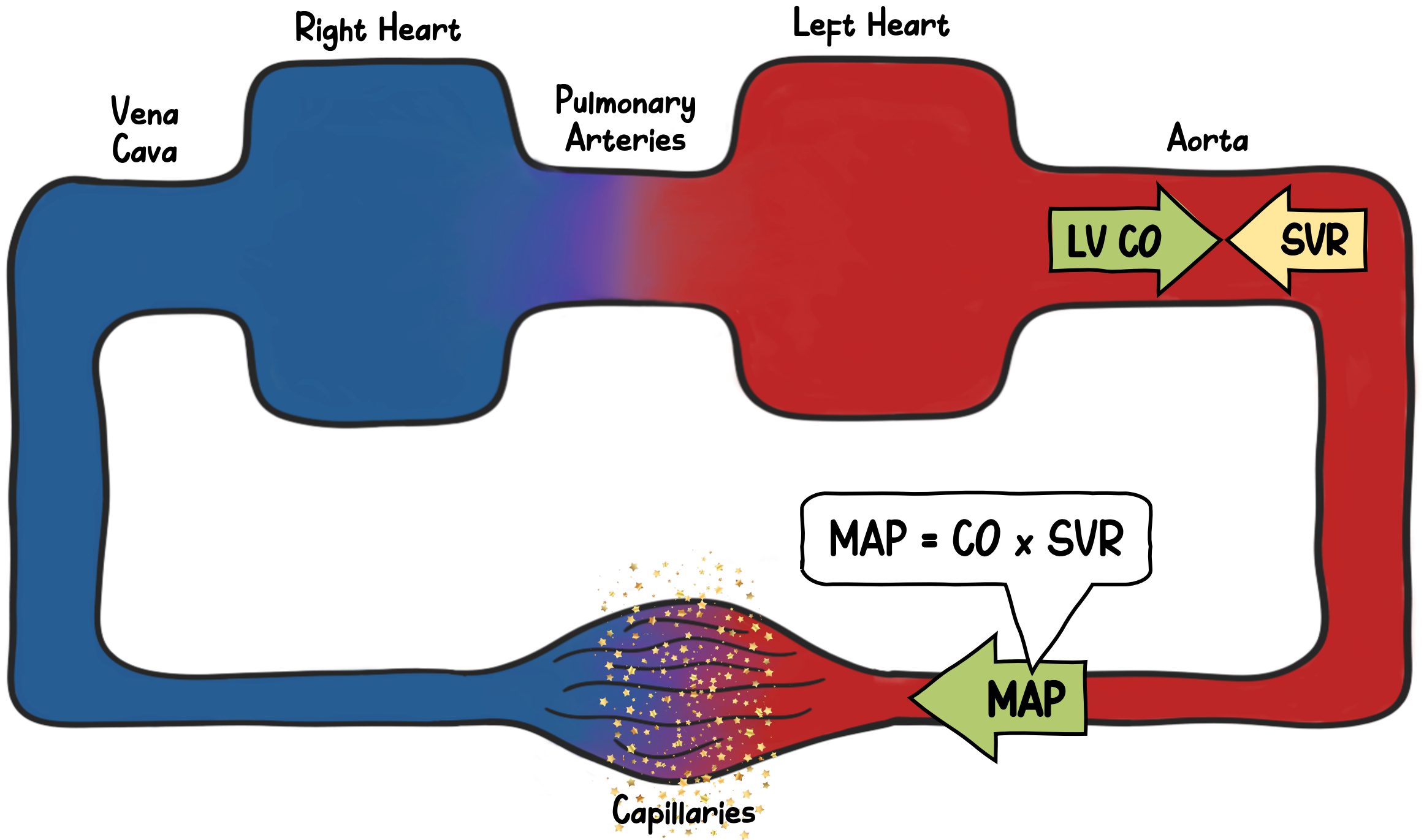


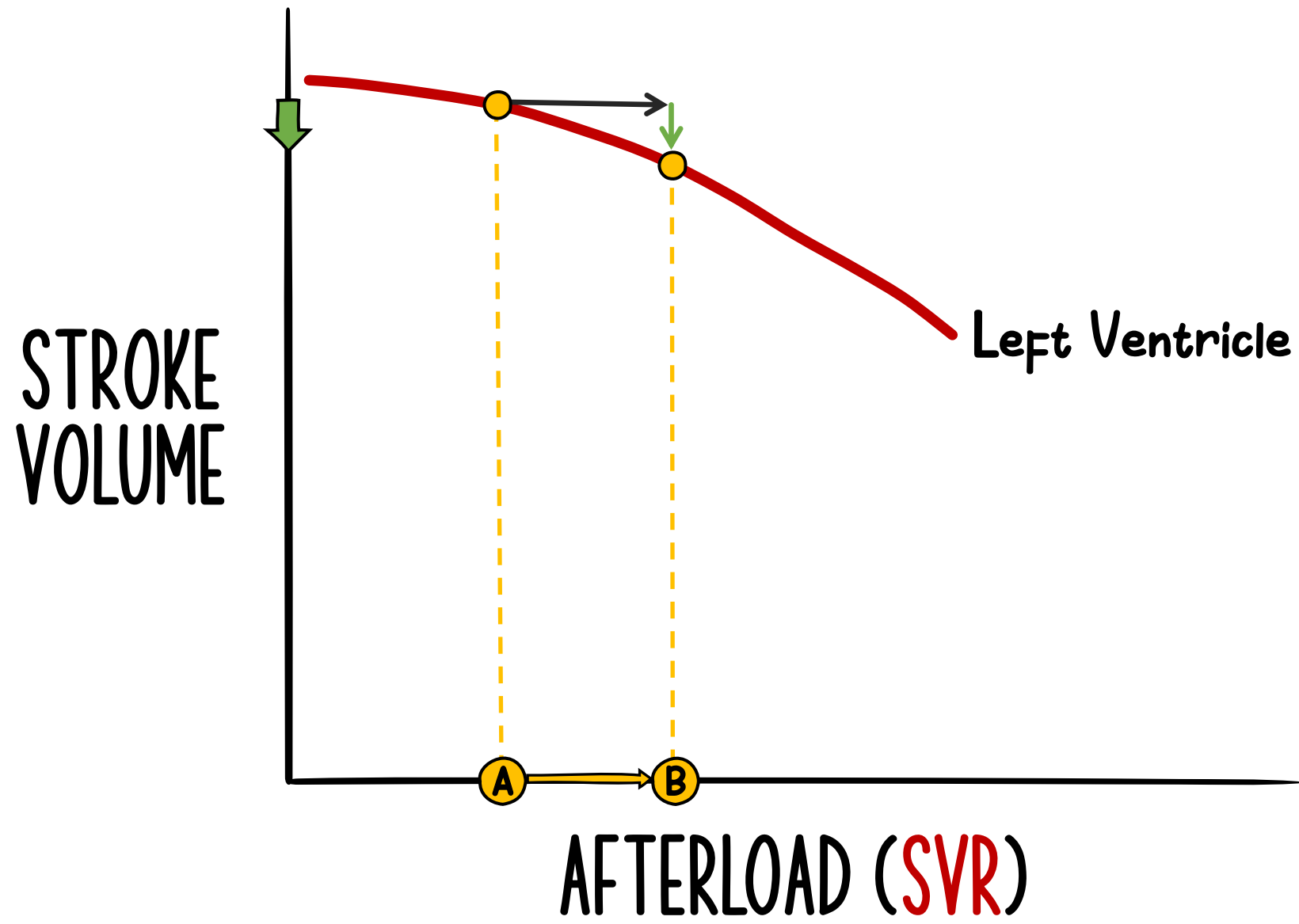


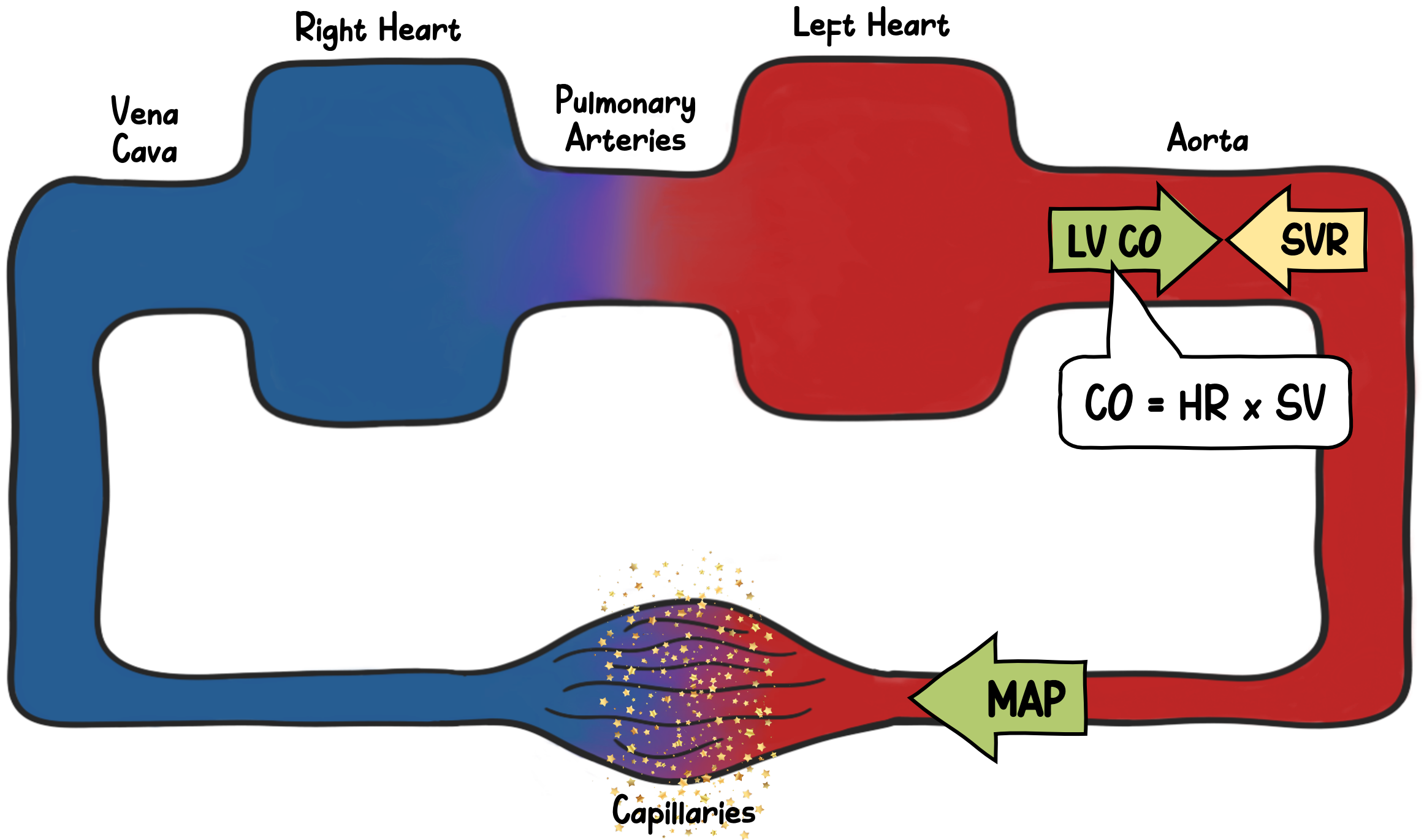
PERFUSION PRESSURE FRAMEWORK

3-PRESSURES PHYSIOLOGY MAP

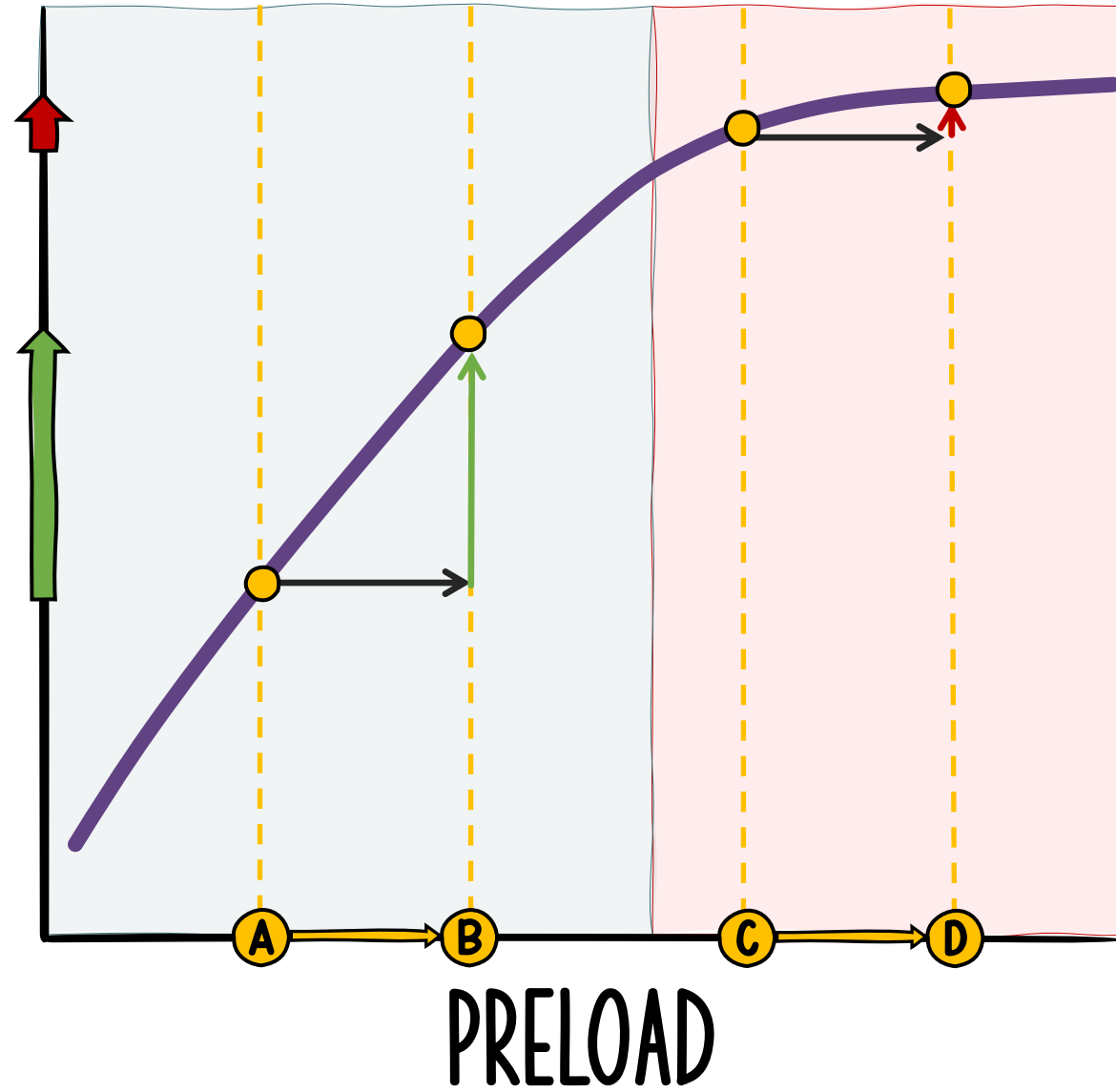
APPROACH TO MANAGEMENT

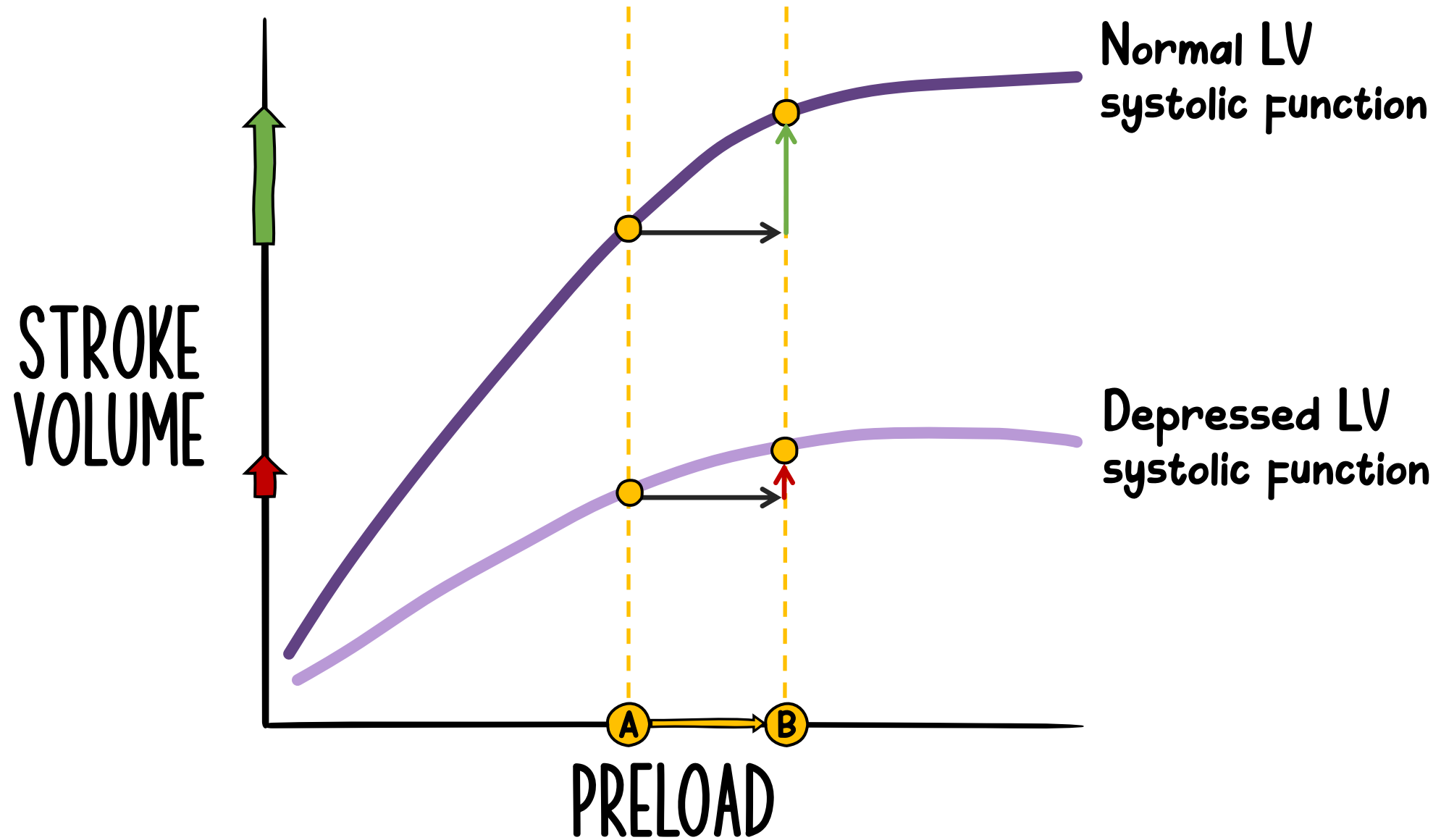


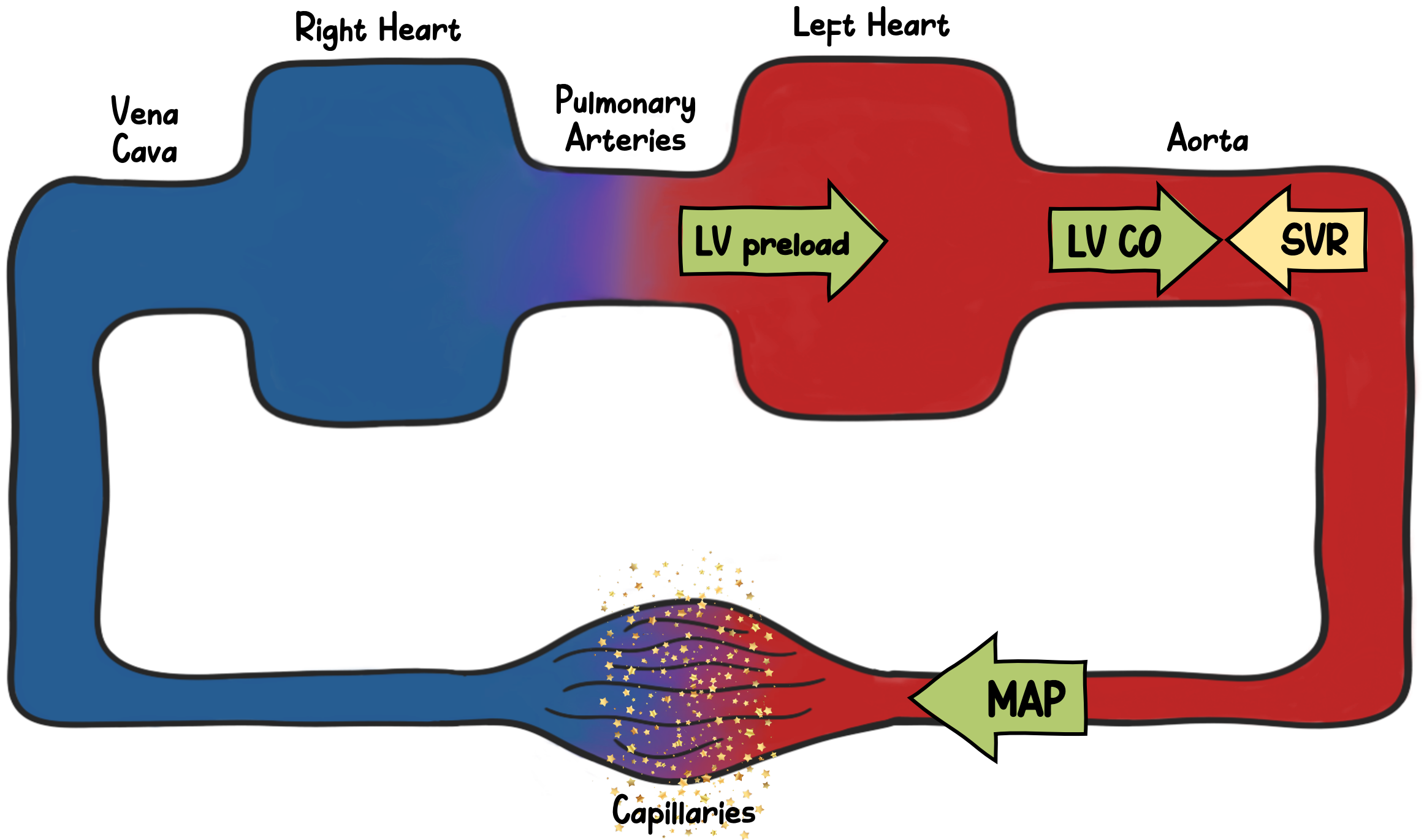


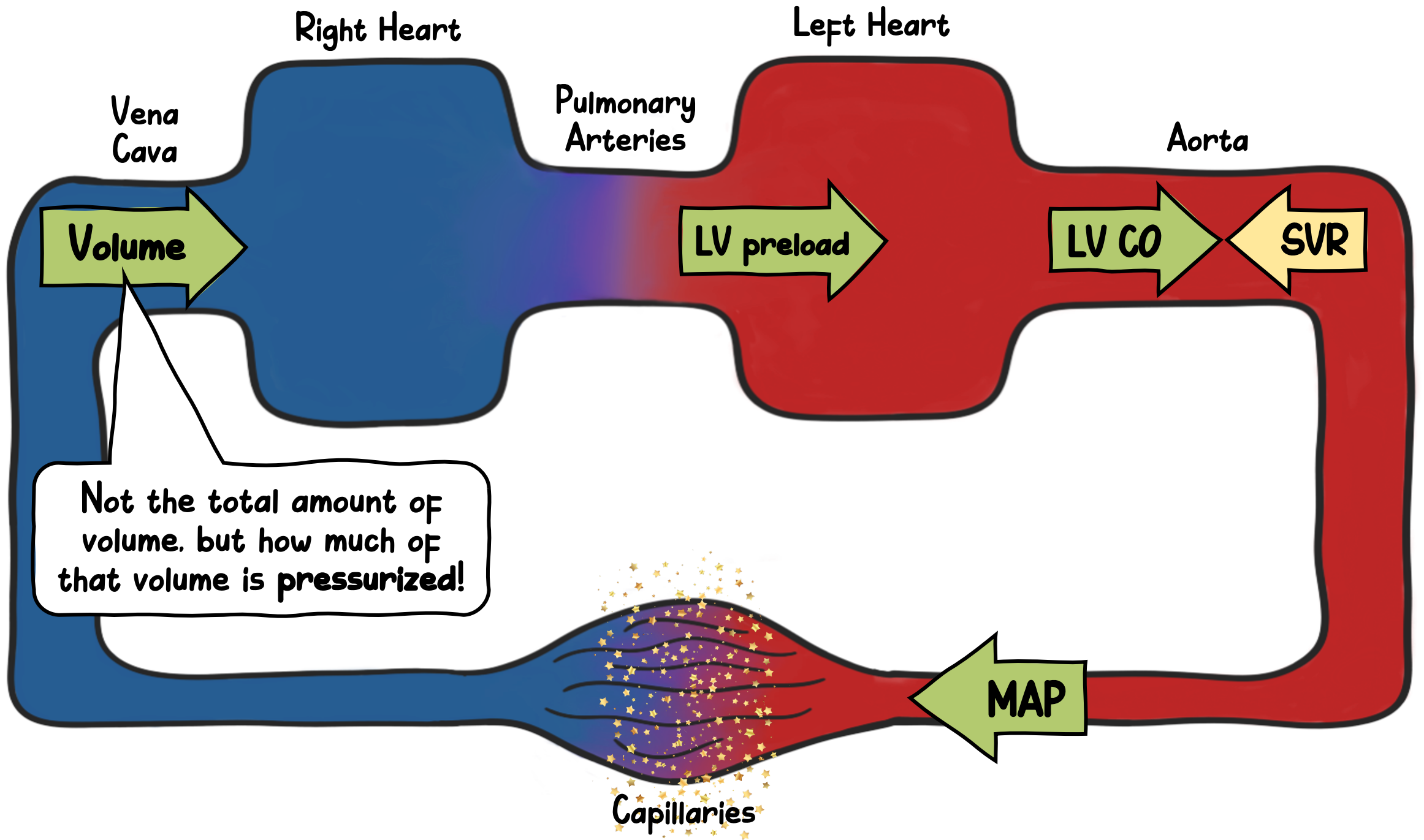


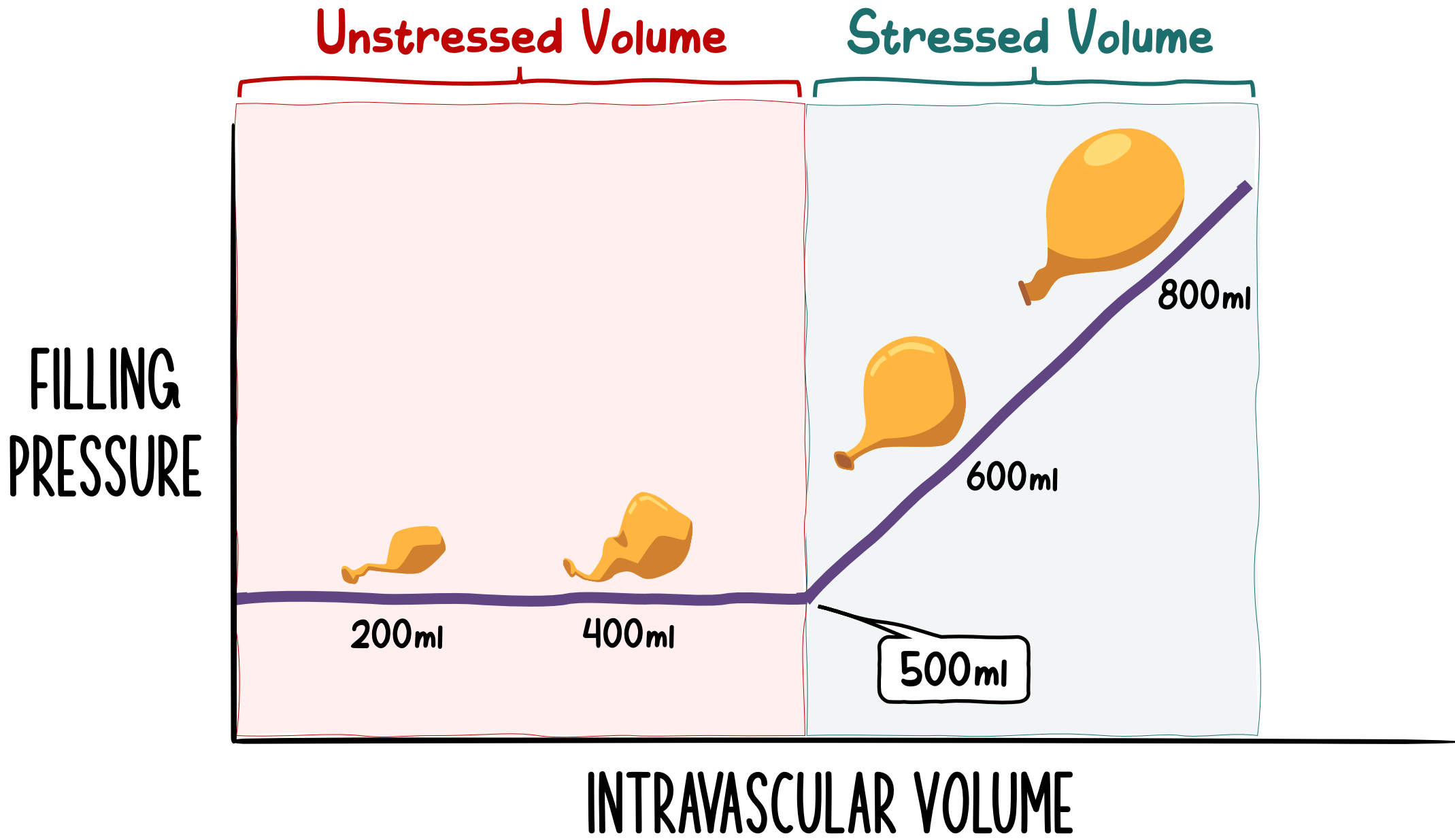
STROKE
VOLUME

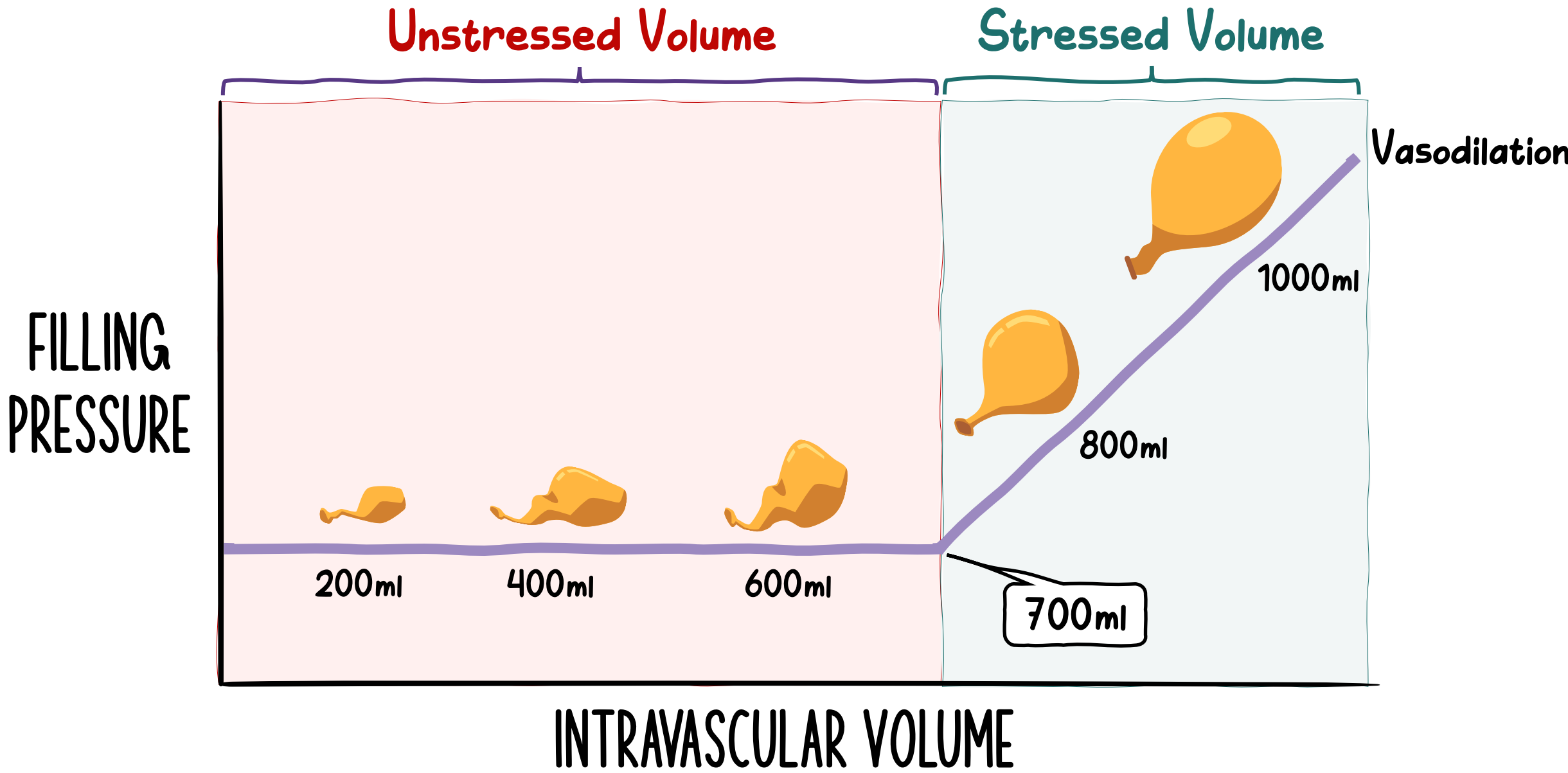












Right Heart

Left Heart

Vena Cava

Pulmonary Arteries

Aorta

Stressed volume

RV CO

PVR

LV preload

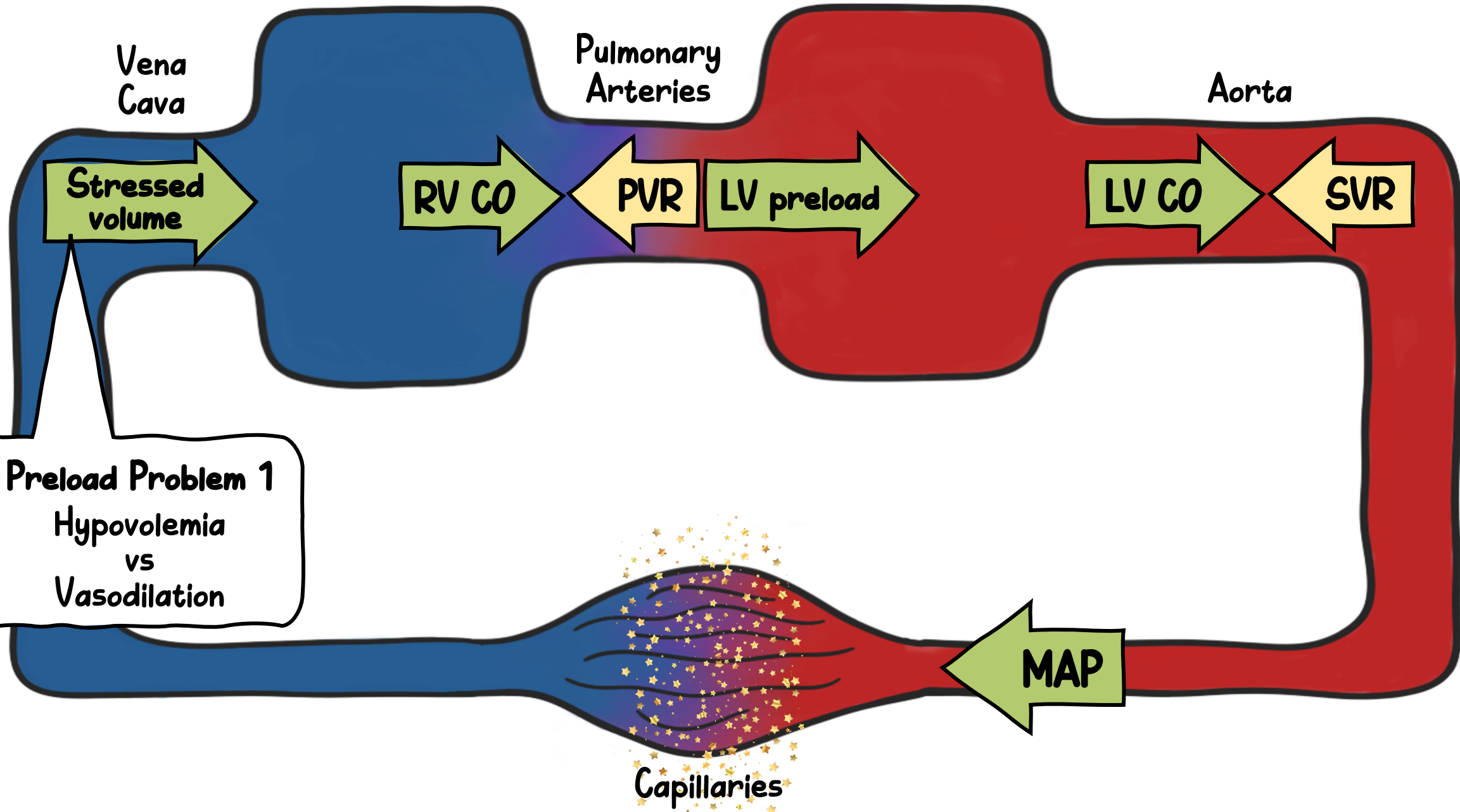
LV CO

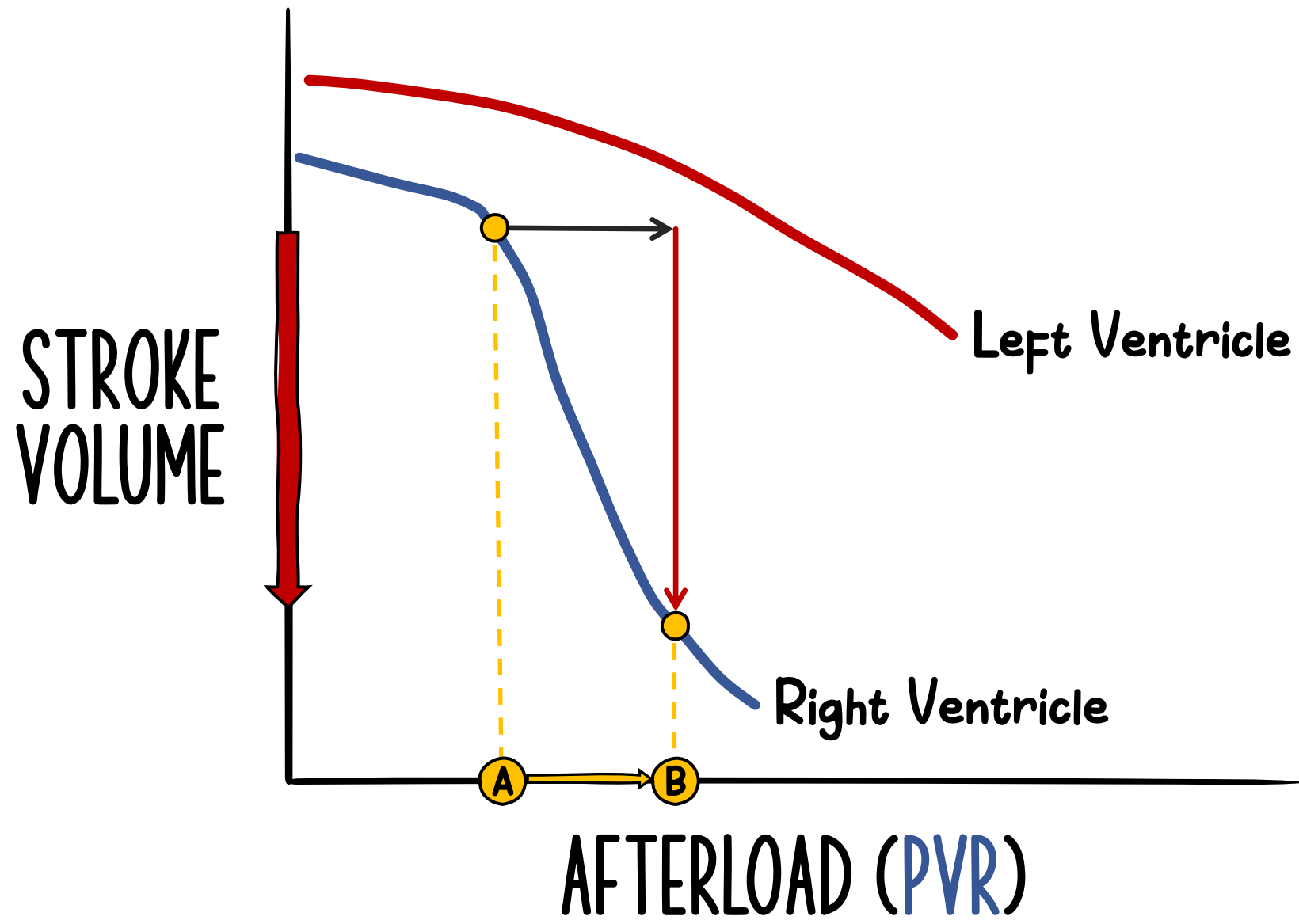
SVR

Preload Problem 1
Hypovolemia
vs
Vasodilation

MAP

Capillaries





Right Heart

Left Heart

Vena Cava

Pulmonary Arteries

Aorta

Stressed volume

RV CO

PVR

LV preload

LVEDP

LV CO

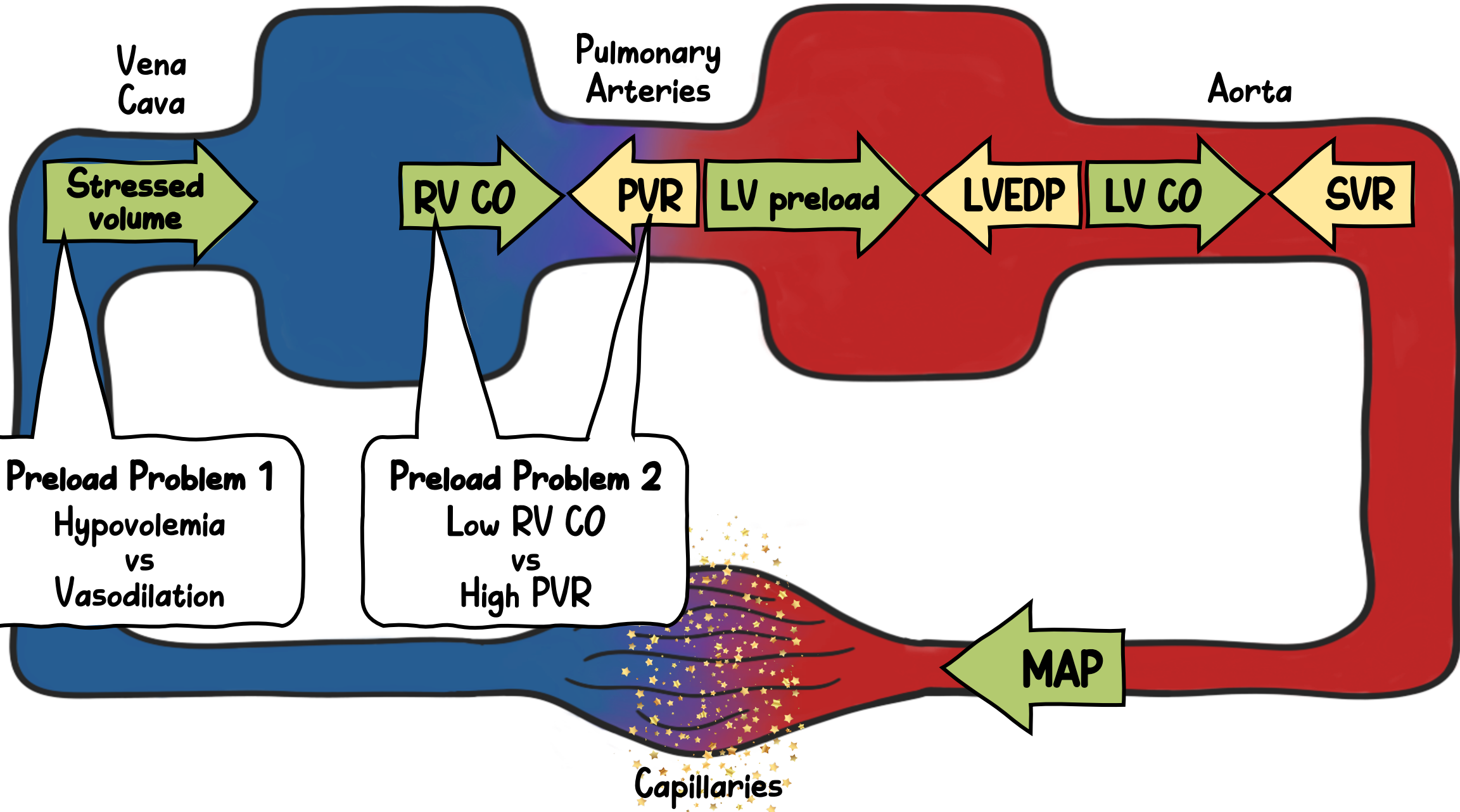
SVR

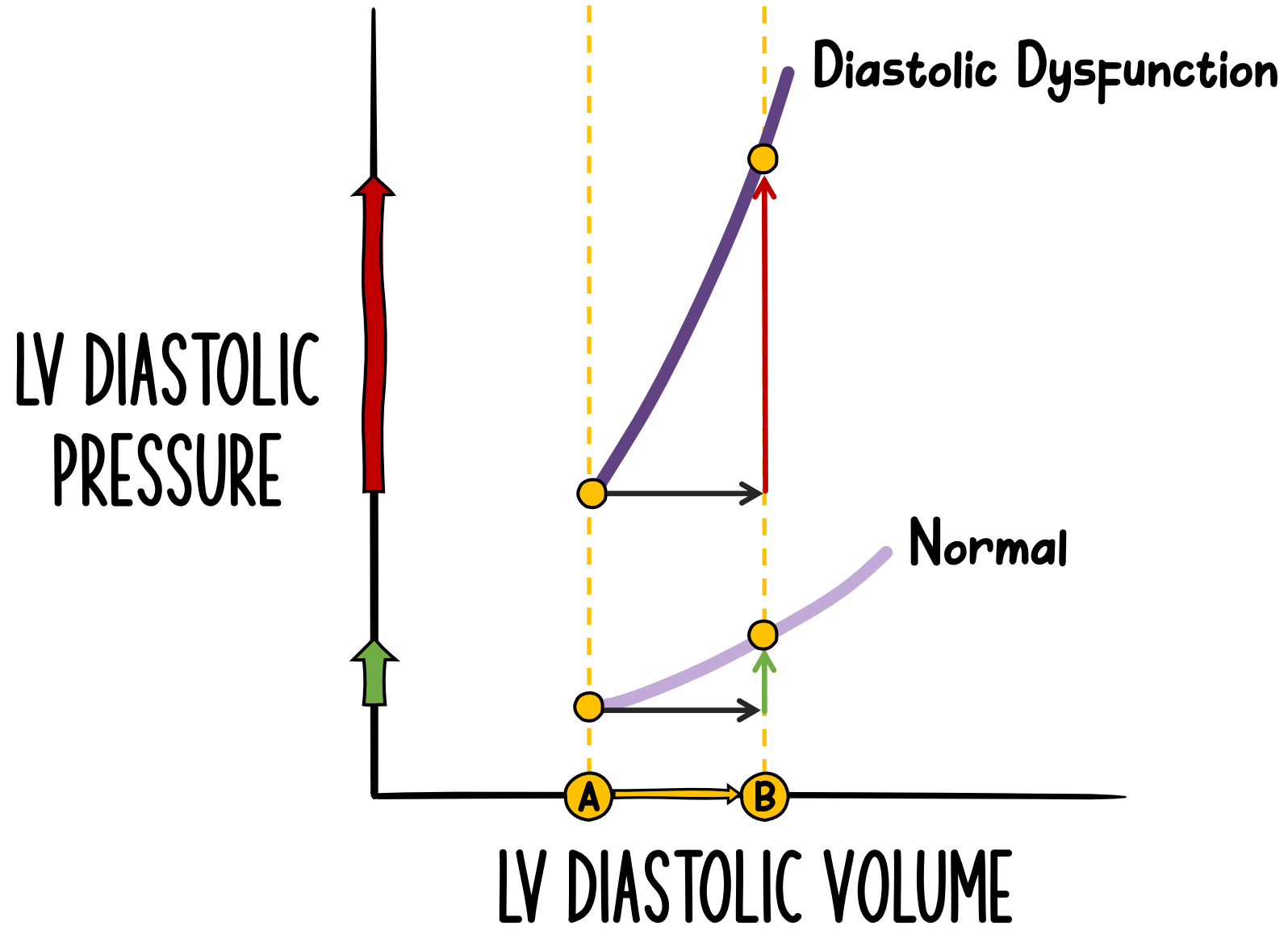
Preload Problem 1
Hypovolemia
vs
Vasodilation

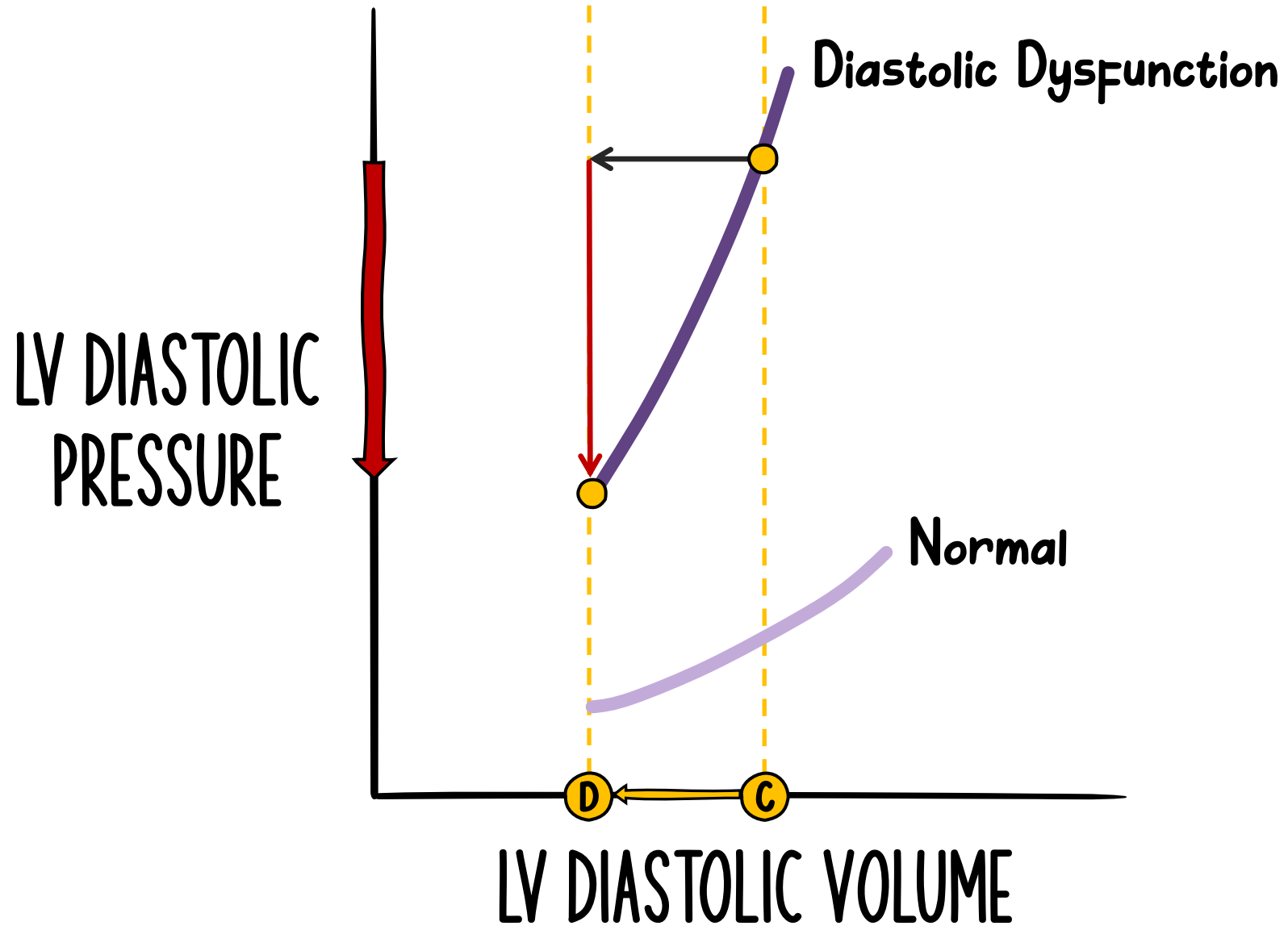
Preload Problem 2
Low RV CO
vs
High PVR

MAP

Capillaries







Right Heart

Left Heart

Vena Cava

Pulmonary Arteries

Aorta

Stressed volume

RV CO

PVR

LV preload

LVEDP

LV CO

SVR

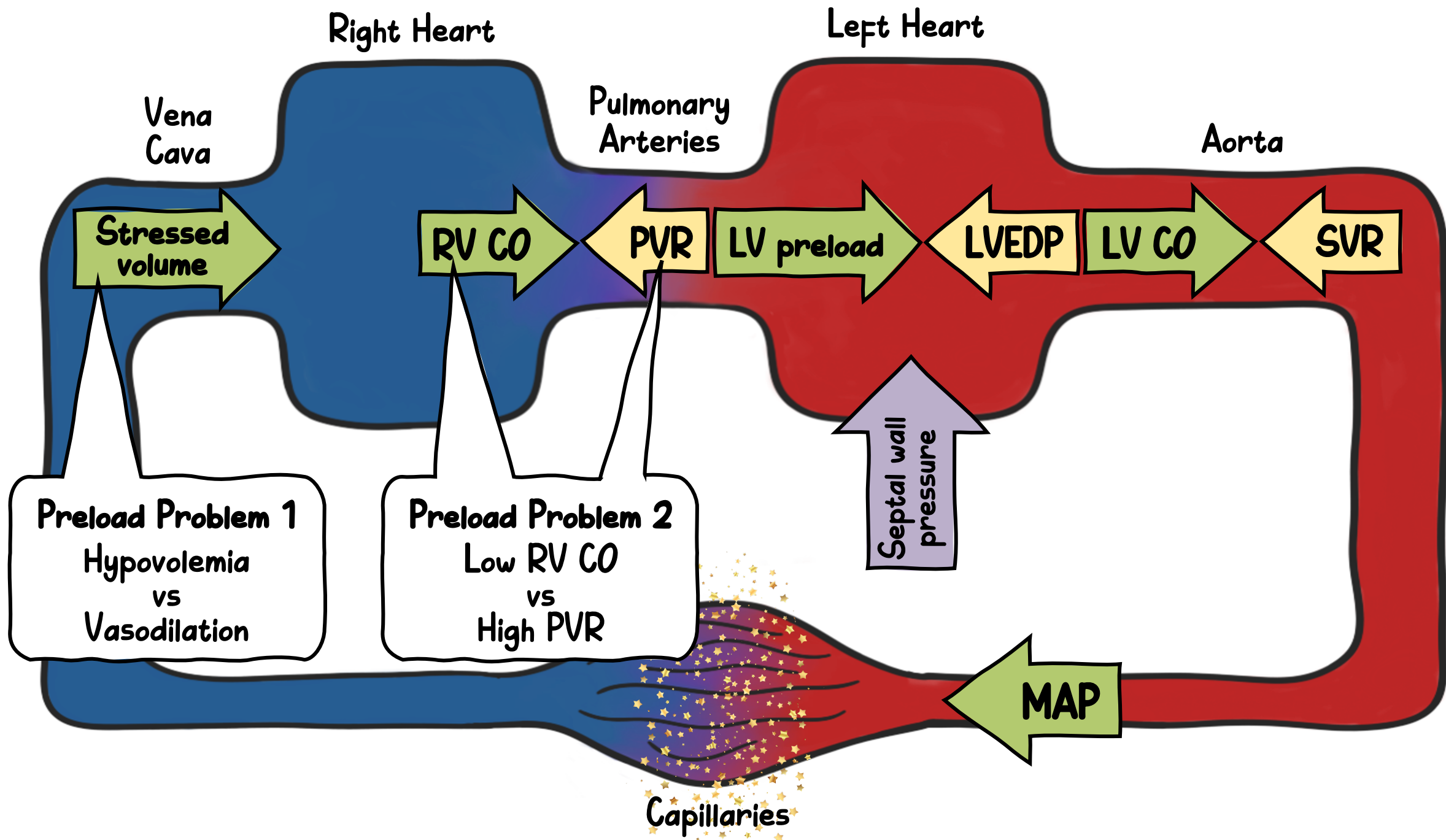
Preload Problem 1
Hypovolemia
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Preload Problem 2
Low RV CO
vs
High PVR

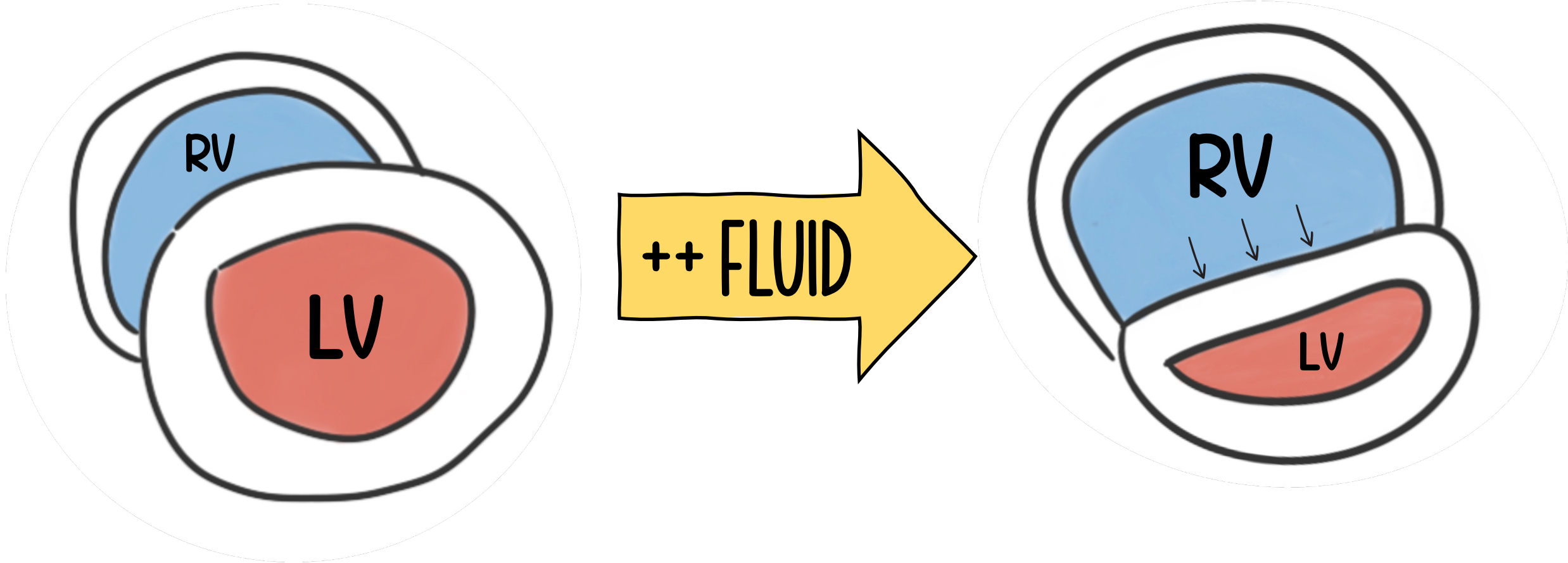
Septal wall
pressure

MAP

Capillaries



VENTRICULAR INTERDEPENDENCE



Right Heart

Left Heart

Vena Cava

Pulmonary Arteries

Aorta

Stressed volume

RV CO

PVR

LV preload

LVEDP

LV CO

SVR

Preload Problem 1
Hypovolemia
vs
Vasodilation

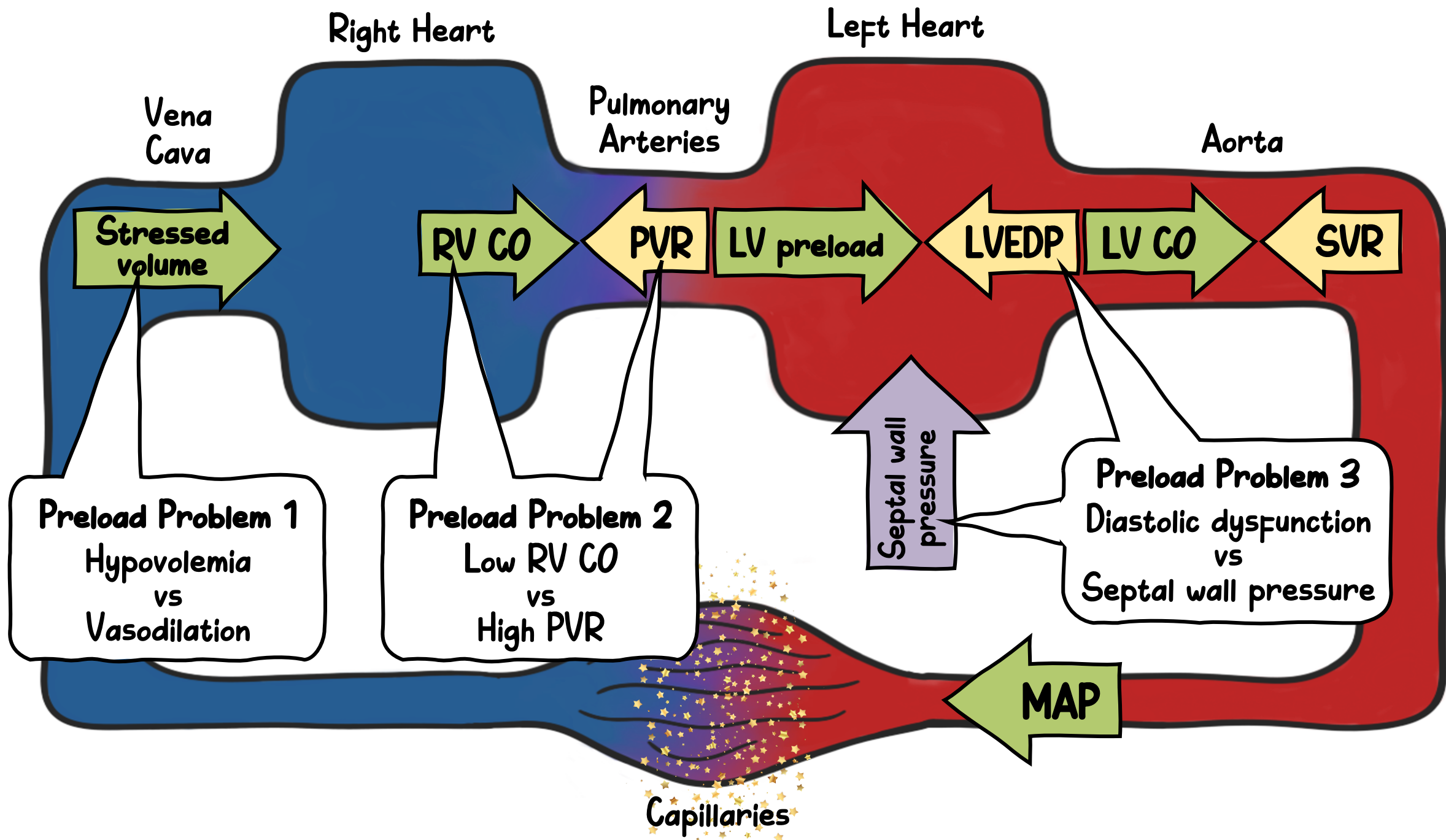
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Low RV CO
vs
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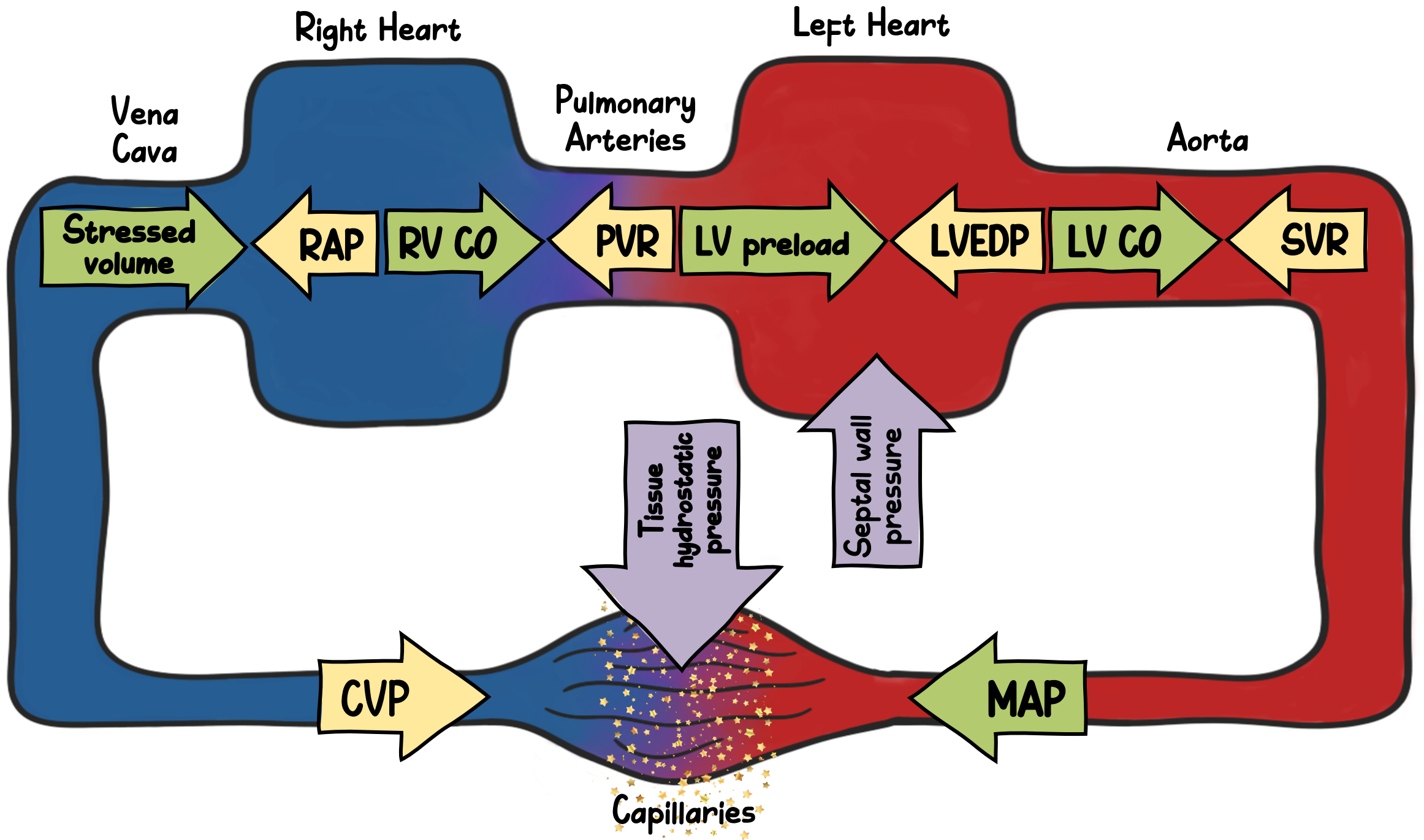
Septal wall pressure

Preload Problem 3
Diastolic dysfunction
vs
Septal wall pressure

MAP

Capillaries

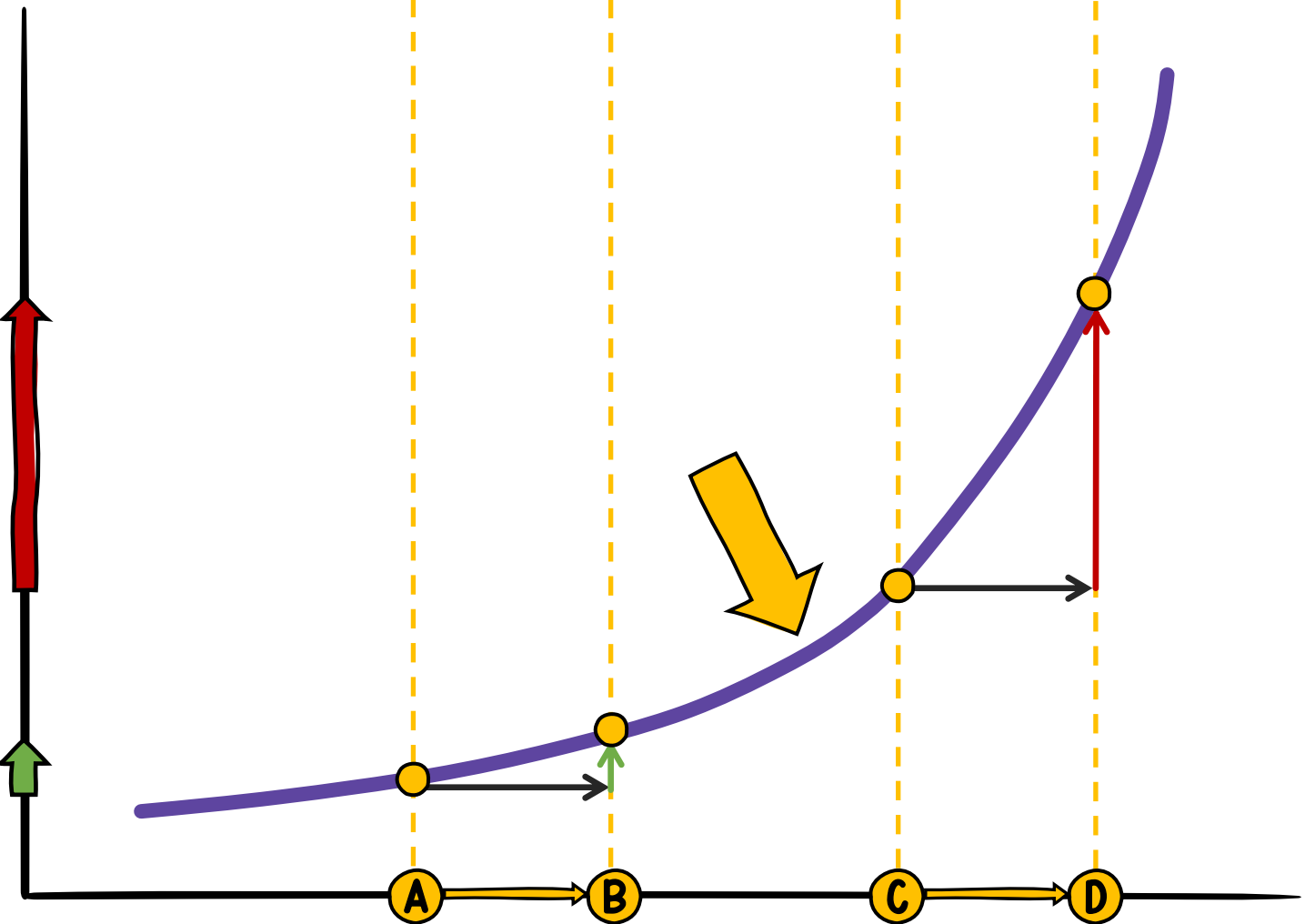




TISSUE HYDROSTATIC PRESSURE

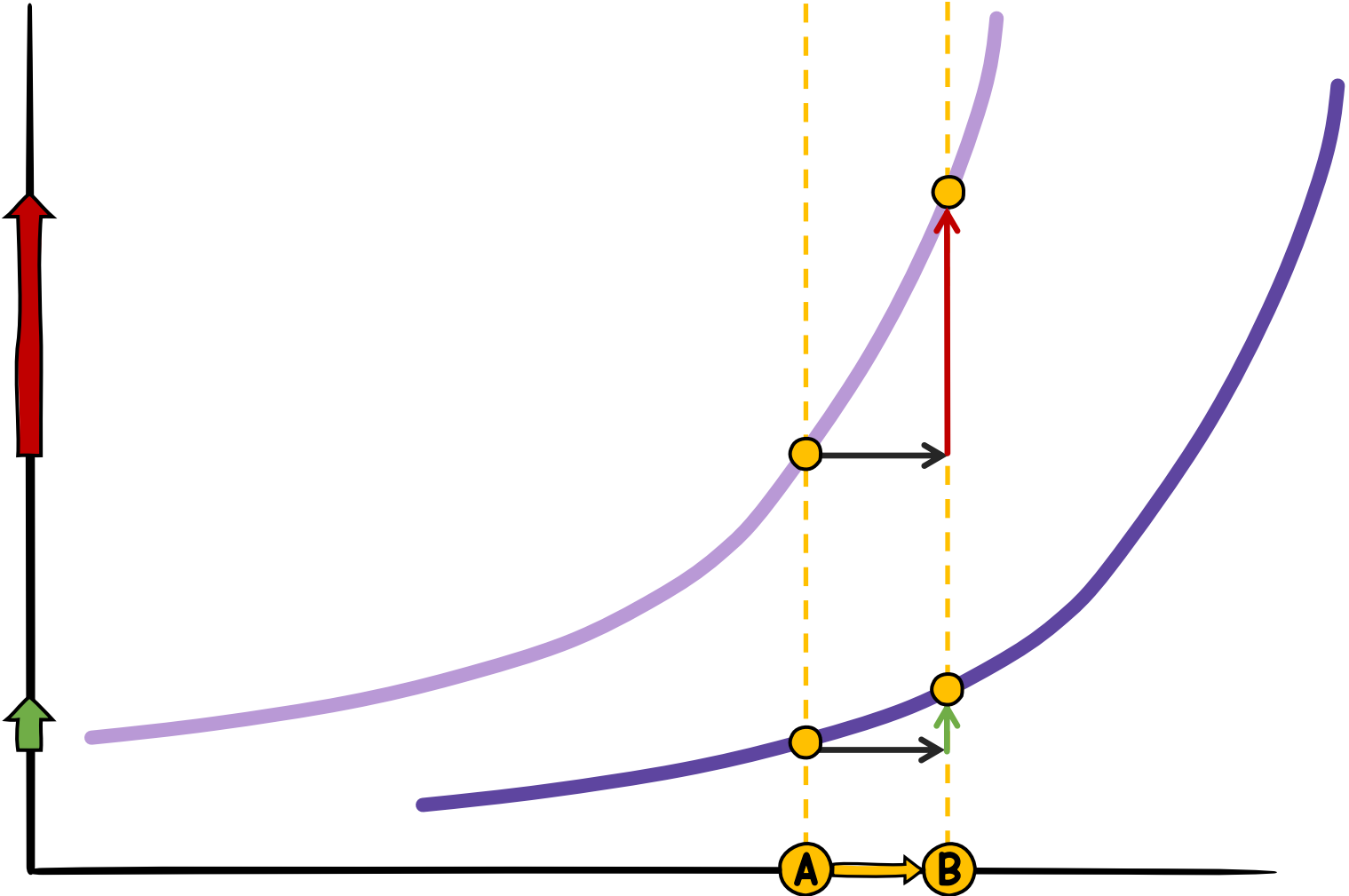


EXTRAVASCULAR
FLUID



PRELOAD

EXTRAVASCULAR
FLUID

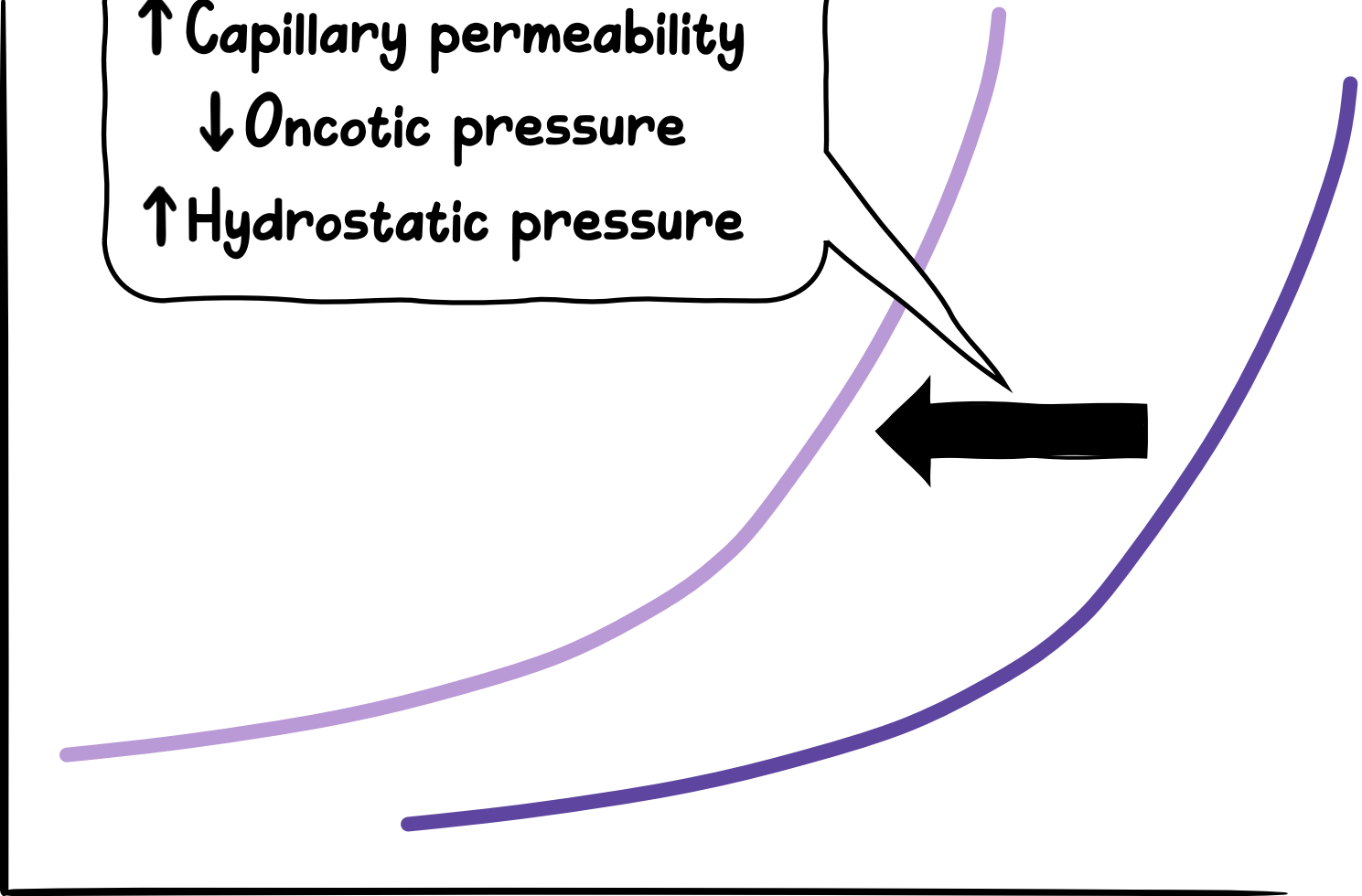


PRELOAD

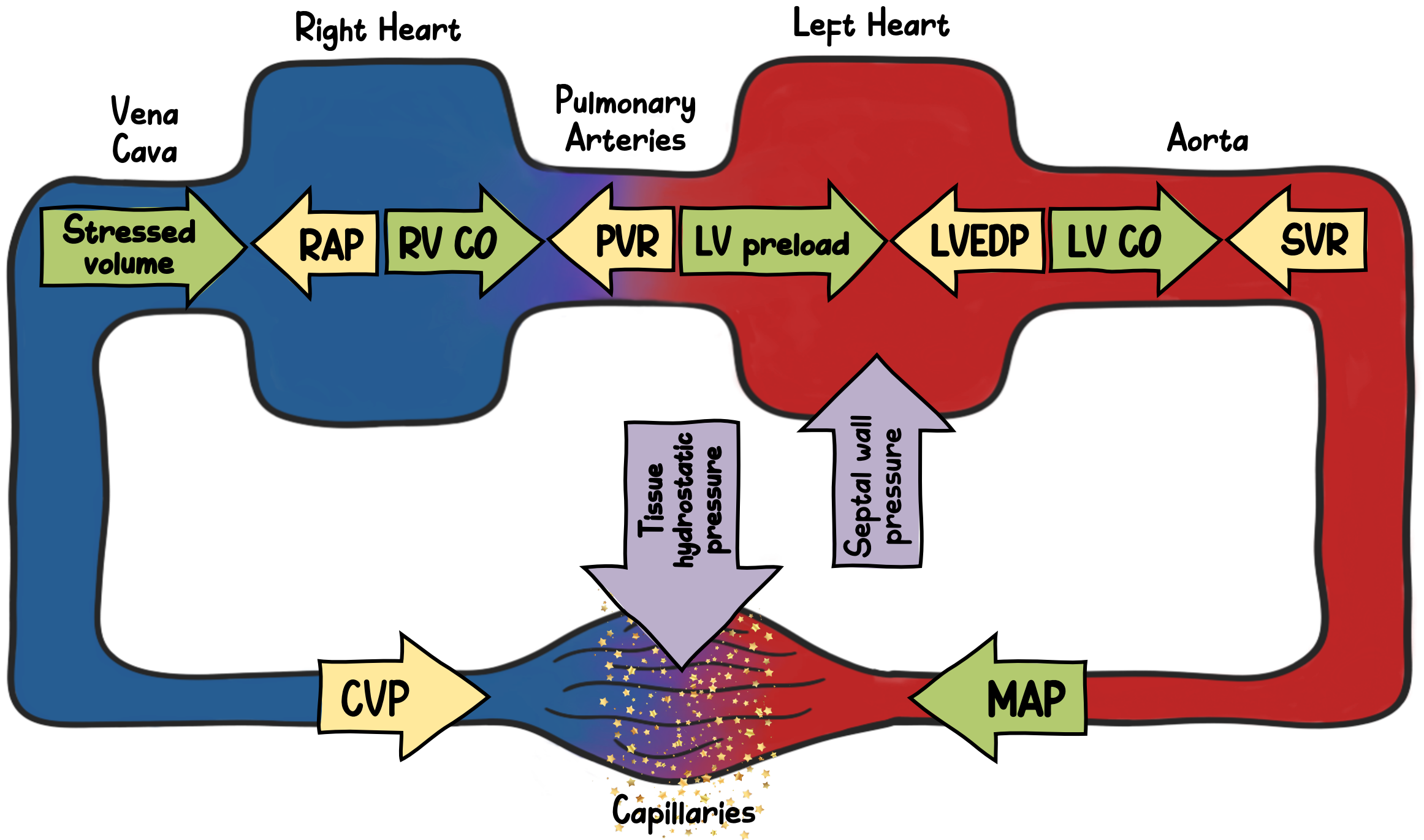
A B

EXTRAVASCULAR
FLUID

↑ Capillary permeability
↓ Oncotic pressure
↑ Hydrostatic pressure



PRELOAD

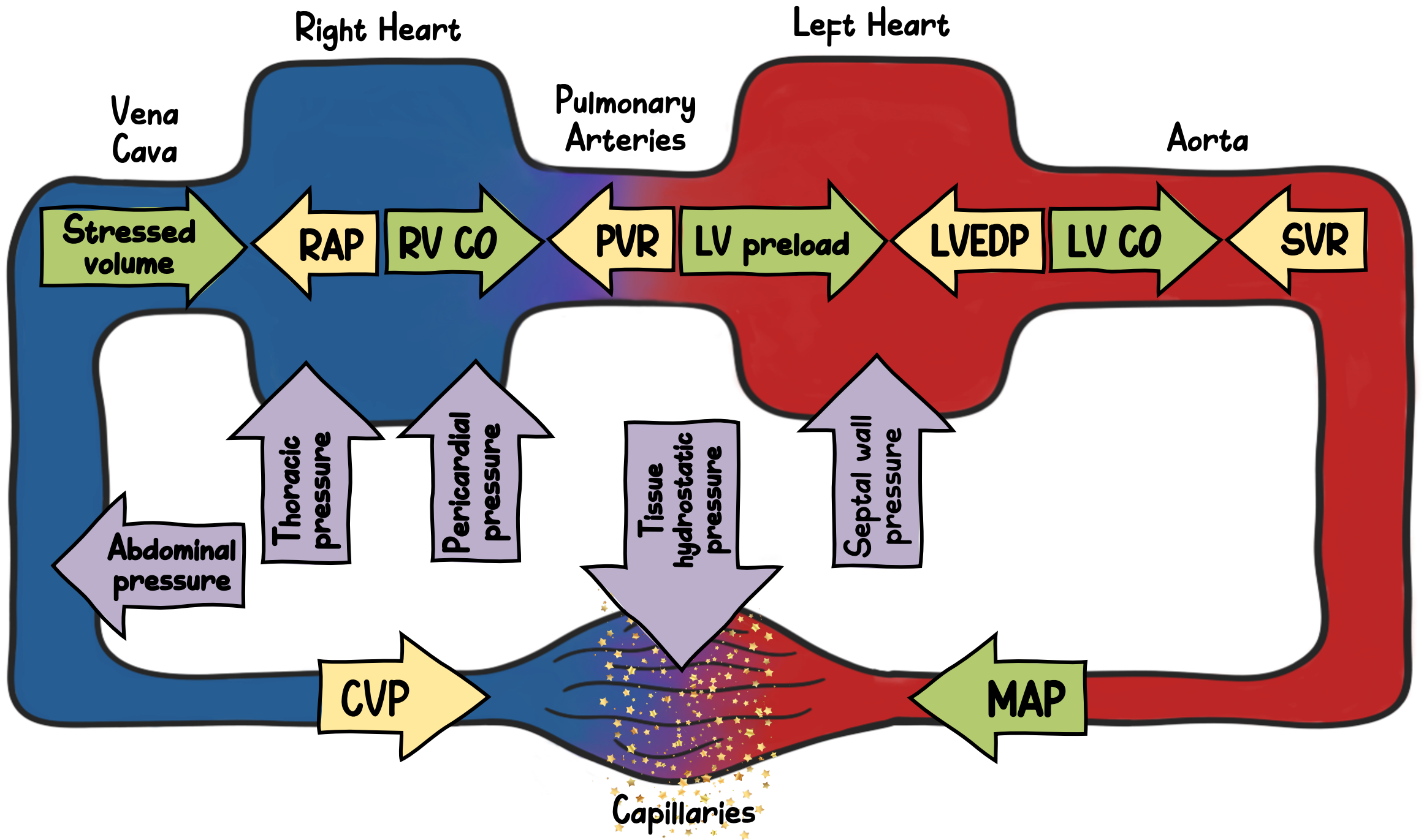


CARDIAC TAMPONADE

TENSION PNEUMOTHORAX

ABDOMINAL COMPARTMENT
SYNDROME





INSUFFICIENT FORWARD
PRESSURE...

...OR EXCESSIVE BACK
PRESSURE?





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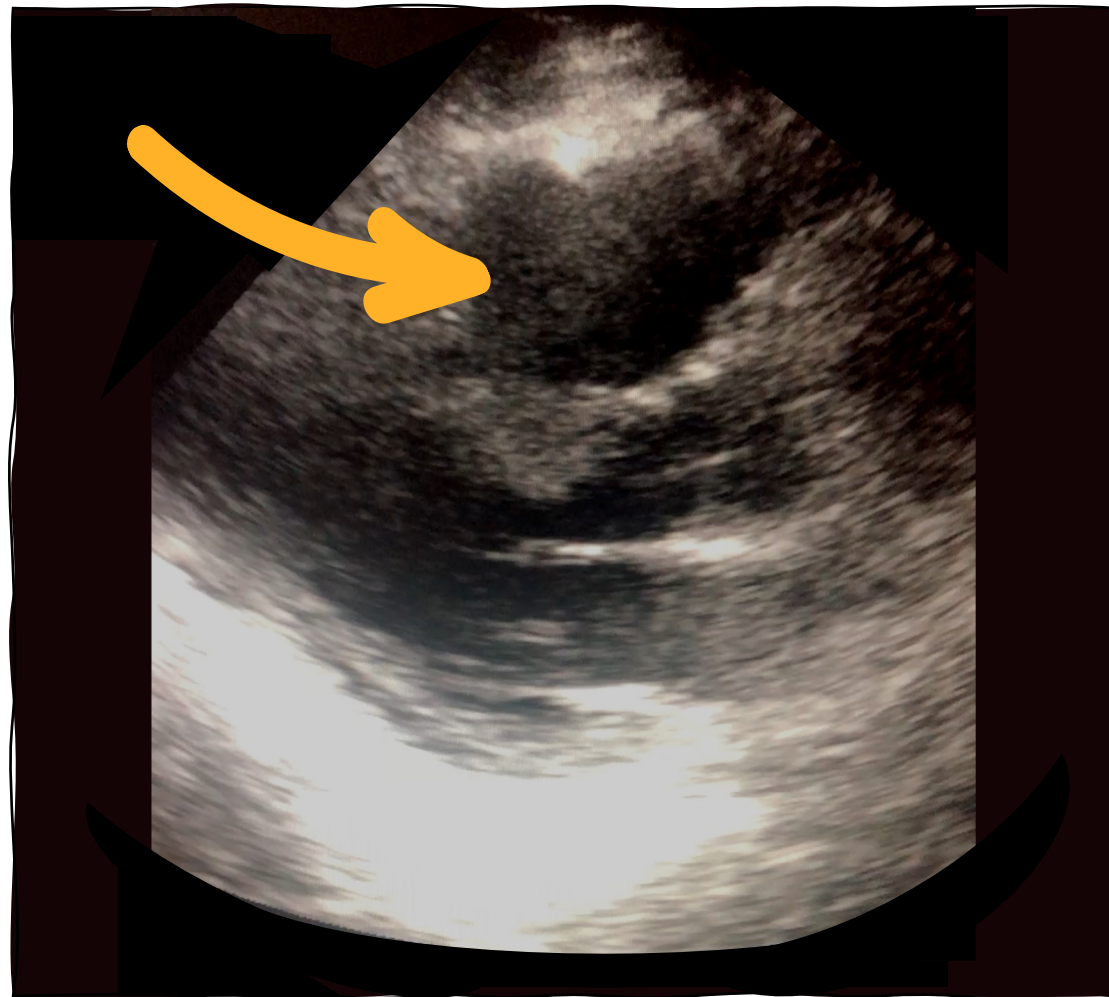
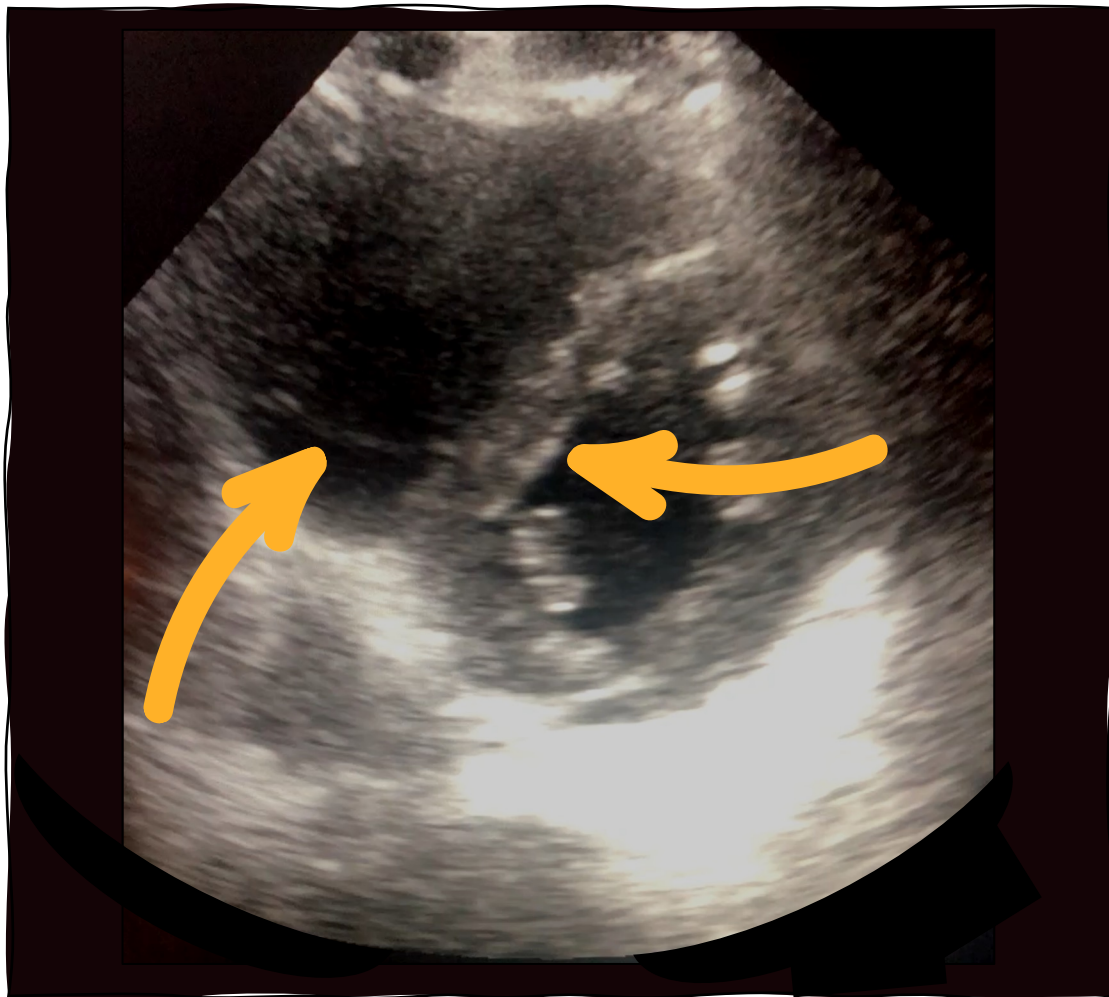
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Ms. Jones: 43F with AMS and abdominal pain



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**Radiology
calling with
critical
result**

CT Abdomen/Pelvis

1. Moderate volume ascites and hepatomegaly.
2. Severe cardiomegaly with evidence of right heart strain and reflux of contrast from the right heart into the hepatic veins and IVC.

Clinical correlation advised.

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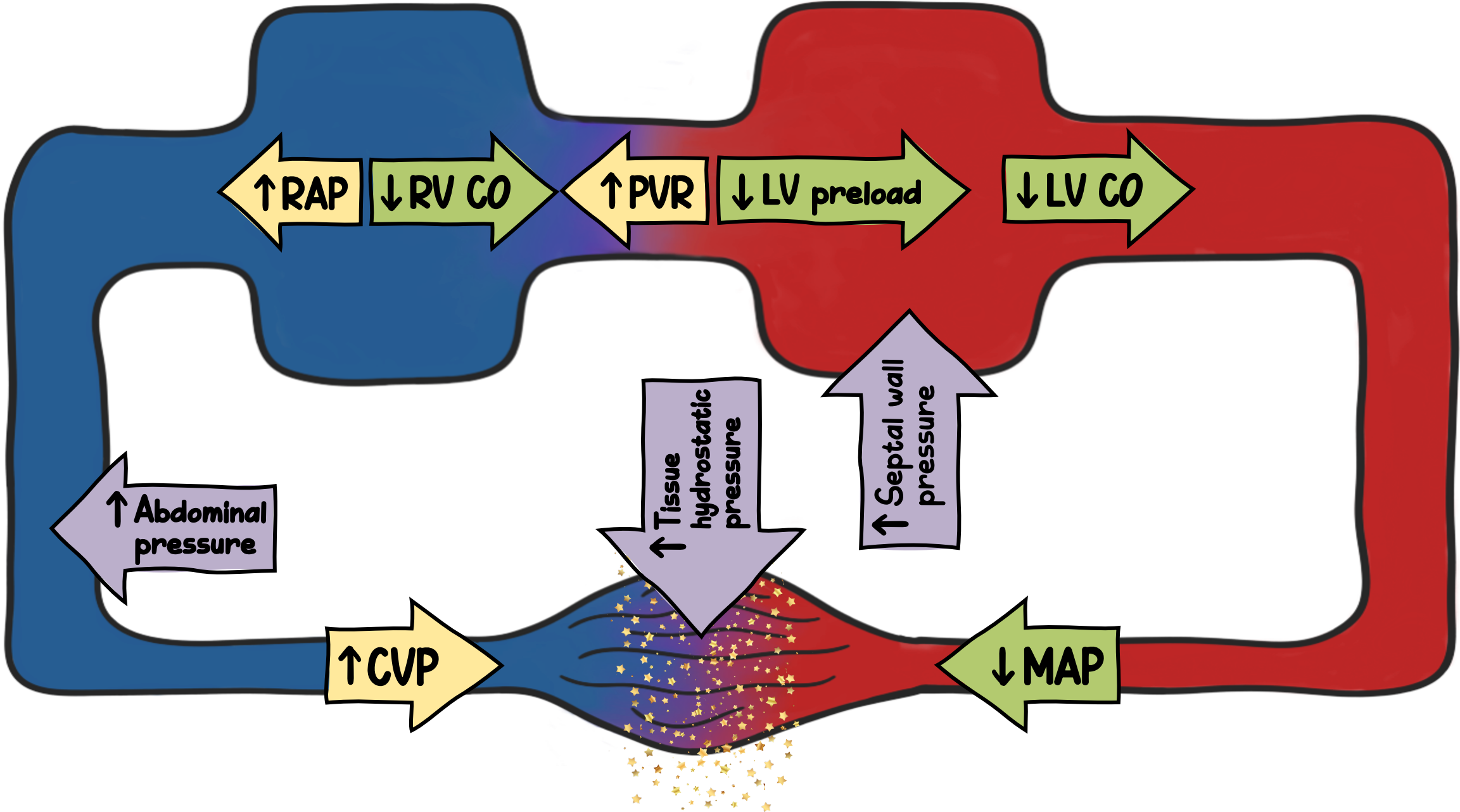
~~**Hypothesis A:**~~

Septic shock, likely due to abdominal sepsis

 **Hypothesis B:**

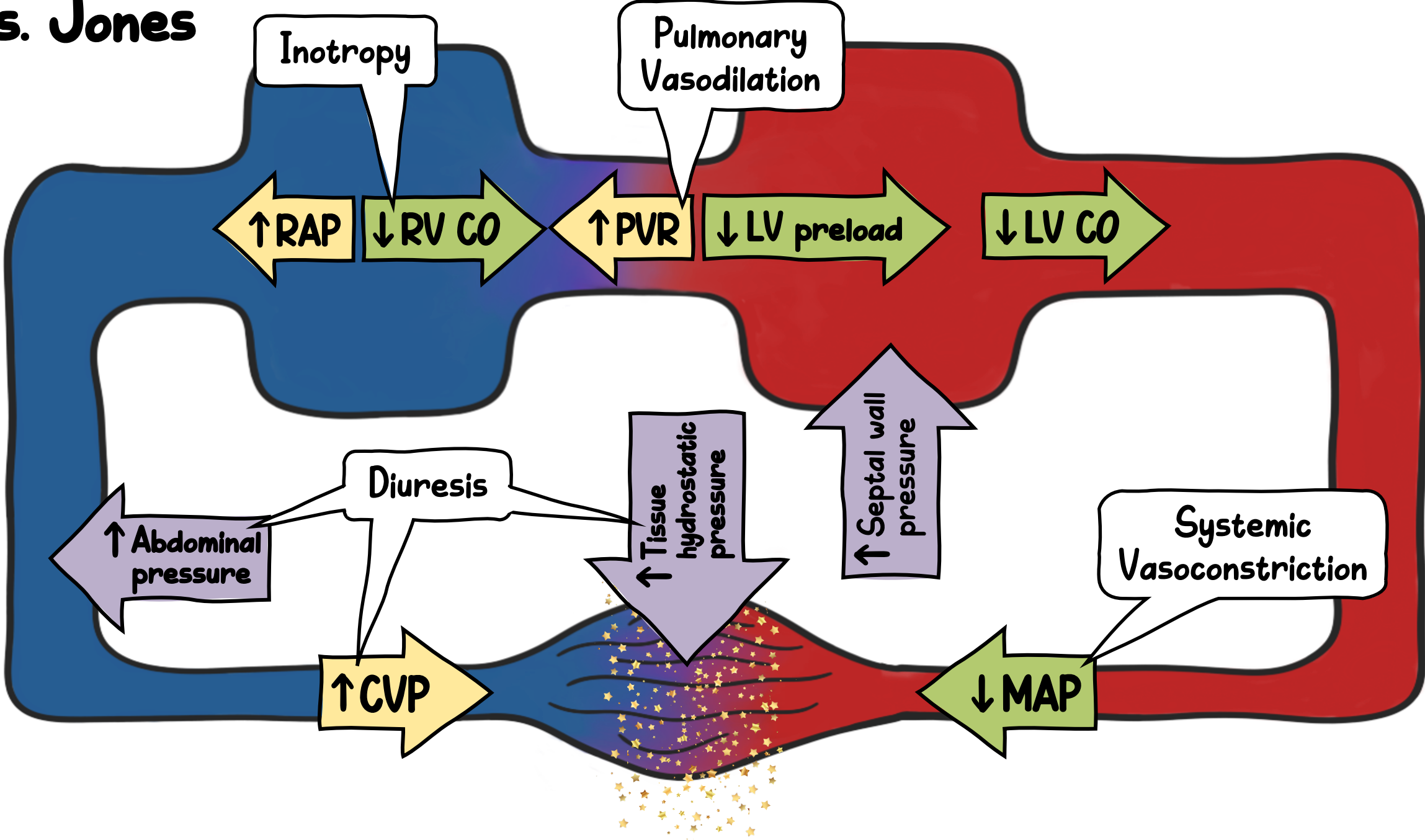
Cardiogenic shock due to acute RV failure from pulmonary hypertension with congestive hepatopathy

Ms. Jones



	<u>VASOCONSTRICTION</u>	<u>INOTROPY + VASOCONSTRICTION</u>	<u>INOTROPY + VASODILATION</u>
Adrenergic	Phenylephrine 	Norepinephrine 	Dobutamine
Vasopressin 1+2	Vasopressin 	Epinephrine 	Milrinone
AT1 + RAAS	Angiotensin II 	Dopamine 	

Ms. Jones



Ms. Jones: 43F with AMS and abdominal pain

- ✓ Epinephrine
- ✓ Lasix
- ✓ Inhaled epoprostenol



BP now 123/81.
patient requesting
a sandwich.

Can you place
a diet order?