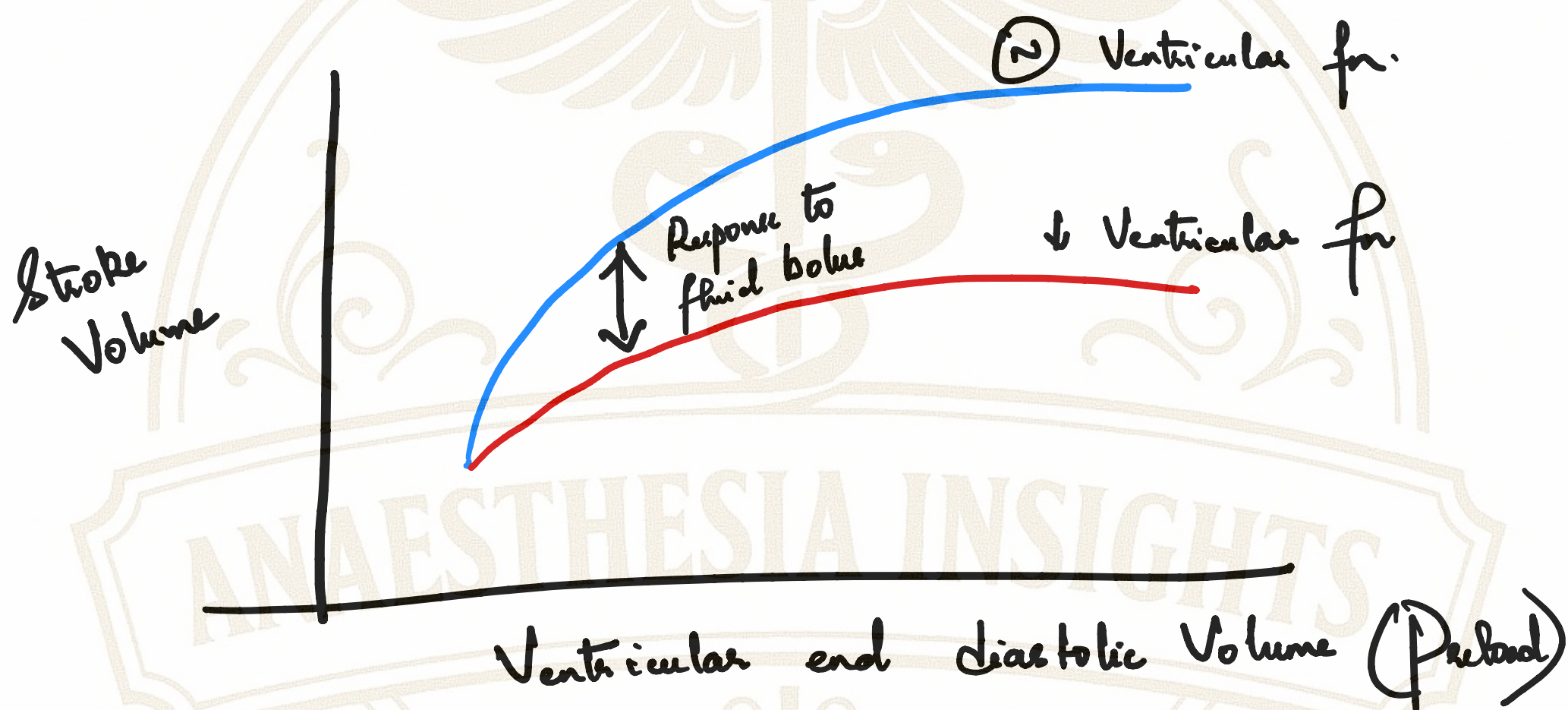


Q. TESTS FOR FLUID RESPONSIVENESS

- Fluid responsiveness is a state where administration of fluid will lead to improvement in stroke volume & hence cardiac output.
- Increasing preload increases stroke volume only if the heart is on the steep part of Frank-Starling curve



Tests that depend on heart-lung interactions

[A] Respiratory variations in stroke volume

- Parameters that work on heart-lung interaction are systolic pressure variation (SPV), stroke volume variation (SVV) & pulse pressure variation (PPV)
- Prerequisites to use PPV are
 - Mechanically ventilated pt.
 - Tidal Volume $\geq 8 \text{ ml/kg}$ PBW

- Without spontaneous breathing activity
- Sinus rhythm.

- Falsely high PPV: (R) Ventricular dysfunction
- Falsely low PPV: low TV
poor pulmonary compliance
low ratio of heart rate to RR
 < 3.6
High frequency ventilation

* Tidal Volume Challenge Test: simple bedside test

- ↑ TV from 6 mL/kg predicted BW to 8 mL/kg PBW for 1 min. & reducing back TV back to 6 mL/kg & observing change in PPV & SVV.
- An ↑ in absolute value of PPV $> 3.5\%$
& SVV $\geq 2.5\%$ predicts fluid responsiveness.

* End-expiratory Occlusion test: (EEOT)

- Done by giving expiratory pause for 15 sec & looking for change in C.O using continuous C.O monitor.
- When C.O change is $> 5\%$, then the pt is a fluid responder.

- Used even in pts with poor compliance, high true end-expiratory pressure & cardiac arrhythmias.

* Echocardiography guided test for fluid responsiveness

- The changes in IVC, SVC & aortic root velocity during respiratory cycle predict fluid responsiveness.

* IVC & SVC variability

- During inspiration, intrathoracic pressure is transmitted to IVC causing distension of IVC when present on PPV & there will be a collapse of IVC when on spontaneous ventilation only when there is a preload dependency
- SVC variability is assessed by trans-oesophageal echocardiography (TOE)
- SVC collapse during PPV
SVC collapsibility Index $\geq 36\%$ } preload responsiveness

[B] PRELOAD CHALLENGE TESTS:

- * Passive leg raising test: an internal fluid challenge.
- Passive elevation of LL from semi-recumbent position.
- This allows transfer of venous blood from both lower limbs & from splanchnic circulation towards the heart & acts as internal fluid challenge.
- The amount of preload challenge produced by PLRT is ~ 300 ml

[C] FLUID CHALLENGE

- * Classical fluid challenge - giving a random fluid bolus of 300-500ml & see for changes in arterial pressure, central venous pressure
- * Mini fluid challenge:
 - Administer 100 ml of colloid in 1 min
 - ↓
 - Response assessed by change in ultraortic velocity time integral by TTE

↓
change of 10% in velocity time integral
predict fluid responsiveness (VTi)
(OR)

Administering 4 ml/kg of fluid x 5 mins

& observe a reliable change in mean
circulating filling pressure.

COMPONENTS OF BODY FLUIDS (Distribution of Body fluids)

