Fluid Management with Impedance Cardiography

I. Passive Leg Raising Test

II. Stroke Volume Variation
I. Passive Leg Raising Test

Preload change

Blood volume transfer to legs decreases preload

Blood volume transfer to intrathoracic compartment increases preload

Stroke Volume change

Frank Starling Curve

$\Delta SV$

$\Delta PL$

10 %

15 %

Preload (PL)

SV change over 15 %

Fluid responsive
I. Passive Leg Raising Test

1. semi-recumbent position
   - ICG measurement (1...3 min)

2. 45° passive leg raising
   - ICG measurement (1...3 min)

Analysing ICG results:
- SV change >15%: Fluid responsive *
- SV change <10%: Not fluid responsive

I. Passive Leg Raising Test
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LVET: 252 ms
VI: 63 1/1000/s
SV: 83 ml

LVET: 300 ms
VI: 74 1/1000/s
SV: 107 ml
II. Stroke Volume Variation (SVV)

Respiration affects:
- Heart Rate
- Blood Pressure
- Stroke Volume (SV)

SVV describes the variation of SV during expiration to inspiration and is a predictor of preload responsiveness

Restrictions:
- Only possible in ventilated patients with tidal volumes of $\geq 8\text{cc/kg}$
- Arrhythmias adversely reduce accuracy of SVV

SVV over 15 % Fluid responsive
II. Stroke Volume Variation

Respiration cycle:
II. Stroke Volume Variation

Only ICG provides information about:

• Heart rate
• Stroke volume
• Respiration

Example: Artificial respiration