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:

SV change over 15% Fluid responsive

Stroke Volume change diagram: Frank Starling Curve, ΔSV, ΔPL
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 ≥ 8cc/kg
- Arrhythmias adversely reduce accuracy of SVV

Example: ICG amplitude modulation (red wave) by respiration (blue wave):

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