Passive Leg Raise
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Objectives
• Define passive leg raise
• Recognize indications and contraindications for passive leg raise
• Perform passive leg raise
• Identify if passive leg raise shows fluid responsiveness in a patient

What is Passive Leg Raise?
• Passive leg raise or “PLR” is a simple mechanical maneuver used to determine whether a patient will be fluid responsive
• PLR is done by elevating the legs of a patient to a 45 degree angle

How does it work?
• Passive leg raises mimics the effect of fluid by shifting peripheral venous blood to the core of the patient
• The blood transferred is measured to be about 150 mL
• PLR increases venous return and thus increases right cardiac preload

What are we measuring?
• The increased venous return effects stroke volume (SV) and thus effects cardiac output (CO)
• Stroke volume can be measured by monitoring CO
  – Additionally, pulse pressure from an arterial line positively correlates to SV
• An increase in stroke volume by 10% or more will show that the patient would be fluid responsive
  – Sensitivity of 97% and a specificity of 94%

Measuring Cardiac Output & Stroke Volume
• TEE and TTE
  – Minimally invasive
  – Does not provide continuous CD monitoring
  – Requires calculations and advanced training to determine CD
• FloTrac (EV 1000)
  – Continuous monitoring of CO
    • Requires an arterial line
• Swan-Ganz/ PA Catheter
  – Continuous CO monitoring
    • Requires catheter placement and can be somewhat more invasive

Why PLR?

- It's reversible!
  - Fluid is often given when there are signs of hypoperfusion in a critically ill patient
  - Only about 50% of patients respond to fluid administration with an increase in stroke volume
  - Giving unnecessary fluid to critically ill patients is often contraindicated and may result in pulmonary edema
- It's quick and easy!
  - Requires a simple bed maneuver
  - Data can be collected and fluid responsiveness can be determined within minutes


Indications – When to think about PLR?

- Hypotension
- Low urine output
- Elevated lactate
- CAN be used in patients with arrhythmias
- CAN be used in patients who are mechanically ventilated


Contraindications

- Use caution in agitated patients
  - Pain, movement, and agitation can skew results
- Aspiration risk
- Increased intracranial pressure (ICP)
- May be contraindicated in patients who are considered too unstable to lie flat

Performing PLR

- Sit patient in a semi fowlers position with head of bed at a 45 degree angle
- Assess baseline stroke volume by looking at cardiac output or pulse pressure
- Lie patient into a supine position and raise legs to a 45 degree angle
- The maximum effect of the fluid shift should be seen within 30-90 seconds of performing the maneuver
- Assess stroke volume while performing PLR


Performing PLR


References

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