Positioning of Arterial Line Transducer at the Phlebostatic Axis

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BACKGROUND

• Arterial lines are used in critical care patients to invasively monitor hemodynamic status
• Vasoactive drugs are usually titrated based on arterial line readings
• Currently, arterial lines are zeroed to atmospheric pressure with the transducer placed on the forearm
• Phlebostatic axis is regarded as the anatomical point that corresponds to the right atrium and most accurately reflects a patient’s hemodynamic status

PURPOSE

• To determine the placement of the arterial line transducer that most accurately reflects a patient’s hemodynamic status
• For critical care patients who require invasive hemodynamic monitoring
• Comparison between two arterial line transducer positions:
  – Zeroed at the phlebostatic axis
  – Zeroed at the forearm (current practice)

EVIDENCE

• Phlebostatic axis is located at the fourth intercostal space at the mid-anterior-posterior diameter of the chest wall. This is the location of the right atrium.
• Physiologic indifferent point as changes in patient position and volume shifts will not affect the reading.
• If the stopcock is positioned below the phlebostatic axis, the readings will be inaccurately high
• If above the phlebostatic axis, the readings will be inaccurately low.

DATA COLLECTION

Data collection in the NSICU included patient age, gender, cardiac history and three blood pressure readings:

- A-line • Zeroed at the phlebostatic axis
- A-line • Zeroed at the forearm
- Dynamap • Cuff reading on either arm

OUTCOMES

• Disparities among three different readings
• Mixed results with some patients requiring vasopressor support or vasodilator support, depending on ordered blood pressure parameters.

NEXT STEPS

• Position arterial line transducers at the phlebostatic axis, as evidence suggests
• Monitor any increase/decrease in usage of vasoactive drug with new positioning

REFERENCES