Positioning of Arterial Line Transducer at the Phlebostatic Axis

Jaclyn M. Freddo BSN, RN  
*Lehigh Valley Health Network, jaclyn_m.freddo@lvhn.org*

Rency Mathew BSN, RN  
*Lehigh Valley Health Network, Rency.Mathew@lvhn.org*

Jessica Mundo BSN, RN  
*Lehigh Valley Health Network, jessica.mundo@lvhn.org*

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Jaclyn Freddo, BSN, RN, Rency Mathew, BSN, RN, and Jessica Mundo BSN, RN
Lehigh Valley Health Network, Allentown, Pennsylvania

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:

<table>
<thead>
<tr>
<th>Transducer</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-line</td>
<td>Zeroed at the phlebostatic axis</td>
</tr>
<tr>
<td>A-line</td>
<td>Zeroed at the forearm</td>
</tr>
<tr>
<td>Dynamap</td>
<td>Cuff reading on either arm</td>
</tr>
</tbody>
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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


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