

Are Pulse Volume Recordings Still Relevant?

Tom Hargens, RT(R), RVT

Yes, **Pulse Volume Recording (PVR) waveforms** remain relevant in the vascular lab as an important diagnostic tool for assessing peripheral vascular disease. Although advancements in imaging technologies like duplex ultrasonography and CT/MR angiography have become more prevalent, PVR waveforms offer unique advantages, particularly in certain clinical scenarios. Here's why they are still relevant:

Advantages of PVR in the Vascular Lab

1. **Assessment of Global Limb Perfusion:**
 - PVR measures segmental changes in volume, providing an overall assessment of blood flow to the entire limb.
 - This complements imaging studies that focus on anatomical details but may not provide a functional assessment of limb perfusion.
2. **Non-Invasive and Quick:**
 - PVR is simple to perform and does not require extensive patient preparation, contrast agents, or ionizing radiation.
 - It is particularly useful in patients who cannot tolerate more invasive or imaging-based studies.
3. **Segmental Evaluation:**
 - By placing cuffs at different levels (e.g., thigh, calf, ankle, foot), PVR allows clinicians to localize the level of arterial occlusion or stenosis.
 - This is critical for planning interventions or surgeries.
4. **Evaluation of Microvascular and Collateral Circulation:**
 - PVR waveforms can provide insights into the condition of collateral circulation and the small vessel contribution, which imaging may miss.
5. **Utility in Non-Compressible Arteries:**
 - In patients with calcified, non-compressible arteries (e.g., diabetics or those with end-stage renal disease), PVR remains a reliable way to evaluate perfusion when ankle-brachial index (ABI) readings may be inaccurate.
6. **Post-Intervention Monitoring:**
 - PVR can be used to monitor the effectiveness of vascular interventions (e.g., bypass surgery or endovascular procedures) over time.
7. **Application in Specific Patient Populations:**
 - PVR is particularly helpful for patients with limited mobility or contraindications to advanced imaging studies.
 - It is also useful in outpatient or rural settings where advanced imaging might not be readily available.

Limitations of PVR

1. Reduced Sensitivity:

- PVR does not provide detailed anatomical information, which is essential in some cases for pre-surgical planning or identifying exact lesion locations.

2. Operator Dependency:

- Proper placement of cuffs and interpretation of waveforms require training and expertise to ensure accurate results.

3. Impact of Edema or Obesity:

- PVR waveforms can be dampened by soft tissue abnormalities, such as edema or significant obesity.

Summary

Pulse Volume Recording remains a relevant and valuable diagnostic tool in vascular labs. While it does not replace advanced imaging techniques, it serves as a functional, non-invasive, and efficient method to assess peripheral vascular disease, especially in specific patient populations or scenarios where anatomical imaging alone may fall short.