

Opiniones y noticias

Should Arterial Lines Remain Routine in Shock? A Nursing Viewpoint

¿Deberían seguir siendo rutinarias las vías arteriales en casos de shock?
Una perspectiva de enfermería

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Arterial lines remain a mainstay in intensive care units for continuous blood pressure monitoring (figure 1), frequent arterial blood sampling including blood gases, connection to pulse contour analysis devices for advanced hemodynamic parameters such as stroke volume, cardiac output, and pulse pressure variation, and guidance during cardiopulmonary resuscitation. The EVERDAC trial by Muller et al. challenges routine placement, showing that in critically ill patients with shock, deferring arterial catheterization and using initial noninvasive monitoring with an automated brachial cuff was noninferior to early invasive monitoring for 28-day mortality (34.3% versus 36.9%; adjusted risk difference, -3.2 percentage points; 95% CI, -8.9 to 2.5).¹ Strikingly, only 14.7% of patients in the noninvasive group required later arterial line insertion, while the invasive group experienced higher rates of hematoma or hemorrhage (8.2% versus 1.0%). Device-related pain or discomfort was slightly more common in the noninvasive group (13.1% versus 9.0%), but secondary outcomes, including Sequential Organ Failure Assessment score evolution, ventilator-free days, and 90-day mortality (42.7% versus 44.0%), showed no significant differences.¹

These results raise a pivotal question for intensive care practice: should arterial lines cease to be used routinely in patients with shock? From a bedside nursing viewpoint, the evidence supports a shift toward a noninvasive-first approach for most patients, with selective use of invasive monitoring. This strategy reduces procedural risks, catheter-related in-

fections, and unnecessary interventions, potentially easing nursing workload associated with line maintenance and complication management. However, implementation requires nuance. Deferring catheterization may increase tasks such as more frequent venous or arterial punctures for laboratory testing, as observed in EVERDAC with higher puncture rates in the noninvasive arm. Repeated cuff inflations can lead to bruising, skin irritation, sleep disruption in sedated or awakening patients, and occasional interference with pulse oximetry readings on the same arm. These cumulative effects could heighten overall nursing burden, influence protocol adherence, and contribute to staff fatigue, aspects underexplored in the trial but central to daily bedside care.

Physiological evidence reinforces the feasibility of this approach. Meta-analyses confirm that oscillometric noninvasive monitoring shows minimal bias in mean arterial pressure compared with invasive methods (-1.5 mm Hg; 95% CI, -3.34 to 0.35), though with wide limits of agreement and frequent underestimation of systolic pressure (differences ≥ 10 mm Hg in about half of measurements for systolic and one-third for mean arterial pressure)^{2,3}. While clinical relevance of these discrepancies varies, they appear acceptable for many patients, particularly those not requiring ultra-precise titration.

EVERDAC's exclusions limit broad application: patients on extracorporeal membrane oxygenation, those needing vasopressors exceeding 2.5 $\mu\text{g/kg/min}$ (norepinephrine tartrate



Figure 1. Radial arterial catheterization.

plus epinephrine equivalents), severe traumatic brain injury, or body-mass index >40 were not included, indicating that routine de-escalation remains inappropriate for these subgroups where precise, continuous data may be critical. Early commentaries on the trial echo this, advocating selective rather than universal abandonment of arterial lines while highlighting reduced harms in eligible populations.⁴

To translate EVERDAC into sustainable practice, future research must prioritize nurse-reported outcomes, including workload quantification, intervention feasibility, and barriers to adherence, alongside patient-centered metrics such as sleep quality, limb discomfort, and mobility. Integrating nursing input into protocol development and guideline updates could promote multidisciplinary adoption of less invasive monitoring, enhancing patient safety, resource allocation, and bedside efficiency in intensive care units.

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