

Administration of vasopressors through peripheral venous catheters

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1 Early administration of vasopressors in patients with septic shock improves patient outcomes

Despite advancements in sepsis management, mortality rates remain high. In 2011, 1 in 18 deaths in Canada involved sepsis.¹ Delays in achieving adequate mean arterial pressure (MAP) are associated with increased mortality.² Therefore, the Surviving Sepsis Campaign guideline recommends prioritizing treatment of low MAP through vasopressors given peripherally, rather than waiting for placement of a central venous catheter.³

2 When central venous access cannot be established delivering vasopressors via peripheral catheters is acceptable

Administration of vasopressors through peripheral venous catheters has traditionally been avoided given concerns of extravasation, limb ischemia and tissue necrosis.⁴ However, placement of central venous catheters requires special training, can be time consuming and can delay vasopressor initiation. In addition, central line insertion and maintenance can cause complications like pneumothorax (2.1%), catheter-related bloodstream infection (0.5%–1.4%) or deep vein thrombosis (0.5%–1.4%).⁵

3 Extravasation injury from vasopressors given through a peripheral catheter is uncommon

A meta-analysis of 16 055 patients treated with peripherally administered vasopressors reported an incidence of adverse events (i.e., extravasation, limb ischemia and necrosis) of 1.8% (95% confidence interval 0.1%–4.8%). The incidence did not differ significantly according to vasopressor type, or catheter location or gauge.⁵ Since 1 study found that extravasation was more likely with catheters placed below the antecubital fossa, placing the peripheral catheter as proximally as possible seems appropriate.⁴ Most extravasation events happened 6–50 hours after the infusion was started. Serious complications were uncommon even when extravasation occurred.^{4,5}

4 Risks of extravasation can be minimized with a few simple steps

If extravasation occurs, clinicians should stop the infusion immediately but not remove the catheter. While the vasopressor infusion is restarted through a new access site, the drug should be aspirated through the original catheter. The catheter can then be removed while aspiration is taking place. Phentolamine should be injected subcutaneously along the edges of the extravasation area. Surgical evaluation should be considered.^{4,5}

5 Institutional protocols should be considered when using peripheral vasopressors

Institutional protocols may contribute to the low incidence of complications. We propose an algorithm for clinical monitoring and management of extravasation in adult patients based on the limited published data and our clinical experience (Appendix 1, available at www.cmaj.ca/lookup/doi/10.1503/cmaj.211966/tab-related-content).^{4,5}

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