PERIPHERAL INFUSION OF VASOPRESSORS

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DISCLOSURE

I do not have any relevant relationships with a commercial interest organization.

OBJECTIVES

- The purpose of todays presentation is to provide attendees of the Clinical Nursing Conference with the latest evidence on the infusion of peripheral vasopressors.

- At the end of a 25 minute presentation, the attendee will be able to:

1. State the 4 variables outlined in the evidence to support the safe administration of peripheral vasopressors.
2. Describe an evidence-based protocol for safe administration of peripheral vasopressors.
3. Review the findings from the implementation of an evidence-based practice project.

Reflection

(Woodward, n.d.)

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Why change now?

- Evidence supporting the requirement of a central line for the infusion of vasopressors was published prior to 1970.
- There have been significant improvements in IV equipment and insertion techniques.
- Peripheral IV administration may reduce the time required to achieve hemodynamic stability.
- Central venous catheters are not benign and can contribute to mortality and morbidity.

(Loubani & Green, 2015; Polderman & Girbes, 2002a, Polderman & Girbes, 2002b, Ricard et al., 2013)

A systematic review of extravasation and local tissue injury from administration of vasopressors through peripheral intravenous catheters and central venous catheters☆,☆☆

Osama M. Loubani, MD, FRCPC [a,*], Robert S. Green, MD, FRCPC [a,b]

Variables	Tissue Injury Group N=204
Location	Distal to antecubital and popliteal fossa
Duration	55.9 hours ± 68.1 hours
Medication	Norepinephrine 80%, Dopamine 9%, Vasopressin 7%

- Case reports or case series
- In emergency situations, short-term administration via a proximal, well placed IV is unlikely to cause tissue injury.

(Loubani & Green, 2015)

Safety of the Peripheral Administration of Vasopressor Agents

Tyler Lewis, PharmD[1], Cristian Merchan, PharmD, BCCCP[1], Diana Altshuler, PharmD, BCPS, BCCCP[1], and John Papadopoulos, PharmD, FCCM, BCCCP, BCNSP[1]

Variables	
Location	Forearm 43%, Antecubital 32%, Hand 24%, Other 1%.
Duration	Median 19 hours, Median 11.5 (transition to CVC)
Medication	Norepinephrine 72%, Phenylephrine 36%, Epinephrine, Vasopressin, Dopamine 4%. Drug concentrations varied.
Catheters	20g 44%, 22g 30%, 18g 14%, Other/Unknown 12%

- Extravasation rate 4% (n=8) with a median time to extravasation of 21 hours.
- All extravasations were treated with conservative management.
- Vasopressor therapy may now be more of a relative indication for CVC. Further research is required. Recommend a protocol to standardize practice.

(Lewis & Pope, 2017)

Safety of Peripheral Intravenous Administration of Vasoactive Medication

Jose Cardenas-Garcia, MD[1]*, Karen F. Schaub, BS[1], Yuly G. Belchikov, PharmD[2], Mangala Narasimhan, DO[1], Seth J. Koenig, MD[1], Paul H. Mayo, MD[1]

Variables	
Location	Upper extremity only. No hand, wrist, or antecubital placement.
Duration	49 ± 22 hours
Medications	Norepinephrine 65%, dopamine 13%, phenylephrine 22%. Variety of drug concentrations.
Catheters	18g 25%, 20g 75%. Length 3cm, 4.5 cm, or 4.8 cm

- Clinical protocol for insertion and management.
- Extravasation rate 2% (n=19), prompt treatment with phentolamine, no patient experienced a skin injury.
- The delivery of vasopressors via PIV is safe and feasible. Vasopressors should no longer be considered an absolute indication for CVC.

(Cardenas-Garcia, 2015)

PROJECT

IV Requirements

A. Intravenous access requirements:
   a. A 20G or larger IV
   b. IV must be placed in the forearm contralateral to the blood pressure cuff. No hand, wrist, or antecubital IV's are allowed for continuous vasopressor infusion.
   c. Position of IV catheter confirmed by ultrasound
   d. Vein diameter > 4 mm on ultrasound.

B. Prior to administration of IV vasopressors:
   a. Patient must have two IV sites that meet the intravenous access requirements as outlined in Section A.
   b. Aspirate 3 mL of blood using a 10 mL syringe from the peripheral IV line. If unable to aspirate notify ordering provider/IV Resource.

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Medication Criteria

C. Drugs, Administration, and Dose Limits for Peripheral IV Infusion:
   a. Single and double strength drug concentrations only.
   b. A carrier of Normal Saline infusing at 50 mL/hr in conjunction with the vasopressor to provide dilution.
   c. Peripheral infusion of IV vasopressors is limited to a single vasopressor with an infusion duration of 24 hours.

Drug	Dose Limit
Norepinephrine	10 mcg/min
Dopamine	10 mcg/kg/min
Phenylephrine	100 mcg/min
Epinephrine	10 mcg/min
Vasopressin	0.04 units/min

Nursing Assessments

- Assess and document every 1 hour: Assess the peripheral IV site, catheter tip, and surrounding tissue, including the venous pathway for signs and symptoms of extravasation.
- Assess and document every 2 hours: Aspirate blood from the peripheral IV catheter where the vasopressor is infusing.

Key Takeaways

- Peripheral infusion of vasopressors can be a method to achieve hemodynamic stability.

Location	Proximal extremities are better, forearm placement is reasonable with triggers to advance to a central line. Avoid joints.
Duration	< 24 hours
Medications	All vasopressors carry a risk.
Catheter	20 ga, 18 ga preferred

- Know your organizations extravasation policy/protocol.

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Recommended Literature:

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