Peripheral Vasopressor Infusion Guideline - Adults

1. Guiding Principles

The use of vasopressor agents via a peripheral intravenous cannula has traditionally been avoided due to concerns around the potential for extravasation and ischemic limb injury.

Patients requiring vasopressor agents for hemodynamic support therefore have traditionally required central venous access.

The use of peripheral agents such as Noradrenaline, Dopamine or Adrenaline has been trialled and in recent times been found to be safe for short durations.[1,2,3]

There are risks in placing central lines in patients, especially in especially in remote areas with limited resources. Hence there is a need to assess the relative risks and benefits in critically unwell patients in order to avoid prolonged periods of hypotension and poor perfusion.

The goal of this guideline is to establish a safe practice for the use of peripheral vasopressor agents in WA Country Health Service sites.

2. Guideline

Vasopressor infusions are indicated in patients with distributive shock where there is an anticipated need for ongoing hemodynamic support. Primarily, this occurs in the context of septic shock. Other indications such as ongoing anaphylaxis, neurogenic shock or for the treatment of iatrogenic shock (e.g. due to sedative agents) should be considered and discussed with a senior doctor with appropriate credentials and experience in the use of vasoactive infusions i.e. FACEM via Emergency Telehealth Service (ETS), RFDS and/ or ICU Specialist.

There is some evidence to suggest that the earlier use of vasopressors in sepsis may improve outcomes.[4]

Vasopressor infusions are **NOT** appropriate as a primary therapeutic option in patients with hypovolemic or cardiogenic shock.

The use of peripheral vasopressors may be preferred in patients with a contraindication to central venous access (e.g. coagulopathy) or where central access is unachievable for technical reasons.

Some patients will have other indications for insertion of a central venous cannula (CVC) (e.g. difficult access, sampling, monitoring) – in these cases the risk of peripheral infusions may not be justified if a CVC is otherwise required.

There is an increase in the risk of extravasation after 12 hours[2]. Therefore the patient requires reassessment and a formal insertion of a CVC under aseptic technique as soon as practical and safely achievable by a suitably trained doctor. Incidents of extravasation must be reported via Datix Clinical Incident Management System (Datix CIMS).

The decision to commence a peripheral vasopressor infusion is made by the treating medical officer. This may be the local hospital physician, a FACEM via ETS, RFDS and/or ICU specialist.

Overall, the need for vasoactive agents should be considered a trigger to seek advice and assistance from a senior medical officer with appropriate credentials and experience in critical care i.e. FACEM via ETS and/or RFDS and/or ICU specialist to facilitate management and expedite urgent retrieval of the patient to a site with appropriate resources to insert a CVC safely and treat the primary ongoing medical problem.

NOTE: WA Country Health Service sites which have the capability to safely and timely insert a central venous line, the administration of vasopressors via the central route should remain the standard route of administration.

2.1 Drug Preparations [5]

The standardised concentrations of vasopressor medications are as per the Royal Flying Doctor Drug Infusion Guidelines [5]:

- Noradrenaline 4mg in 500 ml of 5% dextrose
- Dopamine 200 mg in 500 ml Normal Saline
- Adrenaline 3 mg in 500 ml of Normal Saline or 5% dextrose.

2.2 Selection of Appropriate Peripheral Intravenous Cannulae (PIVC)

There is some evidence to show that the cautious selection of a suitable PIVC site as well as the below preventative measures may reduce the risk of extravasation of vasoactive medications.

- **Upper extremity only**, contralateral to the blood pressure cuff
- Intravenous line location and size requirements:
  - Well sited large bore IV cannula (PIVC) of **at least 18 gauge** or larger
  - Ideally **brachial or cephalic vein at or above the elbow or**
  - **Alternatively** a large bore PIVC of at **least 18 gauge** in the antecubital fossa vein
- **No hand, wrist or forearm peripheral IV (PIV) access**
- Do not insert an IV cannula distal to a previous puncture site
- Ensure patency of the PIVC prior to administration by checking that:
  - aspiration of blood from the PIVC access is easily possible every 2 hours
  - no resistance is present when flushing with 10ml 0.9% Saline
  - intravenous infusion runs freely

- Assessment and documentation of PIVC access function and neurovascular observation **HOURLY** on the MR179 WACHS Peripheral Intravenous Cannula Observation Record and MR149 WACHS Neurovascular Observation Chart.
- Immediate alert by nursing staff to the medical team if line extravasation, with prompt initiation of extravasation management as outlined below
  - 12 hours maximum duration of PIVC access use.

It may be appropriate to continue to use peripheral vasopressors past 12 hours if the expected course of disease is likely to improve and the therapy is of low dose. This situation is assessed on an individual case-by case basis and **MUST BE DISCUSSED** with a specialist credentialed and experienced in critical care i.e. FACEM via ETS and/ or RFDS and/or ICU specialist.

Contact ETS / RFDS / tertiary referral hospital as soon as possible to discuss further and ongoing management until retrieval/ transfer of the patient

2.3 Extravasation Injuries from Peripheral Vasopressors

Extravasation should be suspected if the following occurs:

- Patient complains of burning, stinging, pain or discomfort
- Evidence of swelling, oedema, discoloration of surrounding skin (pale or erythema) or leakage at the site
- Absence or change of infusion flow
- Repeated pump alarms
- Increase in resistance when administering IV saline bolus.

If extravasation is suspected, the following steps must be followed:

STOP the infusion
If the patient is relying on the agent for their hemodynamics, switch the pressor to another IV (see above conditions for peripheral IV access) or place an immediate IO or central line.

LEAVE the cannula in place

ASPIRATE as much of the drug as possible from the cannula using a 3ml syringe

PLAN

- **CALL** for assistance (medical officer, ETS, RFDS)
- **ASSESS** the affected area for presence of symptoms e.g. skin discoloration, swelling
- **TRACE** the affected area with a marker pen
- **REMOVE** the IV cannula. Ensure hemostasis. Do NOT apply pressure
- **APPLY GTN PASTE** at a concentration of 0.2% (i.e. Rectogesic ®) to the affected area - approx. a 2.5 cm strip of paste and cover with Opsite

A GTN patch acts more slowly, DOES NOT offer any advantage and MUST NOT be used.

- **MONITOR and REVIEW** the affected area **HOURLY** for evidence of tissue ischemia – attending medical officer, nursing staff and/or surgical team
- **DOCUMENT** findings and neurovascular observations **HOURLY**
- **COMMUNICATE** adverse event and findings to retrieval team and medical officer at the receiving hospital. An incident notification must be lodged via the Datix Clinical Incident Management System (Datix CIMS).

3. Definitions

Vasopressor	A drug or other agent which causes the constriction of blood vessels
FACEM	Fellow of Australasian College for Emergency Medicine = Emergency Medicine Physician
ETS	Emergency Telehealth Service
RFDS	Royal Flying Doctor Service
ICU	Intensive Care Unit
CVC	central venous cannula
Extravasation	Accidental administration of intravenously infused medications into the extravascular space/tissue around infusion sites, either by leakage, previous venipuncture or direct leakage from a mispositioned venous cannula
PIVC	Peripheral intravenous cannula

4. Roles and Responsibilities

All Staff are required to work within their scope of practise and work according to policies and guidelines to make sure that WACHS is a safe, equitable and positive place to be.

5. Compliance

Failure to comply with this policy document may constitute a breach of the WA Health Code of Conduct (Code). The Code is part of the Employment Policy Framework issued pursuant to section 26 of the *Health Services Act 2016* (HSA) and is binding on all WACHS staff which for this purpose includes trainees, students, volunteers, researchers, contractors for service (including all visiting health professionals and agency staff) and persons delivering training or education within WACHS.

WACHS staff are reminded that compliance with all policies is mandatory.

6. Evaluation

Monitoring of compliance with this document is to be carried out via snapshot audit carried out by the Regional Medical Director (RMD) of the respective region and the Director of the Emergency Telehealth Service (ETS).

7. Standards

National Safety and Quality Healthcare Standards (First edition 2012) - 1, 3, 9
National Safety and Quality Healthcare Standards (Second edition 2017) - 1, 3, 8

Australian Health Practitioner Regulation Agency (AHPRA) Code of Ethics and Professional Code of Conduct for Nurses August 2008.

8. Legislation

The WA Country health Service (WACHS) provides safe medication administration in accordance with the national and state legislative requirements as per the:

- *Health Practitioner Regulation National Law (WA) Act* 2010
- *Poisons Act (WA)* 1964, Poisons Regulations (WA) 1965, and Poisons Amendment Regulations (No5) WA 2010
- *Therapeutic Goods Act* 1989
- *Occupational Safety and Health Act* 1984

9. References

1. Safety of peripheral intravenous administration of vasoactive medication. Cardenas-Garcia J[1], Schaub KF[1], Belchikov YG[2], Narasimhan M[1], Koenig SJ[1], Mayo PH[1].
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3. Central or peripheral catheters for initial venous access of ICU patients: a randomized controlled trial.
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4. Early versus delayed administration of norepinephrine in patients with septic shock
   Critical Care 2014, 18:532 Xiaowu Bai, Wenkui Yu*, Wu Ji,
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5. Royal Flying Doctor Service, Clinical Manual, Part 2: Drug Infusion Guidelines, Version 8.0, August 2018

10. Related Forms

MR179 WACHS Peripheral Intravenous Cannula Observation Record

MR 149 WACHS Neurovascular Observation Chart

11. Related Policy Documents

WACHS Vascular Access Device Management Clinical Practice Standard

WACHS Medication Administration Policy

12. Related WA Health System Policies

MP 0078/18 Medication Chart Policy

MP 0038/16 Insertion and Management of Peripheral Intravenous Cannulae in Western Australia Healthcare Facilities

13. Policy Framework

Public Health Policy Framework

This document can be made available in alternative formats on request for a person with a disability

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