Adrenaline (Epinephrine) Infusion PHC Remote Guideline

Target Audience	All Clinical Employees
Jurisdiction **Jurisdiction Exclusions**	Primary Health Care Remote CAHS; Primary Health Care Remote TEHS N/A
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Approval Authority	Chairs Clinical Governance Committee PHC CAHS; Primary Health Care Remote Safety and Quality Committee TEHS; NT Drugs and Therapeutics Committee
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Purpose

To provide a guideline for Remote Area clinical staff when administering Intravenous adrenaline (epinephrine) that has been ordered by an Emergency Department (ED) Consultant or Retrieval doctor, for a patient requiring Blood Pressure (BP) control prior to retrieval

Guideline

General

Peripheral adrenaline (epinephrine) infusions may be necessary in remote settings to maintain BP control in severe life threatening hypotensive situations while the patient is awaiting evacuation to higher-level care.

The risk of adverse events from the peripheral infusion of a vasopressor is balanced against the risk of ongoing hypotension and resulting harm from lengthy reduced organ perfusion.

They must be administered from a specialist doctor's order only (i.e. administration order – written **or verbal**) from an ED Consultant or Retrieval doctor, or relayed by a Rural Medical Practitioner (RMP).

Indication

Hypotension not responding to first line treatment.

Adverse Effects

Infrequent – necrosis at infusion site.

Common (>1%) – tachycardia, palpitations, hyperglycaemia, anxiety, headache, fear, restlessness, tremor, dizziness, dyspnoea, weakness, sweating, pallor.

Route of Administration

Adrenaline (epinephrine) can be administered via intravenous infusion through a peripheral line in an emergency situation under the direction of the ED Consultant or Retrieval doctor.

Peripheral Intravenous (IV) cannulation site should be cubital fossa. IV cannula size must be 18 gauge, 16 gauge or 14 gauge. Must discuss any other gauge with the treating doctor.

NOT recommended to be administered distal to cubital fossa.

Preparation and Administration of Infusion

1. Intravenous Cannula:

- Peripheral IV Cannula must be into a large vein. DO NOT cannulate distal to the cubital fossa.

Check patency of cannula before administration.

2. Infusion:

- Prepare: 1microg/mL solution of adrenaline (epinephrine) in Normal Saline (Sodium Chloride 0.9%) using:
    - adrenaline (epinephrine) 1mg/mL amp (1:1,000)
    - Sodium Chloride 0.9% 1000mL bag for infusion
- Add 1mg adrenaline (epinephrine) (1 x 1mg/mL amp) to 1000mL Sodium Chloride 0.9% bag and **mix bag well**.

Final solution = 1mg/1000mL (i.e. 1microg/mL).

- Clearly label bag using IV medication additive label.

IV therapy line **must**:

- Be dedicated darkened IV giving set containing no access ports
- Not be used for any other infusions or medications
- Be clearly identifiable as adrenaline (epinephrine) infusion line

3. Dosing

- Dose according to ED Consultant or Retrieval doctor

Dose range: **1-10microg/kg/hr**

(ED Consultant or Retrieval doctor to calculate dose as microg/kg/hr or microg/kg/min and relay to clinician in flow rate mL/hr required to infuse. A dose range of 1-10microg/kg/hr = 0.017-0.17microg/kg/**min**, i.e. roughly 0.02-0.2microg/kg/**min**)

For example, a 70kg person, using 1microg/mL solution (adrenaline in Sodium Chloride 0.9%)

	microg/kg/hr	mL/hr
70kg	1	70
	5	350
	10	700

Other examples:

Patient weight	Infusion rate range
60kg	60 – 600 mL/hr
80kg	80 – 800 mL/hr
100kg	100 – 1000 mL/hr
120kg	120 – 1200 mL/hr

ED Consultant or Retrieval Doctor will titrate dose according to response. Target BP will be patient specific dependent on usual BP or as directed by Consultant or Retrieval doctor. Generally aiming for systolic >100mmHg

Near completion of the first litre of peripheral vasopressors, i.e. adrenaline (epinephrine) 1microg/mL bag – call the ED Consultant or Retrieval doctor with a full set of vital signs. Discuss the need for continuing peripheral adrenaline (epinephrine).

If the patient remains hypotensive despite achieving maximal infusion rate (10mcg/kg/h), then the treating doctor may choose to increase the concentration of adrenaline (epinephrine) in subsequent infusions.

Monitoring and Documentation

1. Continuous non-invasive monitoring is required until retrieval.

- **Document <u>at least</u> 15-minute intervals.** *Set vital signs monitor to auto – record blood pressure and pulse every 15 minutes.*
  - Heart Rate
  - ECG rhythm
  - Blood pressure (do not use cannulated arm)

2. Infusion Site and Arm distal to infusion

Document neurovascular observations PRIOR to commencing infusion AND then at 30-minute intervals <u>at minimum</u>.

- Swelling of hand
- Colour
- Movement
- Sensation
- Warmth
- Pulse

ED Consultant or Retrieval Doctor must outline clear clinical parameters for patient observation aims. The treating clinician should have a clear understanding of when to inform or alert the prescribing doctor to any observations outside of those parameters.

Additional Information

Adrenaline can be given via the intraosseous route if IV access can't be obtained.

Gold standard is to do continuous invasive monitoring however documenting every 30 minutes is the minimum requirement to establish any clinical improvement or deterioration.

Adrenaline (Epinephrine) Infusion Flow Chart

Adrenaline IV peripheral infusions **MUST** be administered from a specialist doctor's order only (i.e. administration order – written **or verbal**) from an **ED Consultant or Retrieval doctor**, not an RMP.

IV Cannulation into Cubital Fossa

With 18g, 16g, 14g cannula

DO NOT CANNULATE

DISTAL TO CUBITAL FOSSA

USE OF SMALLER IV CANNULA MUST BE DISCUSSED WITH TREATING DOCTOR

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Check patency of cannula BEFORE administration

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Prepare solution

Adrenaline 1mg/mL amp (1:1000)

Sodium Chloride 0.9% 1000mL

Add Adrenaline to IV solution and

MIX WELL

Label Flask using IV additive label

*(*Please see 2. Infusion and 3. Dosing for guidance on preparing, dosing and administration rates)*

USE dedicated darkened IV giving set only.

IV giving set must not contain access ports

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- Continuous non-invasive monitoring is required until retrieval.
- Document observations every **15mins** at minimum:
  - Heart Rate
  - ECG Rhythm
  - BP – **do not use cannulated arm**

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- Document neurovascular observations on arm distal to infusion
  - **PRIOR** to commencing infusion, AND then
  - every **30mins** at minimum:
    - Swelling of hand
    - Colour
    - Movement
    - Sensation
    - Warmth
    - Pulse

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Set vital signs monitor on 15/60 auto and record. This will assist in documentation if you have no time to record at the time

Document Quality Assurance

	Method	Responsibility
Implementation	Document will be accessible via the Policy Guideline Centre and Remote Health Atlas.	Health Policy Guidelines Program
Review	Document is to be reviewed within three years, or as changes in practice occur.	Senior Pharmacist PHC CAHS
Evaluation	Evaluation will be ongoing and informal, based on feedback.	Senior Pharmacist PHC CAHS

Key Associated Documents

Key Legislation, By-Laws, Standards, Delegations, Aligned & Supporting Documents	N/A
References	Brewer, J.M., Puskarich, M.A., Jones, A.E. Can Vasopressors Safely Be Administered Through Peripheral Intravenous Catheters Compared With Central Venous Catheters? *Annals of Emergency Medicine* 2015 Vol 10 No 9 Cardenas-Garcia, J., Schaub, K.F., Belchikov, Y.G., Narasimhan, M. Koenig, S.J., Mayo, P.H. Safety of Peripheral Intravenous Administration of Vasoactive Medication. *Journal of Hospital Medicine* 2015 Loubani, O.M., Green, R.S., A systematic review of extravasation and local tissue injury from administration of vasopressors through peripheral intravenous catheters and central venous catheters. *Journal of Critical Care* 2015 Australian Medicines Handbook. (2017). Sympathomimetics. Accessed 5/07/2017 from: https://amhonline.amh.net.au/-Adrenaline(epinephrine)(anaphylaxis) Tsai, D. (2012). ASH Adrenaline Guideline. Accessed 10/08/2017 from: http://internal.health.nt.gov.au/PGC/DM/Documents/CAHS/Alice

Evidence Table

Reference	Method	Evidence level (I-V)	Summary of recommendation from this reference
N/A	N/A	N/A	N/A