Adrenaline (Epinephrine)

<table>
<tr><td colspan="2">CAUTION: High Administration Risk Rating</td></tr>
<tr><td>Form</td><td>1 in 10,000 (1mg per 10mL) prefilled syringe (Resuscitation trolley only)
1 in 1,000 (1mg per 1mL) ampoule</td></tr>
<tr><td>Reconstitution</td><td>1:10,000 Prefilled syringe: Already in solution
If the prefilled syringe is not available, the 1:1000 (1mg per 1mL) may be diluted to 1 in 10,000.
Dilute 1mL with 9mL Sodium Chloride 0.9% and mix well.

1:1000 Ampoule: Already in solution.
Draw up using a 5 micron filter needle
Use gloves when opening ampoules
Dilute further before IV administration.
Discoloured solutions or solutions containing precipitate should not be used.</td></tr>
<tr><td>Compatibility & Stability</td><td>Sodium Chloride 0.9%
Glucose 5%</td></tr>
<tr><td>Administration</td><td>IV injection (Resuscitation)
Use 1:10,000 (1mg per 10mL) prefilled syringe where available.
Give by rapid IV injection.
Administer via a central venous access device if already in place, or into a large peripheral vein.
IV injection administered via a peripheral vein should be followed by a 20mL flush of Sodium Chloride 0.9% to aid entry into the central circulation.

IM Injection (Anaphylaxis)
Use 1:1000 (1mg per mL) ampoule)
Administer into the middle third of anterolateral thigh.

Central IV infusion (Critical care only)
Use 1:1000 (1mg per mL) ampoules and administer through a central line, using a syringe driver to control the rate of infusion.
The usual range is 1-30 mcg/min, titrated to desired effect, but can go higher (up to 80mcg/min).
Single Strength Adrenaline
Add 3mg Adrenaline (3mL) to 47mL Glucose 5% to give 50mL of a solution containing 60mcg/mL Adrenaline.<table><tr><td>Infusion rate of 1mL/hr = 1microgram/min= 60microgram/hr</td></tr><tr><td>1mL/hr = 1microgram/min</td></tr><tr><td>2mL/hr = 2microgram/min</td></tr><tr><td>3mL/hr = 3microgram/min</td></tr></table>Double Strength Adrenaline
Add 6mg Adrenaline (6mL) to 44mL Glucose 5% to give 50mL of a solution containing 120mcg/mL Adrenaline.<table><tr><td>Infusion rate of 1mL/hr = 2microgram/min= 120microgram/hr</td></tr><tr><td>1mL/hr = 2microgram/min</td></tr><tr><td>2mL/hr = 4microgram/min</td></tr><tr><td>3mL/hr = 6microgram/min</td></tr></table></td></tr>
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Quadruple Strength Adrenaline (ITU only)

Add 12mg Adrenaline (12mL) to 38mL Glucose 5% to give 50mL of a solution containing 240mcg/mL Adrenaline.

Infusion rate of 1mL/hr = 4microgram/min= 240microgram/hr
1mL/hr = 4microgram/min
2mL/hr = 8microgram/min
3mL/hr = 12microgram/min

Peripheral IV infusion (where no Central access)

Use 1:1,000 (1mg/mL ampoule)
Add 4mg (4mL) to 246mL compatible fluid (conc. **16 microgram/mL**)
Administer via infusion pump
Starting dose 0.05microgram/kg/min
UP Titrate to desired effect - Maximum rate 0.13 microgram/kg/min (8 microgram/kg/h)

Rate (mL/hour) for microgram/kg/min doses using 4mg/250mL infusion*			
Dosage (microgram/kg/min)	**50kg**	**80kg**	**100kg**
0.05 microgram/kg/min	9	15	19
0.1 microgram/kg/min	19	30	38
Max 0.13 microgram/kg/min	25	40	50

*Doses rounded for convenience

Extravasation

If a **central venous access device** is not available, use a large peripheral vein and a concentration of adrenaline suitable for peripheral venous access. Monitor the insertion site closely (as may cause venous irritation) using a recognised phlebitis scoring tool. Re-site cannula at first signs of inflammation.
Risk with extravasation resulting in tissue damage/necrosis if given peripherally as adrenaline is a potent vasoconstrictor and has a low pH.

If extravasation occurs, use warm compress + Phentolamine.

Monitoring

Continuous blood pressure and ECG monitoring required. When administered via an infusion, use invasive blood pressure monitoring and monitor blood glucose.

Additional Information

- Repeated local administration may produce necrosis at the sites of injection.
- Intramuscular injections of Adrenaline into the buttocks should be avoided because of the risk of tissue necrosis.
- Reduce the rate of infusion gradually prior to discontinuation whilst closely monitoring blood pressure
- For hyperglycaemic patients, drug may be added to Sodium Chloride 0.9%
- Adrenaline infusion is usually prescribed as a "microgram/minute" dose for adults.
- See **PPG-CUH-NUR-21** - Medication Protocol for the Administration of Epinephrine (Adrenaline) Injection BP 1:1000 by IM injection nurses and midwives for the management of a patient with anaphylaxis.

Information provided relates to Adrenaline (MercuryPharma) and prefilled syringes (Aguettant).