Esmolol

INCORRECT RECONSTIUTION AND DILUTION OF ESMOLOL CAN RESULT IN DEATH OR PERMANENT DISABILITY

FORM

A 50 mL vial containing 2500 mg of esmolol hydrochloride as powder for reconstitution and dilution.

INDICATION

1) Antiarrhythmic
2) Hypertensive emergencies
3) Tetralogy of Fallot

DOSE RANGE

1) **Arrhythmias**
2) **Hypertensive emergencies**

AGE	DOSE	FREQUENCY	ROUTE
Neonate – 6months	500micrograms/kg	Loading dose over 1 minute	I.V.
	50micrograms/kg/minute* If response is inadequate after 5 minutes, repeat loading dose above and increase maintenance dose by 50microgram/kg /minute. This process can be repeated every 5 minutes to a maximum maintenance dose of 300micrograms/kg/minute (see dose guide table below)	Continuous Infusion	I.V.

* Reduce maintenance dose to 25microgram/kg/minute if low blood pressure or low heart rate occurs. If response then becomes inadequate, increase the rate back to 50micrograms/kg/minute, and continue to escalate treatment if necessary as outlined above and in the table below.

DOSE INCREMENTATION GUIDE:

Stage	Bolus dose **over 1 minute**		Maintenance infusion		
			Dose	Rate of infusion (mL/**kg**/hr)	
				LOW CONCENTRATION 10mg/ml (≤ 2kg)	HIGH CONCENTRATION 20mg/ml (>2kg)
Start	500microgram/kg	followed by	25microgram/kg/minute (if low BP or HR)	0.15	0.075
			50microgram/kg/minute	0.3	0.15
Step 2	500 microgram/kg		100microgram/kg/minute	0.6	0.3
Step 3	500 microgram/kg		150microgram/kg/minute	0.9	0.45
Step 4	500 microgram/kg		200microgram/kg/minute	1.2	0.6
Step 5	500 microgram/kg		250microgram/kg/minute	1.5	0.75
Step 6	500 microgram/kg		300microgram/kg/minute	1.8	0.9

When stopping treatment reduce dose gradually.

3) Tetralogy of Fallot

AGE	DOSE	FREQUENCY	ROUTE
Neonate – 6months	600micrograms/kg	Loading dose over 1 minute	I.V.
	300-900micrograms/kg/minute. adjust maintenance dose according to response.	Continuous Infusion	I.V.

PRESCRIPTION OF CONTINUOUS INFUSION

****SPECIAL CARE with PRESCRIBING****.
Flow rates are expressed as ml/**kg**/hour NOT ml/hr

For babies ≤ 2kg:
LOW Concentration = 500mg in 50ml (10mg/ml) solution for infusion

This gives; - 50micrograms/kg/minute at 0.3ml/**KG**/hr
100micrograms/kg/minute at 0.6ml/**KG**/hr

For babies > 2kg
HIGH Concentration = 1000mg in 50ml (20mg/ml) solution for infusion

This gives; - 50micrograms/kg/minute at 0.15ml/**KG**/hr
100micrograms/kg/minute at 0.3ml/**KG**/hr

RECONSTITUTION

Reconstitute with 50mL of glucose 5%

The powder will dissolve completely after reconstitution. Mix gently until a clear solution is obtained.

Reconstituted solutions should be visually examined for particulate matter and discoloration. Only a clear and colourless solution should be used

DILUTION

For LOW CONCENTRATION further dilute the reconstituted content of the vial to a concentration of 10mg/mL:

Esmolol 50mg/mL reconstituted solution	10ml
Glucose 5%	Up to 50ml

For HIGH CONCENTRATION further dilute the reconstituted content of the vial to a concentration of 20mg/mL:

Esmolol 50mg/mL reconstituted solution	20ml
Glucose 5%	Up to 50ml

METHOD OF ADMINISTRATION

NB. Esmolol is highly irritant and can cause extravasation injuries.
For 10mg/ml: administer via central access. If central access is unavailable, administer via a large vein.
For 20mg/ml: Must ONLY be administered via central access.

For continuous Infusion
Run by continuous intravenous infusion, flow rate adjusted according to the baby's response (see prescription section for details).

Bolus dose
500 micrograms/kg can be administered as a separate bolus over 1 minute

COMPATIBILITY

Solution compatibility	glucose 5%; sodium chloride 0.9%; sodium chloride 0.9% and glucose 5%; glucose 5% in sodium chloride 0.45%
Solution incompatibility	TPN, glucose 10%
IV Line compatibility	adrenaline, amiodarone, benzylpenicillin, dopamine, dobutamine, fluconazole, gentamicin, heparin, hydrocortisone, insulin, metronidazole, midazolam, morphine, noradrenaline, sodium bicarbonate, vancomycin, vecuronium
IV Line incompatibility	amphotericin, esomeprazole, furosemide, milrinone, omeprazole, thiopental sodium, TPN

THIS LIST IS NOT EXHAUSTIVE PLEASE CONTACT PHARMACY FOR FURTHER INFORMATION ON COMPATIBILITY WITH ANY MEDICINES NOT INCLUDED

CAUTIONS, CONTRA-INDICATIONS AND SIDE EFFECTS
See Summary of Product Characteristics and most recent edition of BNF for Children (links below)

FURTHER INFORMATION

Monitor BP, ECG and pulse continuously.

Hypotension is the most frequently observed side effect and is rapidly reversible with dosage reduction or discontinuation.

Monitor for infusion site reactions including: inflammation, oedema, erythema, and skin discolouration. If local infusion site reactions occur, use an alternative infusion site

Half life: 9 minutes

Do not flush the central venous access device. After the infusion is discontinued, disconnect the administration set, aspirate the cannula contents and then flush with sodium chloride 0.9% or glucose 5%.

If giving via a large peripheral vein, flush at the same speed as the rate of infusion to avoid adverse haemodynamic effects.

STORAGE

Do not store above 25°C. Do not refrigerate or freeze. Keep vials in their outer carton to protect from light.

The opened, reconstituted and diluted product should be used immediately. It is stable for 24 hours at 25°C.

PH

4.5 - 5.5
osmolarity approximately 300 mOsm/L at 10mg/mL.

LICENSED STATUS

Not licensed for use in children.

LINKS

BNF for Children / Electronic Medicines Compendium:

APPLICABLE POLICIES

West of Scotland Neonatal Guidelines:

Consult local policy if applicable

Document Number:	001	Supersedes:	Nil
Prepared by:	H Porter / A Patel	Checked by	WoS Neonatal Pharmacists
Date prepared	February 2021	Date updated	
Updated by		Review Date	February 2024

Administer reconstituted solutions immediately.
All vials, ampoules and infusion bags are for single use only unless otherwise stated.
Dose may vary depending on indication, age, renal function, hepatic function, and concomitant medications.
This monograph should be used in conjunction with the package insert, BNF for Children, and Summary of Product Characteristics. For further advice contact your clinical pharmacist or pharmacy department.