



MONOGRAPH

Esmolol

Scope (Staff):	Medical, Pharmacy, Nursing, Anaesthetic Technicians
Scope (Area):	Critical Care Areas, PCHN

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this [DISCLAIMER](#)

QUICKLINKS

Dosage/Dosage Adjustments	Administration	Compatibility	Monitoring
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DRUG CLASS

Ultra-short acting beta₁ adrenergic receptor blocker.¹

INDICATIONS AND RESTRICTIONS

Esmolol must only be administered in an emergency or critical care setting

- Atrial fibrillation/atrial flutter for short term, rapid control of ventricular rate.¹
- Non-compensatory sinus tachycardia.¹
- Hypertension in peri-operative period.¹

CONTRAINDICATIONS

- Hypersensitivity to esmolol or any component of the formulation.
- Patients with sinus bradycardia (without pacemaker), second or third degree heart block (without pacemaker), cardiogenic shock.¹

PRECAUTIONS

- Peripheral vascular disease, Raynaud's phenomenon – may exacerbate symptoms by reducing peripheral circulation.¹
- Diabetes – may mask signs of hypoglycaemia, monitor blood glucose.¹

- Asthma, obstructive airways disease – may worsen, use lowest effective dose¹
- Hypotension – may exacerbate, monitor blood pressure closely and consider using lower dose¹
- Heart failure – may worsen¹

FORMULATIONS

Listed below are products available at PCH, other formulations may be available, check with pharmacy if required:

- Esmolol 100 mg/10 mL vials

Imprest location: [Formulary One](#)

DOSAGE & DOSAGE ADJUSTMENTS

Intravenous loading dose:

- **4 weeks – 18 years:** 100 – 500 microg/kg over 1 minute, dose may be repeated if required.^{2, 3}

Loading dose may be prescribed at the consultant's discretion. Continuous infusion may be commenced without a loading dose.

Intravenous continuous infusion:

- **4 weeks – 18 years:** Initially 25 – 100 microg/kg/minute, titrate to response by increments of 25 – 50 microg/kg/minute with at least 5 minutes between dose adjustments, up to 500 – 1000 microg/kg/minute, usually for no longer than 48 hours.^{2, 3}

Renal impairment:

- No dosage adjustment necessary in renal impairment. However, the metabolite is excreted unchanged by the kidneys and may accumulate in renal impairment. Use with caution.^{4, 5}

Hepatic impairment:

- No dosage adjustment in hepatic impairment.^{3, 4}

ADMINISTRATION

- Administer 10 mg/mL undiluted.^{3, 6}
 - For continuous infusions, draw an appropriate amount of undiluted esmolol into a 50 mL syringe.
 - The syringe driver may not be able to administer high infusion rates if a 30 mL syringe is used.
- Infusion via a large peripheral vein or central line is preferred. Skin sloughing and necrosis have been reported following infiltration and extravasation of esmolol infusions.³
- When stopping treatment, taper infusion slowly to avoid rebound effects.²

COMPATIBILITY (LIST IS NOT EXHAUSTIVE)**Compatible fluids:**

Sodium chloride 0.9%, glucose 5%, sodium chloride 0.45%, glucose in sodium chloride solutions, Hartmann's, Plasma-Lyte 148 (at Y-site)⁶

Compatible at Y-site:⁶

Only commonly used drugs are listed below. This is not a complete list of incompatible drugs.

[Compatibilities of IV drugs](#) must be checked when two or more drugs are given concurrently.

Amikacin, aminophylline, amiodarone, calcium chloride, calcium gluconate, cefazolin, cefotaxime, ceftazidime, ceftriaxone, clindamycin, fentanyl, fluconazole, gentamicin, heparin sodium, labetalol, magnesium sulfate, meropenem, metronidazole, micafungin, midazolam, morphine sulfate, sodium acetate, sodium bicarbonate, tobramycin, trimethoprim-sulfamethoxazole, vancomycin

INCOMPATIBLE drugs:

Aciclovir, ciprofloxacin, dantrolene, dexamethasone, diazepam, furosemide, ganciclovir, ketorolac, milrinone, pantoprazole, phenobarbital^{3, 6}

MONITORING

Continuous ECG, blood pressure, heart rate, respiratory rate, infusion site, peripheral circulation, serum potassium.³⁻⁵

ADVERSE EFFECTS¹

Most common adverse effects resolve in about 30 minutes after dose reduction or stopping infusion.

Common:

Hypotension, chest pain, peripheral ischaemia, nausea, vomiting, constipation, dizziness, somnolence, fatigue, confusion, agitation, headache, sweating, inflammation of injection site.

Rare:

Bronchospasm, dyspnoea, skin necrosis at injection site, severe bradycardia, asystole, cardiac arrest, ventricular tachycardia, idioventricular rhythm, hypoxia, respiratory arrest, seizures.

STORAGE

Store below 25° C.⁵

INTERACTIONS



This medication may interact with other medications; consult PCH approved references (e.g. [Clinical Pharmacology](#)), a clinical pharmacist or PCH Medicines Information Service on extension 63546 for more information.

****Please note:** The information contained in this guideline is to assist with the preparation and administration of **esmolol**. Any variations to the doses recommended should be clarified with the prescriber prior to administration**

References

1. Rossi S, Pharmaceutical Society of Australia, Australasian Society of Clinical and Experimental Pharmacologists and Toxicologists, Royal Australian College of General Practitioners. Australian Medicines Handbook 2024. Available from: <https://amhonline-amh-net-au.pklibresources.health.wa.gov.au/chapters/cardiovascular-drugs/drugs-arrhythmias/antiarrhythmics/esmolol?menu=hints>.
2. Handbook AM. AMH Children's dosing companion 2024. Available from: <https://childrens-amh-net-au.pklibresources.health.wa.gov.au/monographs/esmolol?menu=hints>.
3. Clinical Pharmacology Tampa. FL: Gold Standard, Inc.; 2024. Available from: <https://www-clinicalkey-com.pklibresources.health.wa.gov.au/pharmacology/monograph/228?type=1&n=Esmolol>.
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5. MIMS Australia. MIMS online [full product information] St Leonards, N.S.W: CMP Medica Australia.; 2024. 1v. (various pagings)]. Available from: https://www-mimsonline-com-au.pklibresources.health.wa.gov.au/Search/FullPI.aspx?ModuleName=Product%20Info&searchKeyword=esmolol&PreviousPage=~/Search/QuickSearch.aspx&SearchType=&ID=27240001_2.
6. Society of Hospital Pharmacists of Australia. Australian injectable drugs handbook Collingwood, Vic.: The Society of Hospital Pharmacist of Australia; 2024. Sixth edition.: [1 online resource.]. Available from: <https://aidh-hcn-com-au.pklibresources.health.wa.gov.au/browse/e/esmolol>.

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Healthy kids, healthy communities

Compassion

Excellence

Collaboration

Accountability

Equity

Respect

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