



Specialised Medication – Intravenous Glyceryl Trinitrate for ADULTS in Critical Care Areas Guideline

1. Guiding Principles

Provides guidance for the prescription and administration of glyceryl trinitrate for ADULT patients via the intravenous route for use within **Critical Care Areas only**.

2. Guideline ¹

Organic nitrate; promotes relaxation of vascular smooth muscle, producing dose related dilation of both arterial and venous beds. Venous dilation predominates, promoting pooling of blood in the peripheries and decreasing venous return to the heart.

2.1 Presentation ^{2,3}

50mg in 10mL ampoule.

2.2 Indication ^{1,2,3,4}

- Recurrent pain in acute coronary syndromes.
- Treatment of hypertension and myocardial ischaemia associated with sympathomimetic or catecholamine drug use.
- Treatment of acute cardiogenic pulmonary oedema.
- Blood pressure reduction in hypertensive emergencies.
- Congestive heart failure associated with acute myocardial infarction.
- Blood pressure control in perioperative hypertension.
- Production of controlled hypotension during neurosurgical or orthopaedic surgical procedures.

Glyceryl trinitrate infusions can be used to manage hypertension in patients with an ischaemic stroke. This guideline is not suitable for this indication – **Seek specialist advice from the appropriate tertiary facility.**

2.3 Contraindications ^{2,3}

- Hypersensitivity to glyceryl trinitrate, organic nitrates or any component of the product.
- Hypotension or uncorrected hypovolaemia.
- Increased intracranial pressure.
- Severe anaemia and arterial hypoxaemia.
- Constrictive pericarditis and pericardial tamponade.
- Concomitant use with phosphodiesterase-5 inhibitors (see drug interactions).
- As a supplementary medication for obstructive cardiomyopathy, especially if it is associated with aortic or mitral stenosis.

2.4 Precautions ^{2,3,9}

Pregnancy – Safety is not established. Category B2. Consultation with KEMH should be considered for pregnant patients.

Right ventricular myocardial infarction – Vasodilation and resultant reduction in pre-load can lead to significant hypotension

2.5 Drug interactions ²

- Phosphodiesterase-5 inhibitors including sildenafil, vardenafil and tadalafil - risk of profound hypotension. Combination contraindicated.
- Heparin – concomitant administration may lead to a decreased anticoagulant effect followed by a rebound effect when the glyceryl trinitrate is discontinued. Careful monitoring of aPTT and heparin dose adjustment is recommended.
- Any medication that can reduce blood pressure will have an additive effect.

2.6 Dosage / administration ^{1,5,6,7}

2.6.1 Peripheral or Central Line use via an Infusion Pump

NOT FOR DIRECT INJECTION – MUST BE DILUTED BEFORE USE.

When given via an infusion pump, glyceryl trinitrate is to be added to glucose 5% GLASS bottles and infused with a low sorbing, polyethylene lined PVC giving set (if available) to reduce loss due to adsorption to PVC giving sets (up to 80% loss)

- 1) Withdraw and discard 10mL from a 100mL glucose 5% **glass** bottle.
- 2) Add 50mg of glyceryl trinitrate to the remaining 90mL glucose 5%.
- 3) Invert the bottle several times to ensure uniform dilution of glyceryl trinitrate.
- 4) Infuse via rate controlled infusion pump at an initial rate of 25-50 microgram/**minute** (= 3-6mL/ hour).
- 5) Increase by 2mL/ hour every 5-10 minutes according to response.
- 6) Dose should be titrated against patient's tolerance and therapeutic response (total pain relief, symptom reduction or resolution) rather than to a precise dose. Reduce the infusion rate by 3mL/hour if the systolic blood pressure falls below 95mmHg.

If BP continues to fall after decreasing the rate, further down titration or cessation may be necessary (see monitoring requirements).

- 7) Wean the infusion as prescribed by the medical officer. Infusions that have been running for more than 24 hours should not be abruptly ceased.

Dosage table for Glyceryl Trinitrate 50mg in 100mL Glucose 5%						
Micrograms/ minute	25	50	75	100	150	200
mL/ hour	3	6	9	12	18	24

2.6.2 Central Line use via Syringe Driver

NOT FOR DIRECT INJECTION – MUST BE DILUTED BEFORE USE

When given via a syringe driver, glyceryl trinitrate should be infused with a low sorbing, polyethylene lined PVC giving set (if available) to reduce loss due to adsorption to PVC giving sets (up to 80% loss)

- 1) Draw up 50mg of glyceryl trinitrate from the ampoule, then dilute to 50mL with glucose 5% or sodium chloride 0.9%.
- 2) Invert the syringe several times to ensure uniform dilution of glyceryl trinitrate
- 3) Infuse via a rate controlled syringe driver at an initial rate of 25-50microgram/ **minute** (=1.5-3mL/ hour)
- 4) Increase by 1mL/hour every 5-10 minutes according to response
- 5) Dose should be titrated against patient’s tolerance and therapeutic response (total pain relief, symptom reduction or resolution) rather than to a precise dose. Reduce the infusion rate by 1.5mL/hour if the systolic blood pressure falls below 95mmHg.

If BP continues to fall after decreasing the rate, further down titration or cessation may be necessary (see monitoring requirements).

- 6) Wean the infusion as prescribed by the medical officer. Infusions that have been running for more than 24 hours should not be abruptly ceased.

Dosage table for Glyceryl Trinitrate 50mg in 50mL Glucose 5% or Sodium Chloride 0.9%						
Micrograms/ minute	25	50	75	100	150	200
mL/ hour	1.5	3	4.5	6	9	12

2.7 Expiry ^{6,7}

Prepared infusion: 24 hours below 25 degrees C in glass

2.8 Common adverse effects ^{2,3}

Hypotension, headache, reflex tachycardia, nausea, vomiting, dizziness

2.9 Monitoring requirements ^{1,5,8}

Baseline

- Pulse, BP, respiratory rate, peripheral oxygen saturations.
- Central venous pressure if clinically indicated.
- Pulmonary systemic pressure and pulmonary artery wedge pressure (PAWP) if pulmonary artery catheter is in situ.

Inform the Medical Officer prior to commencing the infusion if:

- 1) MAP < 65mmHg, systolic BP < 100mmHg and/or 20mmHg or more below patient's baseline (or as per modifications to Adult Observation and Response Chart (AORC))
- 2) heart rate < 50bpm or >120bpm (or as per modifications to AORC)
- 3) impaired conscious state
- 4) patient feeling dizzy/ faint.

Observations during commencement of Glyceryl Trinitrate Infusion

- Every 5 minutes until titrated to final rate
- Then every 15 minutes for 1 hour and when required as determined by titration parameters
- Then 2 hourly unless patients clinical condition indicates more frequent observations.

This regimen should be followed for any alteration in the rate of administration of the infusion.

Inform the medical officer if:

- 1) heart rate is <50 bpm, >120 bpm, or +/- 30 bpm of the pre-infusion pulse rate (or as per modifications to AORC)
- 2) MAP < 65mmHg, systolic BP < 100mmHg and/or 20mmHg or more below patient's baseline (or as per modifications to AORC)
- 3) the patient's symptoms remain unresolved.

3. Definitions

Critical Care Areas	Include Emergency Departments, Intensive Care Units, High Dependency Units and Theatre Departments where monitoring capabilities meet those specified in 2.9
MAP	Mean Arterial Pressure
BP	Blood pressure
BPM	Beats per minute

4. Roles and Responsibilities

The **Medical Officer** is to complete all treatment and duties within scope of practice.

The **Registered Nurse** is to complete all nursing duties for the patient within scope of practice including escalation of care as per the Adult Observation and Response chart (AORC).

5. Evaluation

Adverse events and clinical incidents relating to the administration of intravenous glyceryl trinitrate supplementation are to be zero (0).

6. Standards

National Safety and Quality Health Care Standards: 1.7.1, 4.1.2, 4.4.2, 4.9.1

7. References

1. Specialised Drug Guideline: Glyceryl Trinitrate. Fremantle Hospital. Last reviewed June 2011
2. DBL Glyceryl Trinitrate Concentrated Injection Product Information (eMIMs) Accessed: October 2016
3. [Australian Medicines Handbook](#) 2016
4. Electronic Therapeutic Guidelines: Glyceryl Trinitrate – Indications for use. 2012
5. Royal Flying Doctors Service Drug Infusion Guidelines: Glyceryl Trinitrate Infusion Last review January 2016
6. Australian Injectable Drugs Handbook 6th Edition. Society of Hospital Pharmacists Australia. April 2014
7. Handbook on Injectable Drugs 15th Edition. LA Trissel. 2009
8. Nursing Practice Standard for Glyceryl Trinitrate IV Infusion Management. Fiona Stanley Hospital. Revision date: 01/2018
9. Up-To-Date: Right Ventricular Myocardial Infarction. Literature current Nov 2016. Accessed: December 2016

8. WA Health Policy Framework

Clinical Governance, Safety and Quality Policy Framework

**This document can be made available in alternative formats
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