



Drug Therapy Protocols: Glyceryl trinitrate

Policy code	DTP_GTN_0722
Date	July, 2022
Purpose	To ensure a consistent procedural approach to glyceryl trinitrate administration.
Scope	Applies to all Queensland Ambulance Service (QAS) clinical staff.
Health care setting	Pre-hospital assessment and treatment.
Population	Applies to all ages unless specifically mentioned.
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Glyceryl trinitrate

July, 2022

Drug class

Vasodilator^[1,2]

Pharmacology

Glyceryl trinitrate (GTN) is a potent vasodilator that decreases preload by increasing venous capacity, pooling venous blood in the peripheral veins, reducing ventricular filling pressure and decreasing arterial blood pressure (after load). Because of this cascade it also causes vasodilation in coronary arteries that are in spasm and may assist the redistribution of blood flow along the collateral channels in the heart.^[1-3]

Metabolism

GTN is readily absorbed and metabolised by the liver.^[1]

Indications^[1-7]

- **Suspected ACS** (with pain)
- **Acute cardiogenic pulmonary oedema**
- **Autonomic dysreflexia**
(with a systolic BP \geq 160 mmHg)
- **Irukandji syndrome**
(with a systolic BP \geq 160 mmHg)

Contraindications

- Allergy AND/OR Adverse Drug Reaction
- Heart rate $<$ 50 OR $>$ 150 beats per minute
- Systolic BP $<$ 100 mmHg
- Acute CVA
- Head trauma
- Phosphodiesterase 5 inhibitor medication administration:^[4]
 - Sildenafil OR vardenafil in the previous 24 hours
 - Tadalafil in the previous 48 hours

Precautions

- Inferior AMI
- Cerebral vascular disease
- Risk of hypotension and/or syncope
- Intoxication (GTN effects are enhanced)
- Phosphodiesterase 5 inhibitor medication administration (e.g. tadalafil, sildenafil, vardenafil) administration in the previous 4 days.^[1,2,7]

Side effects^[1,2]



- Dizziness
- Hypotension
- Syncope
- Reflex tachycardia
- Vascular headaches

Presentation

- Spray (sublingual), 400 microg/dose, 200 doses, *nitrolingual pump spray*
- Ampoule, 50 mg/10 mL *glyceryl trinitrate*

Onset

< 2 minutes

Duration

20–30 minutes

Half-life

5.5 minutes

Schedule

- SUBLING spray – S3 (Therapeutic poisons).
- Ampoule, 50 mg/10 mL – S4 (Restricted drugs).

Routes of administration

Sublingual (SUBLING)



Intravenous infusion (IV INF)



Special notes^[1-4]

- Ambulance officers must only administer medications for the listed indications and dosing range. Any consideration for treatment outside the listed scope of practice requires mandatory approval via the *QAS Clinical Consultation and Advice Line*.
- Sublingual GTN is the first line treatment for ACS, however IV GTN should be considered as part of the management regime for all patients unresponsive to sublingual GTN, narcotics and/or β blockers.
- Research has identified that GTN potency may be reduced due to the migration of GTN into certain administration sets. IV INF doses should be titrated according to patient response despite the container and giving set used.
- Prepared GTN IV infusion solutions are stable in polypropylene syringes for 24 hours.
- Some patients with normal or low left ventricular filling pressures or pulmonary capillary pressure may be hypersensitive to the effects of GTN and may respond to IV infusion doses from 5 microg/min.
- CCP ESoP aeromedical officers must display extreme caution when ceasing GTN infusions due to the potential of rebound symptoms.
- GTN is the first line treatment for autonomic dysreflexia, however morphine should be considered as part of the management regime, if the patient is unresponsive to initial treatment.
- 50 mg/10 mL GTN ampoules are not currently supplied by the QAS – for procurement information please refer to the *QAS Drug Management Code of Practice*.
- All cannulae and IV lines must be flushed thoroughly with sodium chloride 0.9% following each medication administration.

Adult dosages ^[1-7]

Suspected ACS (with pain)		
AT P ACP1 ACP2 CCP	SUBLING	<p>400 microg Repeated at 5 minute intervals. No maximum dose.</p>
E CCP	IV INF	<p>CCP ESoP aeromedical – RSQ Clinical Coordinator consultation and approval required in all situations. Commence infusion at 5 microg/minute (3 mL/hour) and increase rate by 5 microg/minute (3 mL/hour) every 3–5 minutes until desired clinical response.</p> <p><i>Syringe preparation: Mix 5 mg (1 mL) of GTN with 49 mL of glucose 5% in a 50 mL syringe to achieve a final concentration of 100 microg/mL. Ensure all syringes are appropriately labelled. Administer via syringe driver.</i></p> <p>If at anytime the patient becomes unresponsive or hypotensive, cease infusion immediately.</p>
Acute cardiogenic pulmonary oedema		
AT P ACP1 ACP2 CCP	SUBLING	<p>400 microg Repeated at 5 minute intervals. No maximum dose.</p>

Adult dosages (cont.)

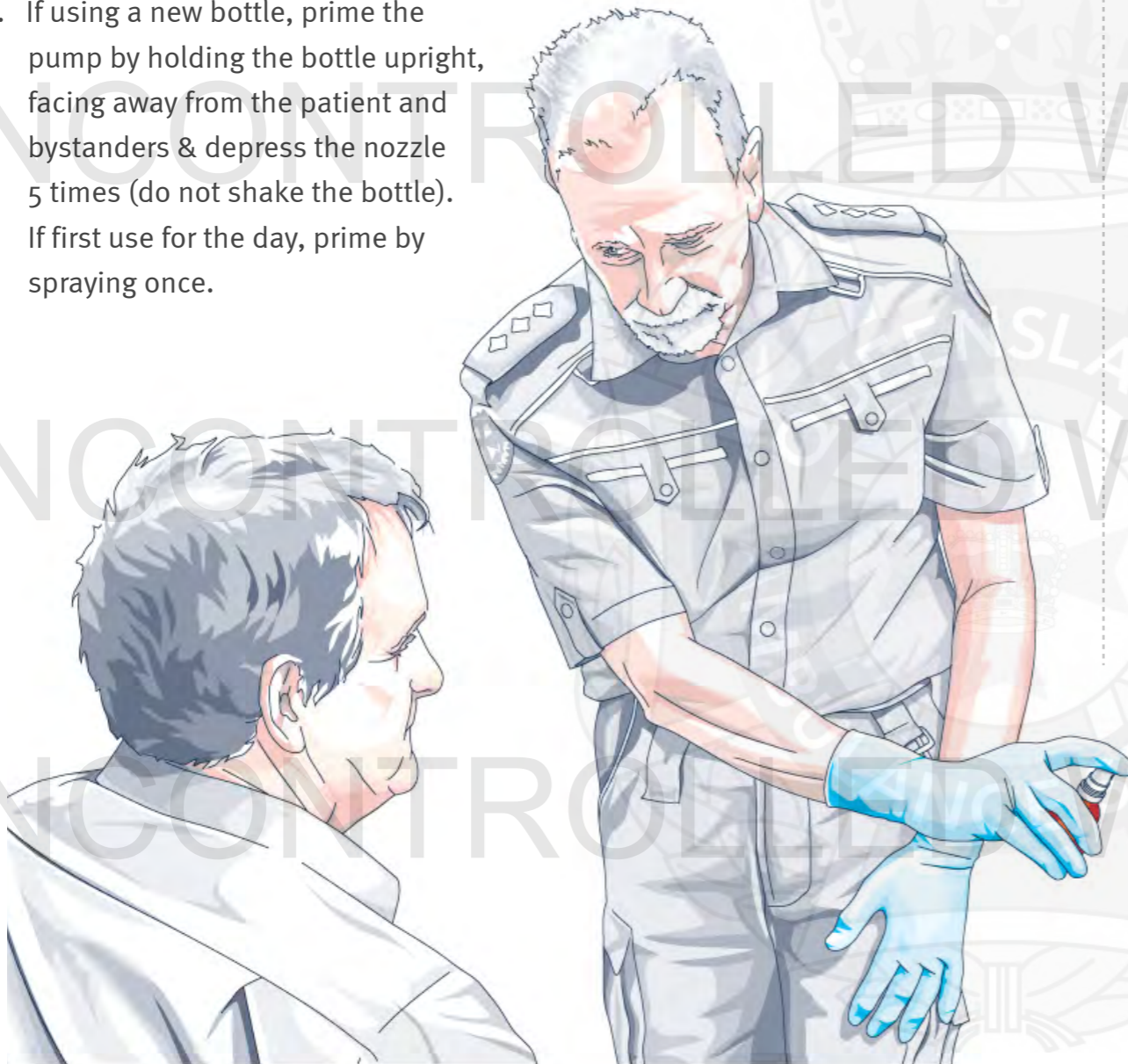
<ul style="list-style-type: none"> • Autonomic dysreflexia (with a systolic BP \geq 160 mmHg) • Irukandji syndrome (with a systolic BP \geq 160 mmHg) 		
ACP1 ACP2 CCP	SUBLING	<p>400 microg Repeated at 5 minute intervals. No maximum dose.</p>

Paediatric dosages ^[1-7]

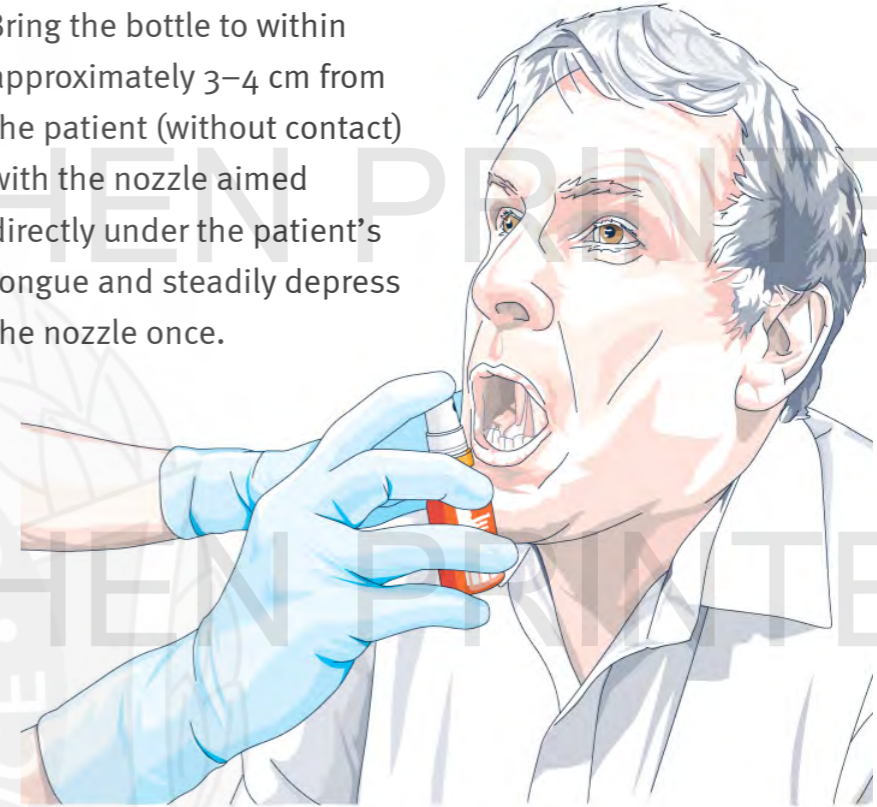
<ul style="list-style-type: none"> • Autonomic dysreflexia (with a systolic BP \geq 160 mmHg) • Irukandji syndrome (with a systolic BP \geq 160 mmHg) 		
ACP2 CCP	SUBLING	<p>QAS Clinical Consultation and Advice Line approval required in all situations.</p>
<p>Note: In all other instances, QAS officers are NOT authorised to administer GTN to paediatric patients.</p>		

Glyceryl trinitrate instructions for use

1. Position the patient in a sitting or semi-reclined position.
2. Remove the plastic cover from the GTN spray bottle, thoroughly wipe the entire container including the nozzle using an alcohol swab and allow to dry.
3. If using a new bottle, prime the pump by holding the bottle upright, facing away from the patient and bystanders & depress the nozzle 5 times (do not shake the bottle). If first use for the day, prime by spraying once.



4. Instruct the patient to open their mouth wide and lift their tongue to the roof of their mouth (some patients may have difficulty and may require a demonstration from the clinician).
5. Bring the bottle to within approximately 3–4 cm from the patient (without contact) with the nozzle aimed directly under the patient's tongue and steadily depress the nozzle once.



6. Recap the bottle after each administration.
7. If the nozzle inadvertently comes into direct contact with the patient, the bottle must be discarded after the last administration on the current patient.
8. After the last administration, thoroughly wipe the entire bottle including the nozzle and inside of the cap using an alcohol swab.
9. Recap the bottle and store in the drug kit for the next patient.