

Glyceryl Trinitrate (GTN) Intravenous Infusion for Cardiology

Use 50mg in 50ml vial and give undiluted (1mg/ml) via a syringe driver
Systolic blood pressure should be greater than 90 mmHg prior to starting GTN

Contraindications

- Acute circulatory failure (shock, collapse)
- Cardiogenic shock (unless a sufficient end-diastolic pressure is maintained by appropriate measures)
- Severe anaemia,
- Severe cerebral haemorrhage
- Head trauma
- Uncorrected hypovolaemia and hypotensive shock
- Arterial hypoxaemia and angina caused by hypertrophic obstructive cardiomyopathy
- Constrictive pericarditis
- Pericardial tamponade
- Toxic pulmonary oedema.
- During nitrate therapy, phosphodiesterase inhibitors type 5 (PDE5) (e.g. sildenafil, vardenafil, tadalafil) must not be used because PDE5 inhibitors may amplify the vasodilatory effects of Glyceryl Trinitrate resulting in severe hypotension
- Conditions associated with an increased intracranial pressure.
- Myocardial insufficiency due to obstruction, aortic or mitral stenosis, hypertrophic obstructive cardiomyopathy or constrictive pericarditis.

Refractory Unstable Angina

Start the infusion at a rate of 10 micrograms/minute and titrate the dose by 10 micrograms/minute increments at 30 minute intervals until chest pain is relieved or side effects prevent further titration.

AVOID HYPOTENSION. Take blood pressure (BP) before each dose increase and ensure systolic blood pressure remains above 90 mmHg at all times. Dose reduction or discontinuation of the infusion may be required if hypotension occurs. Once desired effect is achieved and BP is stable as a minimum re-check BP every hour and adjust infusion rate accordingly.

Severe Left Ventricular Failure

Start the infusion at a rate of 20 -25 micrograms/minute and titrate upwards by 20-25 microgram/minute increments at 15-30 minute intervals until the desired effect is obtained. Maximum dose of 200 micrograms/minute or the maximum tolerated dose. maximum tolerated dose for 5-30 minutes depending on blood pressure and response to treatment (take BP every 10 minutes during this time) then if on high dose decrease dose by 50 micrograms/minute.

AVOID HYPOTENSION. Take blood pressure before each dose increase and ensure systolic blood pressure remains above 90 mmHg at all times. Dose reduction or discontinuation of the infusion may be required if hypotension occurs. Once the patient is on a stable maintenance dose check BP every 30-60 minutes.

Infusion to be prescribed on Intravenous Infusion Prescription Sheet of the inpatient drug chart.

Glyceryl trinitrate is incompatible with polyvinylchloride (PVC); use a polyethylene syringe/infusion bag and polyethylene coated administration set

Dosing table for GTN 1mg / ml infusion

DOSE micrograms/minute	INFUSION RATE ml/hour
5	0.3
10	0.6
15	0.9
20	1.2
25	1.5
30	1.8
40	2.4
50	3.0
60	3.6
75	4.5
100	6.0
150	9.0
200	12.0

Example calculation for infusion rate: 50 micrograms/minute using 1mg/ml solution:

$$\frac{50(\text{micrograms/minute}) \times 60 (\text{no. of minutes in an hour})}{1000 (\text{no. of micrograms in 1ml})} = 3.0 \text{ ml/hour}$$

Common side effects:

Headaches
Dizziness
Tachycardia
Orthostatic
Hypotension
Somnolence

Symptoms of overdose could include the following:

Fall in blood pressure \leq 90 mmHg.
Pallor, weak pulse, syncope, collapse, dizziness.
Sweating, reflex tachycardia.
Headache
Nausea, Vomiting, Diarrhoea

Treatment of overdose:

Stop delivery of the drug.
Supply oxygen
Expand plasma volume

References

BNF: <https://bnf.nice.org.uk/>

SPC For full prescribing details: www.medicines.org.uk : Glyceryl trinitrate solution 1mg/ml infusion
Medusa Injection medicines guide via intranet

ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: The Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology 2016

Available at: <https://academic.oup.com/eurheartj/article/37/27/2129/1748921>. Accessed 2/9/21