

PROTOCOL FOR: Nitroglycerin: IV Administration

**POLICY:** This drug is to be administered only in critical care areas where the patient is on a cardiac monitor, and must be administered on an infusion pump, using drug guardrails.

**INDICATION:** Chest pain, angina, acute MI, preload reduction in CHF associated w/MI, HTN, pulmonary HTN

**DESIRED**

**PATIENT OUTCOMES:**

1. Patient will achieve effective pain relief and pre-load reduction (i.e. decrease in SOB, pulmonary congestion, PAOP).
2. Patient will not suffer negative side effects of nitroglycerin; VS will remain stable.

**CLINICAL  
ASSESSMENT AND**

**CARE:**

1. Prior to Starting Infusion:

- a. Solution is available in 2 premixed concentrations, prepared in a glass bottle:  
**Single concentration: 50 mg/250 ml D<sub>5</sub>W = 200 mcg/ml**  
**Double concentration: 100 mg/250 ml D<sub>5</sub>W = 400 mcg/ml**
- b. Perform baseline assessment:
  - 1) LOC/anxiety level
  - 2) V/S (BP, apical HR, resp. rate)
  - 3) Skin/color condition
  - 4) Heart & lung sounds
  - 5) Chest pain (location, severity, character)
  - 6) Hemodynamic parameters (i.e. PAOP)
  - 7) Validate O<sub>2</sub> administration per MD/LIP order.
- c. Do not begin drip if patient hypotensive < 90 systolic or if PAOP < 12; discuss with physician/LIP.
- d. Refer to dosage in **mcg/minute**.
- e. If patient is experiencing pain or discomfort, control environment for relaxation (moderate light, quiet, limit visitors).
- f. Place patient in semi-fowler's (30 degrees) or position of comfort; try to avoid bed higher than 30 degrees due to possible hypotension.
- g. Discuss with physician/LIP the concomitant use of small doses of intermittent IV narcotics to decrease patient's anxiety and promote rest.

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2. Beginning the Infusion & Initial Titration:

- a. Begin infusion at **10-20 mcg/minute**, per MD/LIP order.
- b. Increase by **10-20 mcg/minute** every **5 minutes** until desired hemodynamic effect or clinical response is obtained (absence or decrease in pain or pulmonary symptoms, decrease in PAOP). Recommended > 50 mcg/min for coronary vasodilation, if patient tolerates.
- c. Stay at bedside with patient during initial titration, assessing and documenting in clinical record / unit flow sheet:
  - 1) LOC/anxiety level
  - 2) V/S (obtain BP before/after any change in infusion rate)
  - 3) Chest pain or discomfort
  - 4) Other associated effects: Headache, dizziness, flushing
  - 5) Rhythm changes: esp. reflex tachycardia, PVC's, HR < 50, or AV dissociation

3. Care During Infusion:

- a. Reassess parameters above **every 5-10 minutes** until positive response obtained
- b. Once VS, pain, pulmonary status are stable, advance assessment intervals as appropriate (i.e. **q. 30 min x 2, then q. 1-2 hours**). If symptoms require additional dose adjustment, frequency of VS is again adjusted.

4. Maximum dose:

- a. While there is no set optimum dose, as patient response is variable, physician/LIP notification is warranted if desired effect & symptom relief is not obtained at a dose of **200 mcg/min.**

5. Potential Complications:

- a. Use assessment intervals to validate presence/absence of complications:
  - 1) Hypotension (systolic < 90 or > 30 mm drop in systolic)
    - a) Place patient flat, or knee gatch elevated if unable to tolerate lying flat- avoid trendelenburg.
    - b) Decrease infusion rate to previous dose
    - c) Stay with patient and continue decreasing rate to progressive levels until BP stabilizes.
    - d) If hypotension is severe, stop infusion and notify physician/LIP.

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2) Headache

- a) Give Tylenol PO (unless NPO/nausea present), per MD/LIP order.
- b) Titrate nitroglycerin dose down if headache is severe and patient remains pain-free.
- c) Reduce stimuli.
- d) If intolerable, notify physician/LIP, as the drip may need to be discontinued.

3) Bradycardia

- a) If HR drops but remains > 50 without symptoms, observe only.
- b) If sudden drop in heart rate, or rate < 50 creates hypotension, dizziness, or AV dissociation, place the patient flat (avoid trendelenberg), administer 0.5 mg atropine IV, and notify physician. Titrate NTG down slowly.

6. Discontinuation of Infusion:

- a. Begin downward titration for discontinuation with physician/LIP order only. Assess patient for recurrent pain or symptoms as drip is weaned. If patient remains asymptomatic, titration to off can proceed at same rate as upward titration (10-20 mcg every 5 minutes).

**APPROVAL:** ICU Standards Committee  
Nursing Standards Committee  
Emergency Department Unit Review  
Cardiac Step-Down Standards Committee

**EFFECTIVE DATE:** 2/88

**REVISION DATES:** 2/90, 9/90, 1/92, 1/93, 1/95, 8/99, 8/02, 10/03, 9/08, 5/09