Guidelines for Use of Intravenous Nitroglycerin

Major Indications

- Treatment of (unstable) angina pectoris, variant angina
- Treatment of congestive heart failure
- Reduction of blood pressure, especially during hypertensive crisis
- Production of controlled hypotension during surgical procedures to reduce bleeding
- Treatment of acute myocardial infarction may limit infarction size. Start within hours of onset of chest pain for best results

Mechanism of Action

Nitroglycerin is a vasodilator that primarily causes a reduction in preload and, to a lesser extent, afterload leading to hypotension. Nitroglycerin's onset of action is rapid (2-5 minutes) therefore, effects of the drug are seen within minutes of starting an infusion, and within minutes after making a dosage adjustment. Duration of hypotensive effect is 5-10 minutes.

Monitoring

- Continuous Blood Pressure- maintain diastolic blood pressure >80 mmHg
- Continuous EKG

Contraindications

- Hypotension due to shock or hypovolemia
- Increased intracranial pressure
- Constrictive pericarditis
- Pericardial tamponade

Dosing and Administration

*Initial Dose:* 10 mcg/minute. Dose should be increased by 10-20 mcg/min every 3-5 minutes until desired effects are obtained. Titration to desired effect may require rates to 100 mcg/min or more.

**If profound hypotension occurs, slowing of the infusion rate should correct the blood pressure due to nitroglycerin's short half life (1-4 min.). If the nitroglycerin drip is held secondary to hypotension, restart the infusion at ½ the previous infusion rate. Note: the hemodynamic effects of nitroglycerin may persist for 30-60 mins after stopping the infusion.

Discontinuation: To wean nitroglycerin, decrease drip by 5-10 mcg for 15 min. Monitor closely for return of chest pain or hypertension. Start other cardiac medications one hour prior to weaning.
**Adverse Reactions**

1. Hypotension
2. Headache, dizziness
3. Tachycardia, palpitations
4. Nausea, vomiting, abdominal pain
5. Apprehension, restlessness, muscle twitching
6. Methemoglobinemia

**Comments**

1. Nitroglycerin comes pre-mixed as standard or double strength, and quadruple strength can be prepared. Please be specific when calling the pharmacy. Be sure to indicate which strength you want.
2. Nitroglycerin is only prepared in glass containers, therefore, vented tubing or vented spike must be used.
3. In some patients, Nitroglycerin infusions have been used in combination with IV vasopressin. This combination may prevent severe hypertension thus allowing a higher dose of vasopressin to be used to reduce hemorrhaging.
4. Nitroglycerin may decrease the effect of heparin. Watch APTT if Nitroglycerin is started or stopped.
5. Small doses of IV Morphine may be given with Nitroglycerin.
To Use Chart:

1. Find applicable mixture/concentration in the far left columns.
2. Find desired dose in mcg/min along the top row.
3. Look across and down to the intersecting square containing an infusion rate in ml/hr.

Example: For a dose of 40 mcg/min using a double strength concentration, the rate would be 6 ml/hr.

| Dose in mcg/min | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 |
|-----------------|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Rate in ml/hr   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Standard Strength (200 mcg/ml) | 1.5 | 3 | 4.5 | 6 | 7.5 | 9 | 10.5 | 12 | 13.5 | 15 | 16.5 | 18 | 20 | 21 | 23 | 24 | 26 | 27 | 29 | 30 | 33 | 36 | 39 | 42 | 45 | 48 | 51 | 54 | 57 | 60 |
| Double Strength (400 mcg/ml) | 1.5 | 3 | 4.5 | 6 | 7.5 | 9 | 11 | 12 | 14 | 15 | 17 | 18 | 20 | 21 | 23 | 24 | 26 | 27 | 29 | 30 |   |   |   |   |   |   |   |   |   |
| Quadruple Strength* (800 mcg/ml) | 1.5 | 3 | 4.5 | 6 | 7.5 | 9 | 11 | 12 | 14 | 15 | 17 | 18 | 20 | 21 | 23 | 24 | 26 | 27 | 29 | 30 |   |   |   |   |   |   |   |   |   |

* May be prepared by aseptically adding 24 ml of nitroglycerin 5 mg/ml to a 250 ml premixed 400 mcg/ml bag to yield 800 mcg/ml final concentration.