Nitroglycerin Drip Supplement to Chest Pain / Acute Coronary Syndrome

☐ Medical Control Authorities choosing to adopt this supplement may do so by selecting this check box. Adopting this supplement changes or clarifies the referenced protocol or procedure in some way. This supplement supersedes, clarifies, or has authority over the referenced protocol.

Post-Medical Control

This protocol provides for the use of a Nitroglycerin Drip in the pre-hospital setting for systems that can justify the use based on long transport times. Implementation of the protocol requires additional paramedic training approved by the Medical Control Authority and Department. A suggested training outline is included in this protocol.

Indications for Nitroglycerin Drip

1. Chest pain secondary to presumed cardiac ischemia, acute coronary syndrome or acute myocardial infarction. The nitroglycerin drip may be used after failure of SL nitroglycerin and narcotic administration to relieve cardiac chest pain treated using the **Chest Pain / Acute Coronary Syndrome** protocol.
2. Acute pulmonary edema / CHF. The nitroglycerin drip may be used as a supplement to SL nitroglycerin treatment using the **Acute Pulmonary Edema / CHF** protocol.
3. Continued as a maintenance drip for patients during inter-facility transfers.

Equipment

1. At least one functioning IV. A second IV preferable to allow additional IV fluid or medication administration.
2. Pump and tubing supplied by the ambulance service. The pump may also be supplied by the hospital provided the paramedics have been previously trained in the use of the hospital pump.
3. Nitroglycerin drip, supplied by the sending facility. Insure sufficient volume is taken to complete the transport.

Administrations Guidelines

1. Dosing
   A. Nitroglycerin may be mixed in D5W or NS. Dosing chart: see Table I.
   B. For pre-hospital use begin the nitroglycerin drip at 10 mcg/min and increase by 10 mcg/min at 5 minute intervals if chest pain persists and systolic blood pressure remains above 100 mmHg.
   C. If titrating nitroglycerin for Pulmonary Edema / CHF, titrate until systolic BP is 120 mmHg or below.
   D. For inter-hospital patient transfers a nitroglycerin drip may be continued at the rate begun at the transferring hospital. Titrate the drip as above to relieve chest pain or per sending facility orders.

2. Patient monitoring
   A. If pain resolves completely, maintain drip at current rate of administration.
   B. If pain continues, increase the drip rate by 10 mcg/min every 5 minutes until pain resolves or systolic BP falls below 100 mmHg.
   C. Maximum dose is 200 mcg/min.
   D. If systolic BP falls below 90 mmHg during titration, decrease the drip rate by 10 mcg/min and give a NS IV/IO fluid bolus up to 1 liter, wide open. If BP remains below 90 mmHg, discontinue drip.

Table I. Dosing Chart for Nitroglycerin

	Amount to infuse in ml/hr	
Dose (mcg/min)	50 mg/250 ml 100 mg/500 ml (200 mcg/ml)	100 mg/250 ml 200 mg/500 ml (400 mcg/ml)
10	3	1.5
20	6	3
30	9	5
40	12	6
50	15	8
60	18	9
70	21	10
80	24	12
90	27	14
100	30	15
110	33	17
120	36	18
130	39	19
140	42	21
150	45	23
160	48	24
170	51	26
180	54	27
190	57	29
200	60	30

Nitroglycerin Drip Training Guidelines

Suggested Training Requirements for Paramedics

1. Training requirements for paramedics = 2 hours
   A. Nitroglycerin training = 1 hour
   B. Pump training = 1 hour

2. Pharmacology and actions of nitroglycerin
   A. Cardiovascular effects
      a. Decreases preload: reduces venous tone, decreasing venous load on the heart.
      b. Decreases afterload: reduces peripheral vascular resistance.
      c. Increases myocardial oxygen supply: causes dilatation of coronary arteries and relief of coronary artery spasm.
   B. Generalized effect: causes generalized smooth muscle relaxation

3. Administrations Guidelines
   A. Dosing
      a. Nitroglycerin may be mixed in D5W or NS. Dosing chart: see Table I.
      b. For pre-hospital use begin the nitroglycerin drip at 10 mcg/min and increase by 10 mcg/min at 5 minute intervals if chest pain persists and systolic blood pressure remains above 100 mmHg.
      c. If titrating nitroglycerin for Pulmonary Edema / CHF, titrate until systolic BP is 120 mmHg or below.
      d. For inter-hospital patient transfers a nitroglycerin drip may be continued at the rate begun at the transferring hospital. Titrate the drip as above to relieve chest pain or per sending facility orders.

4. Patient monitoring and titration of nitroglycerin drip
   A. Patient should be have continuous cardiac rhythm monitoring and frequent blood pressure monitoring. Blood pressure should be rechecked after each dosing change.
   B. If pain resolves completely, maintain drip at current rate of administration.
   C. If pain continues, increase the drip rate by 10 mcg/min every 5 minutes until pain resolves or systolic BP falls below 100 mmHg.
   D. Maximum dose is 200 mcg/min.
   E. If systolic BP falls below 90 mmHg during titration, decrease the drip rate by 10 mcg/min and give a NS IV/IO fluid bolus up to 1 liter, wide open. If BP remains below 90 mmHg, discontinue drip.

5. Side effects and special notes
   A. Peripheral vasodilatation can cause profound hypotension and reflex tachycardia.
   B. Common side effects: throbbing headaches, flushing, dizziness

C. Less common: orthostatic hypotension, sometimes marked. Nitroglycerin does not provide controlled hypotension.
D. Because nitroglycerin causes generalized smooth muscle relaxation, it may be effective in relieving chest pain caused by esophageal spasm.

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