

Tuolumne County Emergency Medical Services Agency
EMS System Policies and Procedures

Policy: Intravenous Nitroglycerin Infusions during Inter-facility Transfer **#552.83**

Creation Date: 6-24-99

Medical Director: _____

Revision Date:

EMS Coordinator: _____

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I. AUTHORITY

Division 2.5, California Health and Safety Code, Sections 1797.220 and 1797.221;
California Code of regulation, Division 9, Section 100144; and State EMS Authority
Guideline #125

II. PURPOSE

The purpose of this policy is to authorize paramedics to monitor and adjust intravenous
nitroglycerine infusions in adult patients during inter-facility transport.

III. POLICY

- A. Paramedics, in accordance with the provisions of this policy, may accept patients
for inter-facility transport with pre-existing intravenous nitroglycerine infusions.
- B. Nitroglycerine drips may not be initiated by paramedics.
- C. Every paramedic accredited in Tuolumne County must complete a training course
in monitoring nitroglycerine infusions during inter-facility transport.

IV. PROCEDURE

- A. Patients shall be placed and maintained on a cardiac monitor, blood pressure
monitor and pulse oximetry monitor during transport.
- B. Signed transfer orders from the transferring physician must be obtained prior to
transport. Transfer orders must certify that the patient is stable for transfer and
provide orders for maintaining the nitroglycerine infusion during transport.
- C. Paramedics may re-start nitroglycerine infusions if the nitroglycerine infusion is
interrupted due to infiltration, accidental disconnection of the IV line,
malfunctioning pump, etc. All lines must be restarted in accordance with the
transferring physician's orders.

- D. Nitroglycerine drips must be in the form of a piggyback monitored by a mechanical pump familiar to the paramedic. If a pump failure occurs and cannot be corrected, the paramedic is to discontinue the nitroglycerine infusion and notify the transferring hospital.
- E. The following parameters shall apply to all patients with pre-existing nitroglycerine infusions:
 - 1. Infusion fluid D5W or NS.
 - 2. Medication concentration shall be 25 mg/250cc or 50 mg/250cc.
 - 3. Infusion rates shall remain within parameters established by the transferring physician but in no case will rate adjustments be made at greater than 10 µg/minute in a 5-10 minute interval, except when discontinuing the infusion.
 - 4. Maximum drip rate shall not exceed 200 µg per minute.
 - 5. Vital signs shall be monitored and documented every 10 minutes during transport or every 5 minutes if an increase in the drip rate is ordered by the base physician.

V. Quality Assurance:

- A. All calls involving the transfer of patients with pre-existing nitroglycerine infusions shall be reviewed through the ambulance provider's QA/QI program to determine compliance with policy and transferring physician orders. Reports of audits will be submitted to the EMS agency on request.

VI. General Information on Nitroglycerine:

- A. Nitroglycerine is a vasodilating agent that belongs to a group of drugs referred to as nitrates. Nitroglycerine acts to: relax vascular smooth muscle; vasodilate both arteries and veins (especially veins); increase venous pooling; decrease venous return to the heart; increase arterial relaxation; decrease systemic vascular resistance; decrease cardiac workload; decrease cardiac oxygen consumption; dilate the large epicardial arteries; and lower diastolic more than systolic blood pressure.
- B. Pharmacokinetics:
 - 1. SL: Onset 1-3 minutes; duration 30 minutes;
 - 2. Transdermal (patch): Onset 0.5 - 1 hour; duration 12-24 hours;
 - 3. Transdermal (ointment): Onset 0.5-1 hour; duration 2-12 hours;
 - 4. PO (sustained release): Onset 20-40 minutes; duration 3-8 hours;
 - 5. IV: Onset usually immediate; duration is variable.
 - 6. Metabolized by the liver;
 - 7. Excreted in urine;
 - 8. Half-life of 1-4 minutes.
- C. Indications for the use of Nitroglycerine:
 - 1. Sublingual:
 - a. Relief of acute anginal pain or related ischemic symptoms;

- b. Congestive Heart Failure (CHF) to decrease myocardial workload.
- 2. Intravenous:
 - a. Diagnosed MI or unstable angina pectoris, even in the absence of chest pain, to decrease myocardial workload;
 - b. Relief of persistent ischemic chest pain that does not respond to other medications;
 - c. Hypertension when associated with diagnosed MI or unstable angina pectoris (not used solely for blood pressure control.)
- D. Contraindications:
 - 1. Allergy to nitrates;
 - 2. Increased intra cerebral pressure such as in cases of stroke, head trauma or intra cerebral bleeding;
 - 3. Hypotension;
 - 4. Hypovolemia
 - 5. Treatment of hypertension without progressively worsening signs of organ damage, ischemia or neurologic deficit.
- E. Precautions:
 - 1. Pregnancy (class C);
 - 2. Glaucoma patients (can increase intraocular pressure);
 - 3. Lactation (fetal effects in animal studies);
 - 4. May require decreased dosing in patients with liver disease..
- F. Adverse Effects:
 - 1. Hypotension;
 - 2. Headache (from vasodilation);
 - 3. Dizziness and syncope (from hypotension);
 - 4. Nausea/Vomiting;
 - 5. Tachycardia (in response to hypotension);
 - 6. Paradoxical bradycardia (in rare instances);
 - 7. Pallor, sweating (from hypotension);
 - 8. Flushing, sweating (from vasodilation);
 - 9. Rash, if allergic to nitrates.
- G. Interactions:
 - 1. Alcohol - combines with nitroglycerine can worsen hypotension;
 - 2. Aspirin - can increase serum nitrate concentrations;
 - 3. Calcium channel blockers - combined with nitroglycerine can worsen orthostatic hypotension;
 - 4. β -blockers, diuretics, anti-hypertensives - can increase actions of nitroglycerine.
- H. Standard Dosages for Nitroglycerine drips:
 - 1. For diagnosed patients with ischemic symptoms:
 - a. Continuous IV Infusion: starting at 10-20 μ g/min and increased by 5 or 10 μ g/min every 5 to 10 minutes until the desired hemodynamic or clinical response is achieved. Most patients

respond to 50 to 200 µg/min, and the lowest possible dose should be used. When indicated, rates should be decreased in 10 minute intervals.

I. Special Considerations:

1. Glass infusion bottles and non-polyvinyl tubing must be used as plastics will absorb nitroglycerine and alter the dose administered.
2. Do not use in-line filters.
3. Attach drip to port closest to catheter insertion