



Northwest Community EMS System

Date: March 5, 2008 **System Memo: # 310**
To: All System Members **PLEASE POST**
From: John M. Ortinau, M.D., FACEP
EMS Medical Director
RE: **Clarification on the use of NTG**

The System has been asked to clarify our position with respect to giving NTG to a variety of ACS and pulmonary edema patients so the field EMS personnel and ECRNs are on the same page. Please forward this information to all paramedics and ECRNs in your hospital/agency.

1. Pt's 12-L states "inferior infarction – age undetermined," can I give NTG?

- o Yes, as long as there are no other contraindications.
- o A "Q" wave, without any ST/T changes will trigger the 12-L ECG to interpret an old MI as "age undetermined."

2. Pt's 12-L states "Acute MI Suspected....suspect Inferior injury or infarction," can I give NTG?

Only with a physician order.

The following is from the 2005 AHA guidelines:

- o RV infarction or ischemia may occur in up to 50% of pts with inferior wall MI. The clinician should suspect RV infarction in pts with inferior wall infarction, hypotension, and clear lung fields.
- o Patients with RV dysfunction and acute infarction are dependent on maintenance of RV "filling" pressure (RV end-diastolic pressure) to maintain cardiac output. Thus, nitrates, diuretics, and other vasodilators (ACE inhibitors) should be avoided because severe hypotension may result. Hypotension is often easily treated w/ an IVF bolus.

3. What are the contraindications for NTG?

The AHA lists the following as class III recommendations (should not be performed/administered... not helpful and may be harmful) for NTG:

- o Hypotension: SBP < 90, or > 30mm Hg below baseline
- o Bradycardia: HR less than 50
- o Tachycardia: HR greater than 100
- o Recent (24-48 h) use of phosphodiesterase inhibitor for erectile dysfunction (e.g., Viagra, Cialis, Levitra)

4. Can NTG be given to the pt with pulmonary edema due to acute heart failure (HF) with a HR above 100?

Yes, most pts in acute HF will be tachycardic. In this situation, it is currently believed that the benefit of giving the drug outweighs the risk.

If pulmonary edema is thought to be related to an underlying tachydysrhythmia (rapid AF, SVT, or VT), the treatment is correction of the underlying rhythm. For rates between 100 and 140, NTG is acceptable with close monitoring of BP and HR.

See the attached Nitroglycerin (NTG) FAQs document as a full reference quoting the 2005 AHA guidelines.

Northwest Community EMS System Nitroglycerin (NTG) FAQs

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From AHA Guidelines 2005:

Nitroglycerin is an effective analgesic for ischemic chest discomfort. It also has beneficial hemodynamic effects, including dilation of the coronary arteries (particularly in the region of plaque disruption), the peripheral arterial bed, and venous capacitance vessels. The treatment benefits of nitroglycerin are limited, however, and no conclusive evidence has been shown to support routine use of IV, oral, or topical nitrate therapy in patients with AMI. With this in mind, these agents should be carefully considered, especially when low blood pressure precludes the use of other agents shown to be effective in reducing morbidity and mortality (eg, β -blockers and angiotensin-converting enzyme [ACE] inhibitors).

IV nitroglycerin is indicated in the following clinical situations (Class I):

- Ongoing ischemic chest discomfort
- Management of hypertension
- Management of pulmonary congestion

Patients with ischemic discomfort may receive up to 3 doses of sublingual or aerosol nitroglycerin at 3- to 5-minute intervals until pain is relieved or low blood pressure limits its use (Class I). IV nitroglycerin is indicated for ongoing chest discomfort, control of hypertension, or management of pulmonary congestion in patients with STEMI associated with LV failure (Class I). In patients with recurrent ischemia, nitrates are indicated in the first 24 to 48 hours. IV rather than long-acting preparations should be used acutely to enable titration.

Do not use nitrates (Class III) in patients with hypotension (SBP <90 mm Hg or >30 mm Hg below baseline), extreme bradycardia (<50 bpm), or tachycardia (>100 bpm). Administer nitrates with extreme caution if at all to patients with suspected inferior wall MI with possible right ventricular (RV) involvement because these patients require adequate RV preload. Do not administer nitrates (Class III) to patients who have received a phosphodiesterase inhibitor for erectile dysfunction within the last 24 hours (longer for some preparations).

IV nitroglycerin is also an effective adjunct in the treatment of congestive heart failure from any cause, and it may be useful in hypertensive emergencies, particularly if related to volume overload. The action of nitroglycerin is mediated through local endothelial production of nitric oxide, particularly in the venous capacitance system. Nitroglycerin is most effective in patients with increased intravascular volume. Hypovolemia blunts the beneficial hemodynamic effects of nitroglycerin and increases the risk of hypotension; nitrate-induced hypotension typically responds well to fluid replacement therapy. Other potential complications of use of IV nitroglycerin are tachycardia, paradoxical bradycardia, hypoxemia caused by increased pulmonary ventilation-perfusion mismatch, and headache.