



CHF / Pulmonary Edema

History

- Congestive heart failure
- Past medical history
- Medications (digoxin, Lasix, Viagra / sildenafil, Levitra / vardenafil, Cialis / tadalafil)
- Cardiac history --past myocardial infarction

Signs and Symptoms

- Respiratory distress, bilateral rales
- Apprehension, orthopnea
- Jugular vein distention
- Pink, frothy sputum
- Peripheral edema, diaphoresis
- Hypotension, shock
- Chest pain

Differential

- Myocardial infarction
- Congestive heart failure
- Asthma
- Anaphylaxis
- Aspiration
- COPD
- Pleural effusion
- Pneumonia
- Pulmonary embolus
- Pericardial tamponade
- Toxic Exposure

	Airway Protocol(s) AR 1, 2, 3 as indicated
	Chest Pain and STEMI Protocol AC 4 if indicated
B	12 Lead ECG Procedure
	Nitroglycerin 0.3 / 0.4 mg Sublingual Repeat every 5 minutes x 3 if prescribed to patient and (BP >100)
P	Cardiac Monitor
	IV / IO Procedure

Assess Symptom Severity

MILD
Normal Heart Rate
Elevated or Normal BP

MODERATE / SEVERE / SCAPE
Elevated Heart Rate
Elevated BP

CARDIOGENIC SHOCK
Tachycardia followed by bradycardia
Hypertension followed by hypotension

A
Nitroglycerin 0.3 / 0.4 mg SL
Repeat every 5 minutes

Improving

YES

NO

B
Airway NIPPV Procedure

Nitroglycerin 400 mcg IV slow push for systolic BP 140 – 160 every 5 min as needed – max 3 doses

Nitroglycerin 600 mcg IV slow push for systolic BP > 160 every 5 min as needed – max 2 doses

Nitro Drip – See Page 2
Start 100mcg/min
Increase by 50mcg/min q 5min

P
Consider **Furosemide 40 mg IV ONLY IF**
Transport time > 30 minutes
Known CHF / Daily Lasix / Afebrile

B
Remove NIPPV **if in place**

Adult Hypotension / Shock Protocol AM 5 **if indicated**

Notify Destination or Contact Medical Control



CHF / Pulmonary Edema

PUSH DOSE NITRO plus drip – Sympathetic Crashing Acute Pulmonary Edema (SCAPE)

Administer Nitroglycerin 400 mcg IV slow push for systolic BP between 140 – 160
May repeat x2 every 5 minutes as needed (Max 3 doses total)

Administer Nitroglycerin 600 mcg IV slow push for systolic BP greater than 160
May repeat x2 every 5 minutes as needed (Max 2 doses total)

May draw up with caution as not come in contact with Nitro or use pump to admin bolus.

If close proximity to the hospital / short transport time – may hold off on drip unless using IV pump for boluses.

Start Nitro Drip 100 mcg/min – Increase by 50 mcg/min q 5 minutes

Max 800 mcg/min – Hold if SBP <100

If SBP < 90 stop drip – restart if BP recovers after 5 minutes at 100 mcg/min

Pearls

- **Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- **Items in Red Text are key performance measures used to evaluate protocol compliance and care**
- **Diuretics (furosemide) and opioids have NOT been shown to improve the outcomes of EMS patients with pulmonary edema. Even though this historically has been a mainstay of EMS treatment, it is no longer routinely recommended.**
- **Nitroglycerin:**
 - **Avoid Nitroglycerin in any patient who has used Viagra (sildenafil) or Levitra (vardenafil) in the past 24 hours or Cialis (tadalafil) in the past 36 hours due to potential severe hypotension.**
 - **Nitroglycerin may cause hypotension during any type myocardial infarction. It is NOT more likely to cause hypotension in an inferior MI and should NOT be avoided unless already hypotensive.**
- **Document the time of the 12-Lead ECG in the PCR as a Procedure along with the interpretation (Paramedic).**
- **Consider myocardial infarction in all these patients. Diabetics, geriatric and female patients often have atypical pain, or only generalized complaints.**
- **Cardiac related symptoms in men and women:**
 - **Pressure, squeezing, fullness, or pain in the chest.**
 - **Pain or discomfort in one or both arms, the back, neck, jaw, or stomach.**
 - **Shortness of breath with or without chest pain.**
 - **Sweating, nausea, weakness, and/or lightheadedness.**
 - **Women, diabetic patients, and the elderly often experience only weakness, shortness of breath, nausea/ vomiting, and back or jaw pain.**
- **If patient has taken nitroglycerin without relief, consider potency of the medication.**
- **Contraindications to opioids include severe COPD and respiratory distress. Monitor the patient closely.**
- **Monitor for hypotension after administration of nitroglycerin and opioids.**
- **Allow the patient to be in their position of comfort to maximize their breathing effort.**
- **EMT may administer Nitroglycerin to patients. May give from EMS supply.**
- **Agency medical director may does not require Contact of Medical Control.**