



Chest Pain: Cardiac and STEMI



History

- Age
- Medications (Viagra / sildenafil, Levitra / vardenafil, Cialis / tadalafil)
- Past medical history (MI, Angina, Diabetes, post menopausal)
- Allergies
- Recent physical exertion
- Onset / Palliation / Provocation
- Quality (crampy, constant, sharp, dull, etc.)
- Region / Radiation / Referred
- Severity (1-10)
- Time (onset / duration / repetition)

Signs and Symptoms

- CP (pain, pressure, aching, vice-like tightness)
- Location (substernal, epigastric, arm, jaw, neck, shoulder)
- Radiation of pain
- Pale, diaphoresis
- Shortness of breath
- Nausea, vomiting, dizziness
- **Time of Onset**
- Women:
 - More likely to have dyspnea, N/V, weakness, back or jaw pain

Differential

- Trauma vs. Medical
- Angina vs. Myocardial infarction
- Pericarditis
- Pulmonary embolism
- Asthma / COPD
- Pneumothorax
- Aortic dissection or aneurysm
- GE reflux or Hiatal hernia
- Esophageal spasm
- Chest wall injury or pain
- Pleural pain
- Overdose: Cocaine or Methamphetamine

B	12 Lead ECG Procedure
	Aspirin 81 mg x 4 PO (chewed) Or 325 mg PO
	Nitroglycerin 0.3 / 0.4 mg Sublingual Repeat every 5 minutes x 3 <i>if prescribed to patient and (BP ≥ 100)</i>
P	Cardiac Monitor

Acute MI / STEMI
See box to right

NO

IV / IO Protocol UP 6	
A	Nitroglycerin 0.3 / 0.4 mg SL Repeat every 5 minutes as needed
P	Morphine 2 – 4 mg IV / IO Repeat every 5 minutes as needed Maximum 10 mg Or Fentanyl 50 – 75 mcg IV / IO Repeat 25 mcg every 20 minutes as needed Maximum 200 mcg
Hypotension / Shock Protocol AM 5 <i>if indicated</i>	
CHF / Pulmonary Edema Protocol AC 5 <i>if indicated</i>	

Transport based on:

STEMI

EMS Triage and Destination Plan
Immediate Notification of Facility
Immediate Transmission of ECG
if capable
Keep Scene Time to ≤ 15 Minutes

B

If transporting to Non PCI Center
Reperfusion Checklist

Acute MI / STEMI

STEMI Definition:

- **≥ 1 mm ST Segment elevation in ≥ 2 contiguous leads**
- **≥ 2 mm ST/J point elevation in V2-V3 for men**
- **≥ 1.5 mm ST/J point elevation in V2-V3 for women**
- **ECG software diagnoses Acute MI (symptomatic)**

**Notify Destination or
Contact Medical Control**



Chest Pain: Cardiac and STEMI



Presume chest pain is of a cardiac etiology unless age, circumstances, history and exam clearly suggest a non-cardiac cause.

Typical features such as chest and left arm pain associated with dyspnea, diaphoresis and nausea are often not present in the elderly, women and patients with diabetes. Their complaints may be very vague such as nausea and weakness or isolated dyspnea.

General:

Utilize oxygen to maintain oxygen saturation $\geq 92\%$. Aspirin therapy is very important and should be given when not contraindicated. If the patient has taken, for example a 81 mg baby aspirin, give three additional to equal 4, etc.

Nitroglycerin:

Give every 5 minutes until pain or symptom relief and/or SPB < 100 mmHg,

Use cautiously in patients with bradycardia < 50 or very rapid heart rates > 120 with serious signs / symptoms or heart failure.

Nitroglycerin may cause hypotension in any MI type, not just inferior MI as commonly taught.

STEMI:

Goal is now from first provider contact, YOU, to first device deployment (cardiologist in cath-lab) of ≤ 90 minutes when transporting to a PCI-Center. Identify STEMI (ECG < 10 minutes from patient contact) and transmit, expedite transport and notify the receiving hospital immediately. The rate limiting step, especially after business hours (3 PM), is assembling cath-lab team and having them arrive and prepare for cardiac catheterization. Quick recognition of STEMI and immediate notification of receiving PCI-Center is essential in meeting this goal to improve patient care / outcomes. After business hours the cath-lab team should be traveling to the hospital during your transport. It is of no value to arrive at the hospital quickly when the cath-lab was notified late, the patient still waits until the cath-lab can be prepared for the procedure. Report 1. Active Chest Pain; 2. ECG meets STEMI criteria; 3. Agreement with ECG.

- Establish 2 IV sites preferably both in the Left Upper Extremity if possible and remove all clothing prior to facility arrival.

Forsyth Medical Center Encode with STEMI:

Wake Forest University Baptist Medical Center Encode with STEMI:

High Point Medical Center Encode with STEMI:

Moses H Cone Memorial Hospital Encode with STEMI:

All hospital cardiologists are within the same group at each facility.

Patient's name and DOB help the ED staff retrieve an old ECG for comparison.

ALL TRANSMITTED ECGs MUST HAVE NAME, AGE and GENDER as available. ECG is a medical record and must have appropriate identifier, especially a correctly spelled First and Last NAME.

AICD Firing: If patient has experienced 1 AICD firing and has no other symptoms no anti-arrhythmic is required. If AICD fires ≥ 2 then begin **Lidocaine 1 mg / kg IV / IO**. If no improvement repeat **Lidocaine 1 mg/kg every 10 minutes to maximum of 3 mg/kg**. **Amiodarone** may be used depending on availability.

Pearls

- Recommended Exam: Mental Status, Skin, Neck, Lung, Heart, Abdomen, Back, Extremities, Neuro**
- Items in Red Text are the key performance indicators for the EMS Acute Cardiac (STEMI) Care Toolkit**

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.

STEMI (ST-Elevation Myocardial Infarction)

Positive Reperfusion Checklist should be transported to the appropriate facility based on STEMI EMS Triage and Destination Plan.

Consider placing 2 IV sites in the left arm: Many PCI centers use the right radial artery for intervention.

Consider placing defibrillator pads on patient as a precaution.

Consider Normal Saline or Lactated Ringers bolus of 250 – 500 mL as pre-cath hydration.

Scene time goal is < 15 minutes.

Document and time-stamp facility STEMI notification and make notification as soon as possible.

Document the time of the 12-Lead ECG in the PCR as a Procedure along with the interpretation (Paramedic).

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.

EMT:

- EMT administration of Nitroglycerin is limited to patients currently prescribed the medication, unless approved by the Agency Medical Director and the NC office of EMS.**
- If patient has taken nitroglycerin without relief, consider potency of the medication.
- Monitor for hypotension after administration of nitroglycerin and opioids.
- Agency medical director may require Contact of Medical Control prior to administration.