



# Portage County EMS Patient Care Guidelines

## Acute Coronary Syndrome including STEMI

### Note:

- The goal is to deliver a STEMI patient to a cardiac center within 60 minutes of first ALS patient contact.
- Cardiac chest pain (angina) is usually vaguely described, often as pressure, tightness, heaviness or squeezing.
- Patients suspected of having Acute Coronary Syndrome (ACS) without a specific complaint of chest pain will still be treated using this protocol.

<b>Priorities</b>	<b>Assessment Findings</b>
Chief Complaint	Heavy, vague, squeezing, pressure-like, dull or achy, discomfort or pain. Other non-chest pain complaints that the provider feels may be cardiac-related such as nausea & vomiting, weakness, syncope, diaphoresis, shortness of breath or other pain.
LOPQRST	Identify location and radiation, onset, duration progression and severity, presence of intermittent or fluctuating symptoms, factors that provoke (exertion) or palliate (rest) the pain.
AS/PN	Radiation, dyspnea, nausea/vomiting. Pain that is aggravated by breathing and coughing (does not exclude ACS). Cough with fever/chills.
AMPL	History of coronary artery disease or risk factors for it. Use of cardiac medications, including aspirin. History of DVT or PE.
Initial Exam	Check ABCs and correct any immediate life threatening problems.
Detailed Focused Exam	<b>Vital Signs:</b> BP, HR, RR, Temp, SpO <sub>2</sub> <b>General Appearance:</b> Anxious? Sense of impending doom? Denial? <b>Skin:</b> Cool, pale diaphoretic, ashen? <b>Neck:</b> JVD? <b>Chest:</b> Laboring to breathe? <b>Lungs:</b> Wheezes, rales, rhonchi? Decreased breath sounds? <b>Heart:</b> Rate, regularity? <b>Arms &amp; Legs:</b> Pedal edema? Radial/pedal pulse assessment. <b>Neuro:</b> ALOC?
Data	Record an accurate "At patient" time for ALS providers Obtain 12-lead EKG within 10 minutes of arrival, SpO <sub>2</sub> , ETCO <sub>2</sub> , Blood glucose if diabetic or ALOC
Goals of Therapy	<ul style="list-style-type: none"> <li>• Minimize total ischemic time</li> <li>• Reduce chest pain or other ACS symptoms; reduce risk of lethal arrhythmias; early identification of STEMI[1].</li> </ul>
Monitoring	Cardiac monitoring, SpO <sub>2</sub> , capnography

### EMERGENCY MEDICAL RESPONDER

- Routine Medical Care.
- Administer oxygen 2 – 4 LPM per nasal cannula if SpO<sub>2</sub> < 94% or evidence of respiratory distress. Increase flow and consider non-rebreather mask if needed to keep SpO<sub>2</sub> > 94%
- If the patient is having difficulty breathing, allow them to sit upright.
- Gather pertinent cardiac history details

- Cardiac risk factors: hypertension, cardiac surgery, high cholesterol, smoking, family history, diabetes.
- History of deep vein thrombosis (DVT) or pulmonary embolism (PE).
- Has patient taken Viagra or Levitra in the last 24 hours or Cialis in the last 48 hours? Consult Medical Control if the patient is taking other erectile dysfunction medications.
- Has patient taken aspirin or nitroglycerin and if so how much?
- Administer **aspirin** 324 mg PO (four 81 mg chewable tablets) unless the patient is allergic to it. Advise patient to chew & swallow tablets.
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*Give a status report to the ambulance crew by radio ASAP.*

### EMERGENCY MEDICAL TECHNICIAN

- If patient experiences angina, assist the patient in administering the patient's prescribed **nitroglycerin** (NTG) sublingually, unless the systolic BP < 100 mmHg.
  - **No NTG if pt has used Viagra or Levitra in the last 24 hours, or Cialis in the last 48 hours.**
- Repeat nitroglycerin dose every 5 minutes until pain is relieved. Repeat vital signs prior to each dose.
- Discontinue nitroglycerin if the systolic BP drops below 100 mmHg.
- Document all vital signs and the number of nitroglycerin doses given.

*Give a status report to the ambulance crew by radio ASAP.*

### ADVANCED EMERGENCY MEDICAL TECHNICIAN

- Initiate EKG monitoring and obtain a 12 lead EKG and transmit to receiving facility. If transmission is not possible, may read monitor's interpretation to hospital
- IV normal saline @ KVO
- **If possible avoid IV access from mid forearm down if possible, especially with the right arm because many cardiac catheterizations are performed via the radial artery**
- If the SBP < 100 mmHg, give a 500 mL fluid bolus, and then reassess
- Administer **NTG** SL, 1 spray unless the systolic BP < 100 mmHg. May repeat one spray every 5 minutes until pain is gone unless SBP < 100
  - If the 12 lead EKG interpretation includes "inferior infarct", use extreme caution in administering NTG to avoid refractory hypotension

*Contact Medical Control for the following:*

- Additional fluid boluses are needed for persistent hypotension
- Early notification of Medical Control if an acute STEMI[1] is indicated on the 12-lead EKG

### INTERMEDIATE

- For confirmed or suspected **STEMI**, refer to STEMI Destination Determination Algorithm [2]
- Notify Medical Control immediately of STEMI or suspected STEMI

- Consider **fentanyl** 25 – 50 mcg IV[3]. May repeat every 5 – 10 minutes as needed to a max. of 200 mcg.
- If 12-lead EKG shows an acute STEMI[1]
  - Perform fibrinolytic/ heparin questionnaire[4].
  - Consider paramedic intercept for unstable patient
  - Once a STEMI is identified, further EKGs are unnecessary

*Contact Medical Control for the following:*

- Additional dosages of fentanyl.
- Any positive responses to the heparin/ fibrinolytic screenings

## PARAMEDIC

- For confirmed or suspected STEMI, refer to STEMI Destination Determination Algorithm [2]
- If 12-lead EKG shows an acute **STEMI**[1]
  - Perform fibrinolytic screening/ heparin questionnaire[4].
  - If ALL responses to the heparin questionnaire are “NO”, give **Heparin** 4000 unit bolus IV with a 10 ml NS flush.
- **Nitroglycerin (NTG)**
  - Continue NTG SL doses every 5 minutes until the desired effect of the nitroglycerin is reached.
  - Start NTG Infusion via IV pump at 10 mcg/min.
  - Reassess pain and repeat blood pressure every 5 minutes
  - If the pain persists, and if the blood pressure remains above 100 mmHg, increase the NTG drip by 10 mcg/min every 5 minutes to a maximum drip rate of 50 mcg/min.
  - Endpoint of therapy is control of chest pain. Maintain the NTG drip at a steady level once the patient reaches a point of being pain free or nearly pain free (subjective pain score of 0 – 1 out of 10). Discontinue NTG SL doses.
  - If blood pressure drops below 100 mmHg systolic, decrease the NTG infusion by 10 mcg/min and discontinue SL doses. Reassess blood pressure every 5 minutes.
  - If the blood pressure drops to below 100 mmHg early in the course of treatment with NTG, consider an RV infarction, discontinue nitroglycerin SL doses, and initiate a fluid bolus of 250 ml of NS.
- Ticagrelor (Brilinta)
  - Administer 180mg PO if intended destination is a Primary PCI center and no “Yes” responses to Fibrinolytic/Heparin Questionnaire (See STEMI Destination Determination Algorithm)
  - Contraindications: hypersensitivity/allergy or “Yes” response to Fibrinolytic/Heparin Questionnaire other than allergy to heparin/fibrinolytics
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*Contact Medical Control for the following:*

- Early notification if an acute STEMI[1] is apparent on the 12-lead EKG
- Consider for tachycardia or hypertension, **metoprolol** 5 mg IV every 5 minutes x 3 doses
  - Hold if SBP < 100 or HR < 60

- Failure of the patient's pain to resolve once you've reached 50 mcg/min of NTG infusion
- Any positive responses to the heparin or fibrinolytic screenings

## FOOTNOTES:

### [1] STEMI definition

- EKG demonstrates ST elevation greater than 0.1 mV in at least 2 contiguous precordial leads (V1 – V6) or at least 2 adjacent limb leads
- EKG demonstrates new left bundle branch block
- Reperfusion therapy is indicated if the EKG is diagnostic for STEMI even if the patient is free of symptoms
- If initial EKG is not diagnostic but clinical suspicion is high for STEMI, obtain serial EKGs at 5 to 10 minute intervals

### [2] STEMI Destination Determination Algorithm

- The goal is to deliver a STEMI patient to a cardiac center within 60 minutes of first ALS patient contact.
  - Note: If the patient is at a physician's office or a walk-in clinic, the time begins when they arrive at the office or clinic
- After considering all operational factors (weather, roads, distance, patient access issues, etc.) if the providers feel that the patient could be delivered to a cardiac center within the 60 minute goal, the EMS crew will contact medical control to:
  - Confirm STEMI activation
  - Identify available cardiac center(s)
  - Notify the receiving cardiac center
  - Relay patient's name and date of birth
  - Receive additional orders
- Ascension Saint Michael's Hospital medical control will contact the receiving facility to relay patient information
  - Follow up patient information (i.e. additional 12-lead EKGs) may be sent directly to the receiving facility
- Whenever possible, a third person should be used as a driver.

### [3] Morphine sulfate may be substituted for fentanyl during a medication shortage. Morphine 2 – 5 mg IV every 5 minutes with a maximum of 10 mg.

### [4] Fibrinolytic/ heparin screening

- Active bleeding within 10 days (to include GI)
- Surgery or trauma in the last 14 days
- CVA/stroke/other neurological symptoms
- New onset altered mental status.
- History of arteriovenous malformation (AVM)
- History of aneurysm
- Allergy to heparin
- Pregnancy
- Severe hypertension (Systolic > 180 or diastolic > 110)
- Sharp or tearing chest pain that radiates to the shoulder blades (suspected aortic dissection)

- History of CVA, arteriovenous malformation (AVM), cerebral aneurysm
- Allergy to fibrinolytics
- Prior treatment from a fibrinolytic? If so, which one?

Date of Origin: 3/25/14	Medical Director Approval:
Date of This Revision: May 2018	Electronically signed
Date of Review:	Michael Clark, MD