

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.

Priorities	Assessment Findings
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	Vital Signs: BP, HR, RR, Temp, SpO ₂ General Appearance: Anxious? Sense of impending doom? Denial? Skin: Cool, pale diaphoretic, ashen? Neck: JVD? Chest: Laboring to breathe? Lungs: Wheezes, rales, rhonchi? Decreased breath sounds? Heart: Rate, regularity? Arms & Legs: Pedal edema? Radial/pedal pulse assessment. Neuro: ALOC?
Data	Record an accurate "At patient" time for ALS providers Obtain 12-lead EKG within 10 minutes of arrival, SpO ₂ , ETCO ₂ , Blood glucose if diabetic or ALOC
Goals of Therapy	<ul style="list-style-type: none"> • Minimize total ischemic time • Reduce chest pain or other ACS symptoms; reduce risk of lethal arrhythmias; early identification of STEMI[1].
Monitoring	Cardiac monitoring, SpO ₂ , capnography

EMERGENCY MEDICAL RESPONDER

- Routine Medical Care.
- Administer oxygen 2 – 4 LPM per nasal cannula if SpO₂ < 94% or evidence of respiratory distress. Increase flow and consider non-rebreather mask if needed to keep SpO₂ > 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.

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 Access: Attempt to obtain TWO IV access but do NOT delay transport for second IV access attempts
- **If possible, avoid IV access from mid forearm down, especially with the right arm in the event the cardiac catheterization needs to be performed via the radial artery**
 - **If accessing the veins within the antecubital fossa preferentially place a 18g in the event the hospital needs to obtain a CT pulmonary angiogram**
- IV normal saline @ KVO
- 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** 60 units/kg [MAX 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).
 - 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, and initiate a fluid bolus of 250 ml of NS.
- **Metoprolol**
 - 2.5-5mg IV every 5 minutes (MAX 15mg) if
 - Blood pressure greater than 160 mmHg OR HR greater than 120
 - Hold for HR less than 60 OR SBP < 100

Contact Medical Control for the following:

- Early notification if an acute STEMI[1] is apparent on the 12-lead EKG
- 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

- Ascension Saint Michael's Hospital is the Primary STEMI Receiving Center
 - All patients with EKG meeting STEMI definition or clinical concerns for STEMI should be transported to Ascension St Michael's Hospital
 - Destinations other than Ascension St Michael's Hospital need to be approved by/at the direction of Medical Control
 - Possible indications: Ascension St Michael's Hospital Cath Lab Unavailable (Downtime, Cath In-progress), Patients with established relationship with Aspirus or Marshfield Clinic system **and** complicated medical history, Patient refusal of transport to Ascension St Michael's Hospital
- Marshfield Medical Center-Marshfield, Marshfield Medical Center-Weston, Aspirus Wausau Hospital are Secondary STEMI Receiving Center
 - Patients whom transport to Secondary STEMI Receiving Center offers a clear time benefit (patients at edge of response area, adverse road conditions)
 - Factors as noted above

[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?

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