Improving the System of Care for STEMI Patients - THE GUIDELINES 2016
Today’s Presentation - Dr. Doug Kosmicki and Dr. David Cornutt

1. Third Year - Updated Guidelines
2. Impact and adherence to Guidelines
3. Case - Reviews
How do we increase the number of patients with timely access to reperfusion therapy?

Mission: Lifeline STEMI SYSTEM OF CARE - Guidelines YEAR 3
Dr. Doug Kosmicki

- **Mission: Lifeline - Chair since 2014**
- **Presents on Mission: Lifeline and STEMI Guidelines**
- **Completed Outreach education to Critical Access Hospitals**
- **Works with Interventional Cardiology Steering Committee for Guideline Review and 2016 update**
“Where a patient lives should not determine if they live.”
Publications to Support STEMI System Development

Development of Systems of Care for ST-Elevation Myocardial Infarction Patients

Executive Summary

Endorsed by Aetna, the American Ambulance Association, the American Association of Critical-Care Nurses, the American College of Emergency Physicians, the Emergency Nurses Association, the National Association of Emergency Medical Technicians, the National Association of EMS Physicians, the National Association of State EMS Officers, the National EMS Information System Project, the National Rural Health Association, the Society for Cardiovascular Angiography and Interventions, the Society of Chest Pain Centers, and UnitedHealth Network

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Regional Systems of STEMI Care, Reperfusion Therapy, and Time-to-Treatment Goals

All communities should create and maintain a regional system of STEMI care that includes assessment and continuous quality improvement of EMS and hospital-based activities.

Performance can be facilitated by participating in programs such as Mission: Lifeline and the D2B Alliance.

Performance of a 12-lead ECG by EMS personnel at the site of FMC is recommended in patients with symptoms consistent with STEMI.
Barriers to Timely Reperfusion - These are improving

The patient

- Failure to promptly recognize symptoms
- Hesitation to seek medical attention

Time to transport

- Mandated delivery to the closest hospital, regardless of PCI capabilities
- **DIVERSIONS ARE OCCURRING IN NE**
- Long transport in rural areas

Decision process on arrival

- Clot-busting drugs vs. PCI
- Off hours
- Transfer to PCI facility

Time to implement treatment strategy

- Procedural factors
- Team assembly
The Reality of Today’s Patients

➤ Not all STEMI patients call 9-1-1

• 50% of STEMI patients present to their local emergency department (ED)
• In Rural NE 70% arrive by private vehicle

➤ “Walk-in” patients hinder:

• Registration
• Quick triage to electrocardiograms (ECG) for diagnosis
• ECG privacy
• Advance warning to activate hospital staff to prepare for reperfusion
The Ideal Patient

Patients and the public:

- Recognize the symptoms of STEMI
- Realize the importance of:
  - Activating emergency medical services (EMS) via 9-1-1 promptly
  - Getting treatment quickly
- Are familiar with their local hospital’s role in STEMI care
- Understand the implications of inter-hospital transfer for PCI

The ideal system:

- Promotes culturally competent education efforts
- Includes patient representatives on community planning coalitions
- Provides coordinated and patient-centered care
The Ideal STEMI-Referral Hospital

→ In an ideal system:

• Standardized protocols dictate transport of STEMI patients directly to a STEMI-receiving hospital based on:
  • Specific criteria for risk
  • Contraindications to fibrinolysis
  • The proximity of the nearest PCI service
• Patients presenting to a STEMI-referral hospital are treated according to standardized triage and transfer protocols
• Incentives are provided to rapidly:
  • Treat STEMI patients in accordance with ACC/AHA guidelines
  • Transfer to a STEMI-receiving hospital for primary PCI using:
    • Reperfusion checklists
    • Standard pharmacological regimens and order sets
    • Clinical pathways
• There is rapid and efficient data transfer, data collection and feedback
• Integrated plans for return of the patient to the community for care are provided
The Ideal STEMI-Receiving Hospital

In an ideal system:

• Pre-hospital ECG diagnosis of STEMI, ED notification and cath lab activation occurs according to standard algorithms

• Algorithms facilitate:
  • Transport directly from the field to the cath lab

• Single-call systems from STEMI-referral hospitals immediately activate the cath lab

• Primary PCI is provided as routine treatment for STEMI 24/7

• STEMI-receiving hospital’s administration puts their support in writing

• A multidisciplinary team meets regularly to identify and solve problems

• A continuing education program is designed and instituted

• A mechanism for monitoring performance, process measures and patient outcomes is established
Improving the System of Care for STEMI Patients

How is STEMI Defined & Identified?

- **Best diagnostic tool = 12-Lead ECG**

- STEMI is a complete blockage of a major vessel in the coronary vessels causing full thickness muscle damage or necrosis.

- NSTEMI is understood to involve partial thickness damage of heart muscle. Therefore, NSTEMI is less severe type of heart attack than STEMI.

### STEMI Criteria:

- ST elevation at the J point in:
  - **Men**: at least 2 contiguous leads of ≥2 mm (0.2 mV) in leads V2–V3 and/or ≥1 mm (0.1 mV) in other contiguous chest leads or the limb leads.
  - **Women**: ≥1.5 mm (0.15 mV) in leads V2–V3 and/or ≥1 mm (0.1 mV) in other contiguous chest leads or the limb leads.

- Signs & Symptoms of discomfort suspect for AMI (Acute Myocardial Infarction) or STEMI with a duration >15 minutes <12 hours.

- Although new, or presumably new, LBBB at presentation occurs infrequently and may interfere with ST-elevation analysis, care should be exercised in not considering this an acute myocardial infarction (MI) in isolation. If in doubt, immediate consult with PCI receiving center is recommended.

- If initial ECG is not diagnostic but suspicion is high for STEMI, obtain serial ECG at 5-10 minute intervals.
Nebraska Mission: Lifeline
Statewide STEMI Guideline for Non-PCI Hospitals

STEMI Criteria:

- ST elevation at the J point in
  - Men: at least 2 contiguous leads of \( \geq 2 \text{ mm} \) \( [0.2 \text{ mV}] \) in leads V2–V3 and/or \( \geq 1 \text{ mm} \) \( [0.1 \text{ mV}] \) in other contiguous chest leads or the limb leads.
  - Women: \( \geq 1.5 \text{ mm} \) \( [0.15 \text{ mV}] \) in leads V2–V3 and/or \( \geq 1 \text{ mm} \) \( [0.1 \text{ mV}] \) in other contiguous chest leads or the limb leads.
- Signs & Symptoms of discomfort suspect for AMI (Acute Myocardial Infarction) or STEMI with a duration \( > 15 \text{ minutes} \) \(< 12 \text{ hours} \).
- Although new, or presumably new, LBBB at presentation occurs infrequently and may interfere with ST-elevation analysis, care should be exercised in not considering this an acute myocardial infarction (MI) in isolation. If in doubt, immediate consult with PCI receiving center is recommended.
- If initial ECG is not diagnostic but suspicion is high for STEMI, obtain serial ECG at 5-10 minute intervals.

If ECG is transmitted from the field (EMS) and a STEMI is identified, the following should be done prior to patient arrival:

- Alert on-call provider if not in-house
- Activate Transferring agency (Air or Ground)
- Notify Receiving PCI Hospital Emergency Dept. Physician
- If Arrived by EMS, Leave Patient on Ambulance Cot

1st ECG time goal: 10 minutes from patient arrival
### PRIMARY PCI Pathway – FMC to PCI less than 120 minutes – ACTIVATE CATH LAB

- **Goal:** Door-in to Door-out in < 30 minutes

<table>
<thead>
<tr>
<th>Patient Care Priorities Prior to Transport or During Transport</th>
</tr>
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<tbody>
<tr>
<td>- Titrate oxygen (starting at 2L/min) to maintain SpO2 between 90%-94%</td>
</tr>
<tr>
<td>- Aspirin 324 mg PO chewable</td>
</tr>
<tr>
<td>- Cardiac Monitor &amp; attach hands-free defibrillator pads</td>
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<tr>
<td>- Obtain vital signs and pain scale</td>
</tr>
<tr>
<td>- Analgesia (Morphine sulfate or Fentanyl) IV PRN for pain</td>
</tr>
<tr>
<td>- Establish Saline Lock #1 large bore needle</td>
</tr>
</tbody>
</table>

**Administer one of the following:**

- Heparin - IV loading dose (70 Units/kg - max 4,000 units)

  **Optional to Heparin:**
  - Enoxaparin (Lovenox):
    - Age < 75: 30mg IV plus 1 mg/kg SC (max 100mg)
    - Age > 75: No bolus. 0.75 mg/kg SC (max 75mg)

**Then administer one of the following:**

- Clopidogrel (Plavix) 600 mg PO or:
- Ticagrelor (Brilinta) - 180mg PO

### FIBRINOLYSIS Pathway - FMC to PCI anticipated to be > 120 min

- **Goal:** Door to Needle < 30 minutes followed by immediate transfer to Closest PCI hospital

**Absolute Contraindications for Fibrinolysis (TNK) in STEMI:**

1. Any prior intracranial hemorrhage
2. Known structural cerebral vascular lesion (e.g., arteriovenous malformation)
3. Known malignant intracranial neoplasm (primary or metastatic)
4. Ischemic stroke within 3 months EXCEPT acute ischemic stroke within 3 hours
5. Suspected aortic dissection
6. Active bleeding or bleeding diathesis (excluding menses)
7. Significant closed-head or facial trauma within 3 months
8. Current use of oral anticoagulants (Warfarin, Dabigatran, Rivaroxaban, Apixaban, etc.)

**Relative Contraindications for Fibrinolysis (TNK) in STEMI:**

1. History of chronic severe, poorly controlled hypertension
2. Severe uncontrolled hypertension on presentation (SBP more than 180 mm Hg or DBP more than 110 mm Hg)
3. History of prior ischemic stroke more than 3 months, dementia, or known intracranial pathology not covered in contraindications
4. Traumatic or prolonged CPR (over 10 minutes)
5. Major surgery (within last 3 weeks)
6. Recent internal bleeding (within last 2-4 weeks)
7. Noncompressible vascular punctures
8. For streptokinase/anistreplase: prior exposure (more than 5 days ago) or prior allergic reaction to these agents
9. Pregnancy
10. Active peptic ulcer

If Patient is contraindicated for Fibrinolysis, Follow Transport Guidelines for Primary PCI
Improving the System of Care for STEMI Patients

2016 STEMI GUIDELINE Top - Page 2 of 2

**PRIMARY PCI Pathway – FMC to PCI less than 120 minutes – ACTIVATE CATH LAB (continued)**

Goal: Door-in to Door-out in < 30 minutes

- Establish large bore IV with NS @TKO, left arm preferred
- Heparin IV Drip (15 Units/kg/hr - max 1,000 units/hr)
- Obtain Labs: cardiac markers (CKMB, Trop I), CBC, BMP, PT/INR, PTT, and pregnancy serum if childbearing age (do not delay transport waiting for results)
- NTG 0.4mg SL every 5 min or Nitropaste PRN for chest pain (hold for SBP < 90)
- Analgesia (Morphine sulfate or Fentanyl) IV PRN for pain
- Consider Metoprolol (Lopressor) if patient hypertensive (>160/90).
  -50 mg PO or;
  -5mg IV x 1
  May consider additional doses if clinically indicated. Hold if SBP < 120, Pulse ox < 92%, HR < 60 or active CHF or Asthma
- Atorvastatin (Liptor) 80 mg PO

**FIBRINOLYSIS Pathway - FMC to PCI anticipated to be > 120 min (continued)**

Goal: Door to Needle < 30 minutes

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<table>
<thead>
<tr>
<th>Tenecteplase (TNKase) IV over 5 seconds:</th>
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<tbody>
<tr>
<td><strong>Patient Weight</strong></td>
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<tr>
<td>---------------------</td>
</tr>
<tr>
<td>kg</td>
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<tr>
<td>&lt;60</td>
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<tr>
<td>60 to &lt;70</td>
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<tr>
<td>70 to &lt;80</td>
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<tr>
<td>80 to &lt;90</td>
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<tr>
<td>≥90</td>
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</tbody>
</table>

- Unfractionated Heparin (UFH):
  - Heparin IV Bolus (60 Units/kg, max 4,000 Units)
  - Heparin IV Drip (12 Units/kg/hr, max 1,000 Units/hr)

**Optional to Heparin:**

- Enoxaparin (Lovenox):
  - Age < 75: 30mg IV plus 1 mg/kg SC (max 100mg)
  - Age > 75: No bolus. 0.75 mg/kg SC (max 75mg)
## Do not give Fibrinolytics (TNKase, rPA, or TPA) for Primary PCI Patients

<table>
<thead>
<tr>
<th>Location</th>
<th>Hospital Name</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bellevue, NE</td>
<td>Bellevue Nebraska Medicine</td>
<td>402-546-2675</td>
</tr>
<tr>
<td>Cheyenne, WY</td>
<td>Cheyenne Regional Medical Center</td>
<td>307-633-2203</td>
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<tr>
<td>Council Bluffs, IA</td>
<td>CHI Health Alegent Mercy</td>
<td>844-577-0577</td>
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<tr>
<td>Grand Island, NE</td>
<td>CHI Health St. Francis Medical Center</td>
<td>308-398-5560</td>
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<tr>
<td>Kearney, NE</td>
<td>CHI Health Good Samaritan</td>
<td>800-474-7911</td>
</tr>
<tr>
<td>Kearney, NE</td>
<td>Kearney Regional Medical Center</td>
<td>844-367-5762</td>
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<tr>
<td>Lincoln, NE</td>
<td>Bryan Medical Center</td>
<td>402-481-1111</td>
</tr>
<tr>
<td>Lincoln, NE</td>
<td>CHI Health - Nebraska Heart Institute</td>
<td>800-644-9627</td>
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<tr>
<td>Lincoln, NE</td>
<td>CHI Health St. Elizabeth</td>
<td>800-644-9627</td>
</tr>
<tr>
<td>Loveland, CO</td>
<td>Medical Center of the Rockies (MCR)</td>
<td>888-853-4900</td>
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<tr>
<td>Norfolk, NE</td>
<td>Faith Regional Health Services</td>
<td>402-371-4880</td>
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<tr>
<td>North Platte, NE</td>
<td>Great Plains Health</td>
<td>308-568-8760</td>
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<tr>
<td>Omaha, NE</td>
<td>CHI Health Immanuel Bergan Mercy</td>
<td>844-577-0577</td>
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<tr>
<td>Omaha, NE</td>
<td>Methodist Hospital</td>
<td>402-354-3444</td>
</tr>
<tr>
<td>Omaha, NE</td>
<td>Nebraska Medicine</td>
<td>402-763-3045</td>
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<tr>
<td>Papillion, NE</td>
<td>CHI Health Midlands</td>
<td>844-577-0577</td>
</tr>
<tr>
<td>Rapid City, SD</td>
<td>Rapid City Regional Hospital</td>
<td>605-755-8222</td>
</tr>
<tr>
<td>Sioux City, IA</td>
<td>Mercy Medical Center</td>
<td>712-560-6529</td>
</tr>
<tr>
<td>Sioux City, IA</td>
<td>Unity Point Health St. Luke’s</td>
<td>712-635-2022</td>
</tr>
</tbody>
</table>

- ♦ Titrated oxygen (starting at 2L/min) to maintain SpO2 between 90%-94%
- ♦ Aspirin 324 mg PO chewable times 1 dose (if not already given)
  - Clopidogrel (Plavix)
    - age ≤75: 300 mg loading dose
    - age >75: only 75 mg total
- ♦ Repeat EKG 30 minutes after fibrinolytics administration if possible

**Transport to Closest PCI Hospital Immediately**
PCI is everyone’s GOAL!
Improving the System of Care for STEMI Patients

Time is Muscle...So Times Are Important!

If ECG is transmitted from the field (EMS) and a STEMI is identified, the following should be done prior to patient arrival:

- Alert on-call provider if not in-house
- Activate Transferring agency (Air or Ground)
- Notify Receiving PCI Hospital Emergency Dept. Physician
- If Arrived by EMS, Leave Patient on Ambulance Cot

1st ECG time goal: 10 minutes from patient arrival

**PRIMARY PCI Pathway – FMC to PCI less than 120 minutes – ACTIVATE CATH LAB**

Goal: Door-in to Door-out in < 30 minutes

**FIBRINOLYSIS Pathway - FMC to PCI anticipated to be > 120 min (continued)**

Goal: Door to Needle < 30 minutes
Dr. David Cornutt

- Mission: Lifeline - Chair since 2014
- Presents on Mission: Lifeline and STEMI Guidelines
- Completed Outreach education to Critical Access Hospitals
- Works with EMS Advisory for Transport Guideline Review and 2016 update
- Works with EMS Medical Direction
Recommendations

• Perform a 12-Lead ECG by medical personnel at the site of first medical contact in patients with symptoms of STEMI

• ECG equipment & personnel to be dispatched to allow for 12-Lead ECG within a total scene time of less or equal to 15-minutes

• Patient to stay on ambulance stretcher for STEMI evaluation for hospitals that routinely transfer all or some patients by same ambulance
“A greater than 50% reduction in mortality with pre-hospital activation of the cath lab during STEMI Care”
Nebraska Mission: Lifeline EMS STEMI Guideline #1

Statewide guideline approved by the EMS Advisory Committee, Hospital Advisory Committee and Task Force

Defines who should receive a 12-Lead

**ALS and BLS - Obtain 12 L ECG with Initial Vital Signs**

Goal: First Medical Contact (FMC) to ECG ≤ 10 min, Scene time: ≤ 15 minutes *to provide early identification and pre-hospital arrival notification for suspected myocardial infarction or STEMI.*

- Chest pain, pressure, tightness or persistent discomfort above the waist in pts. ≥ 35 yrs. of age
- "Heartburn" or epigastric pain
- Complaints of “heart racing” (HR >150 or irregular and >120) or “heart too slow” (HR < 50 and symptomatic)
- A syncopal episode, severe weakness, or unexplained fatigue
- New onset stroke symptoms (< 24 hours old)
- Difficulty breathing or shortness of breath (with no obvious non-cardiac cause)
- ROSC (return of spontaneous circulation) post cardiac arrest
- Recent Cocaine, stimulant and/or other illicit drug use (pts. of any age)
- *If initial ECG is not diagnostic but suspicion is high for MI and symptoms persist, obtain serial ECG’s at 5-10 minute intervals*
Nebraska Mission: Lifeline EMS STEMI Guideline #2

- When should we call a “STEMI Alert”
- 3 options, call alert when any of the three are met
- Work with your medical director and local hospitals for feedback
- Some over-triage is expected and appropriate

**PRE-HOSPITAL STEMI ALERT Activation Criteria:**

**Goal:** Identify STEMI, Alert receiving facility - do not delay transport. Activate STEMI Alert when any one of the following criteria met & signs & symptoms suspect of (AMI) acute myocardial infarction including chest discomfort as described below are demonstrated with a duration of >15 minutes <24 hours

**BLS –**
- Transmit 12 Lead ECG and obtain interpretation by hospital staff or other qualified ALS personnel
- Alert hospital staff or qualified ALS personnel if ECG Monitor interpretive statement infers: “Acute Myocardial Infarction” and patient has signs & symptoms suspect of acute myocardial infarction including chest discomfort and symptoms listed above

**ALS –**
- 12 L ECG trained ALS EMS recognize ST segment elevation of ≥ 1 mm in 2 contiguous leads
- Confirmed Interpretation of STEMI transmitted and reviewed by a Practitioner (Physician, NP, PA)
- ECG Monitor interpretive statement infers: “Acute Myocardial Infarction” with signs & symptoms suspect of acute myocardial infarction including chest discomfort and symptoms listed above
- ACI-TIPI score of 75 or greater
Nebraska Mission: Lifeline EMS STEMI Guideline #3

Determine Transport Destination

- If FMC to PCI can be achieved in <90 minutes, arrange for ALS (air or ground) intercept and transport directly to PCI Capable Receiving Hospital for Primary PCI
- Activate STEMI Alert, transmit 12 L ECG as able, provide report to receiving hospital

- If FMC to PCI is > 90 minutes, transport to the closest appropriate non-PCI capable referring hospital for possible fibrinolytic therapy and urgent transfer to a PCI capable Receiving Facility for reperfusion
- Activate STEMI Alert, transmit 12 L ECG as able, provide report to receiving hospital

Diversion Criteria:
If patient demonstrates instability and/or has any one of the following Diversion Criteria requiring ED evaluation by a practitioner proceed to closest appropriate hospital:

- Possible need of head CT or neurological intervention / Confusion
- Emergent intubation Immediate circulatory stabilization
- Chest trauma or MVC victims
- Consider DNR Status
- Consider scoring with Sgarbossa Criteria

EMS services should be empowered to make these choices
Nebraska Mission: Lifeline EMS STEMI Guideline #4

• Top section – recommended ALS & BLS Treatment
• Bottom section – recommend ALS only guidelines

BLS & ALS
- Administer O2 starting at 2 L/Min per nasal cannula, titrate as needed to maintain SpO2 > 92%
- Obtain Systolic/Diastolic blood pressure (BP) in both arms
- Administer Chewable Aspirin 324 mg by mouth or rectally
- Administer Nitroglycerin Sublingual 0.4 mg every 5 minutes up to 3 doses if chest discomfort present and SBP > 100. Check BP prior to each administering dose. Hold if SBP < 100 mm HG (Note: BLS providers are only able to assist patients with self-administration of their own prescribed sublingual nitroglycerin)
- Evaluate if Erectile Dysfunction or Pulmonary hypertension medications taken in the past 24 hours including: Sildenafil (Viagra, Revatio), Vardenafil (Levitra, Staxyn), or Avanafil (Stendra), Tadalafil (Cialis, Adcirca). Hold nitrates for 48 hours following the last dose
- BLS only: Request ALS Intercept per local protocol
- Establish large bore IV (L) upper extremity preferred) access per protocol – Normal Saline 500ml KVO
  Establish a 2nd IV line as time allows

ALS
- Clopidogrel (Plavix) 300 mg by mouth if transferring for PPCI after confirmation by PCI Receiving Facility and local medical control per protocol
- Establish a Nitroglycerine IV Drip (if appropriate) if chest discomfort is unrelieved. Delivered via pump only, initiate @ 5 mcg/min & titrate in increments of 5mcg/min to maintain a systolic BP of 100 mm/Hg or greater. Hold nitrates as indicated
- Administer Analgesia as needed for discomfort per protocol
Nebraska Mission: Lifeline EMS STEMI Guideline #5

- Documentation is key to determining treatment for STEMI patients. Hospitals need this information ASAP.
- STEMI patients are very time-critical. Goals should be kept in mind at all times to reduce total time from onset to definitive treatment

**Documentation Reminders:**
- Provide Copy of eNARSIS report with verbal report to RN or MD
- If STEMI/AMI alert is requested of the receiving hospital, document the time
- Provide a Printed or Electronic Copy of Pre-Hospital 12 L ECG with Report to RN or MD

**Patient Care Goals:**
- Provide early identification of patients and early notification of the hospital for suspected AMI or STEMI
- Utilize an assessment tool that may reduce the time from onset of symptoms to receiving definitive cardiac interventions at the receiving hospital
- Prepare patient for immediate transport with indicated medications administered en route to hospital. Attempt to limit the scene time to the shortest time possible
Nebraska Mission: Lifeline EMS STEMI Guideline #6

- NE Mission: Lifeline goals will result in better outcomes for STEMI Patients
- Our statewide data collection tool will look at the reporting measures to determine where more effort and education is needed

AHA Mission: Lifeline EMS Best Practice Goals

1. All patients with non-traumatic chest discomfort, ≥ 35 yrs. of age, treated and transported by EMS receive a pre-hospital 12-lead electrocardiogram
2. All STEMI patients transported directly to a STEMI receiving center, receive a first (pre-hospital) medical contact to PCI time ≤ 90 minutes directly or ≤120 minutes for Interfacility hospital transfers
3. All lytic eligible STEMI patients treated and transported to a referring hospital for fibrinolytic therapy receive a door to needle time ≤ 30 minutes

AHA Mission: Lifeline EMS Reporting Measures:

1. Time from symptom onset to EMS dispatch
2. Time from dispatch to EMS vehicle arrival at receiving or referring hospital door
3. Number of suspected AMI/STEMI patients treated and transported by EMS who receive a 12-lead ECG
4. Number of STEMI patients treated and transported to a referring hospital for potential reperfusion by fibrinolysis therapy who receive a Fibrinolytic Checklist Screening enroute to identify possible contraindications
5. Number of STEMI patients who received a pre-hospital ECG, recognized STEMI, and called for a STEMI Alert at the receiving or referring hospital prior to arrival
In an acute STEMI patient, it may take time for this to be seen on an ECG. If clinical suspicion is high, despite transmission of a negative ECG for STEMI, medical oversight may request that you obtain and transmit additional tracings every 10 minutes.
It is vital that you maintain your equipment and your knowledge of how to use it. Frequent practice in acquiring and transmitting ECGs is encouraged.

Work with your local and PCI hospitals on transmission and receiving of test ECGs

Plan a Code STEMI Drill in your community
What more can EMS do to impact cardiac patient outcome?
The Ideal EMS

In an ideal system:

- Ambulances are equipped with 12-lead ECG machines
- EMS providers are trained to:
  - Use and transmit 12-lead ECGs
  - Care for STEMI patients
  - Provide feedback on performance and compliance with guidelines
- Standardized point-of-entry (POE) protocols define patient transport rules
- When there is STEMI, the cath lab is activated promptly
- Patients transported to a STEMI-referral hospital remain on the stretcher with EMS present pending a transport decision
- When “walk-in” patients present to a STEMI-referral hospital and require primary PCI, activation of EMS occurs
- Hospitals close the communication gap with EMS
Improving the System of Care for STEMI Patients

**GOALS**

- **Onset of symptoms of STEMI**
- **9-1-1 EMS dispatch**
- **EMS on-scene**
  - Encourage 12-lead ECGs
  - Consider prehospital fibrinolytic if capable and EMS-to-needle within 30 min

**EMS Transport**

- Prehospital fibrinolysis: EMS-to-needle within 30 min
- Hospital fibrinolysis: Door-to-needle within 30 min

**EMS Transport**

- EMS-to-balloon within 90 min
- Patient self-transport: Hospital door-to-balloon within 90 min

**Total ischemic time**: Within 120 min*

*Golden Hour = First 60 minutes*
Coordinated Actions that have occurred in Nebraska

- Assess and improve the EMS system
- Evaluate existing STEMI system models
- Establish local initiatives
- Launch Mission: Lifeline awareness campaigns
- Create system resources
- Engage strategic alliances
Improving the System of Care for STEMI Patients

What happens here potentially begins with **YOU!**
**STEMI Recognition** - Once identified it MUST trigger a clear response Downstream.

- Rapid Recognition of STEMI on ECG will only improve the process “IF” recognition leads to a concrete action downstream.

- Recognition allows early Reperfusion...but it does not guarantee it.

- A System of care is needed to navigate the rapids and have a successful outcome for patients.