Almost 250,000 Americans experience STEMI, the deadliest form of heart attack, each year.

30% STEMI patients fail to receive percutaneous coronary intervention (PCI) or thrombolytic therapy.

Of those who receive PCI, only 40% are treated within the door-to-balloon timeframe of 90 minutes, recommended by the American Heart Association.

Of those who receive thrombolytic therapy, fewer than the half are treated within the recommended door-to-needle timeframe of 30 minutes.

70% of those patients who aren’t eligible for thrombolytic therapy fail to receive PCI, the only other option to restore blood flow to blocked arteries.

STEMI SYSTEMS OF CARE
By working together, we can remove the barriers that stand between STEMI patients and prompt, appropriate care.
Point Of Entry Protocol : GOAL

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

Golden Hour = First 60 minutes

Patient
5 min after symptom onset
Dispatch
1 min
EMS on scene
within 8 min
EMS transport

EMS Triage Plan

Inter-hospital transfer

STEMI-referral hospital (non PCI-capable)

Electrocardiogram

STEMI-receiving hospital (PCI-capable)

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

Less than 90 Minutes

Improving the System of Care for STEMI Patients

* Golden Hour = First 60 minutes
ND STEMI Statistics

• In ND 43% of adults have 3 or more risk factors for Cardiovascular disease.

• CV disease is the #1 leading cause of death in ND.
Improving Rural STEMI Care through Multi-State Sharing and Collaboration

Jeffrey Sather, MD Timmy Health, Tomasz Goya, MD Sanford Health, Richard Mullain, RN, BDCH, ECPH Essentia Health, Gary Myers, MS, NREMT, Mindy Cook, RN, BSN, Pam Noe, RN, CPHQ, Michelle Gardner, MBA, American Heart Association, Midwest Affiliate

Background

Several factors can impede the timely delivery of timely care to STEMI patients, particularly in rural states such as South Dakota, North Dakota, and Minnesota. South Dakota has 66 counties covering nearly 18,000 square miles. Five of the seven perenniavous coronary interventional PCI-capable facilities are located in two communities and travel distances between hospitals can exceed 200 miles. North Dakota consists of 53 counties over 59,001 square miles. Thirty-five entire counties are designated medically underserved areas and 19 counties have some part of their designations medically underserved. Similar distances issues between referral hospitals and PCI-capable facilities are also seen in the majority of the state of Minnesota. These rural areas are heavily dependent upon volunteer ambulance services and the capabilities of the small local hospitals or care hospitals to receive the STEMI patient and transfer in a timely manner. Excluding the Twin Cities and Rochester, there are a total of 18 PCI-capable hospitals throughout rural Minnesota, South Dakota, and North Dakota. Only ten of these hospitals are chest pain centers, with one having Full Accreditation. There are 193 Critical Access Hospitals in this region, making them unusual to a STEMI system in care.

Methods

Mission: Lifeline is a strategic initiative to save lives and reduce disability by improving emergency readiness and response to STEMI patients, with funding support from the American Heart Association. Hospital, crime and state stakeholders have worked together to improve each component of the STEMI system, including access state providers. The South Dakota project started in 2010 followed by North Dakota in 2011. Minnesota was launched in 2013. In south state, 7 PCI-capable centers and 31 other specific sub-committees were formed. Each PCI-capable hospital was tasked to participate in data collection through ACTION Registry–GWTG™. EMS agencies in North Dakota and South Dakota were granted trust to participate in our mission. Minnesota is currently in the process of allocating these devices, based on funding availability. Critical Access Hospitals and other non-PCI-capable facilities participated in STEMI education which included ways to improve time critical processes and transfer protocols. An education plan was developed to invite agendas South Dakota and North Dakota as well, and this plan is being adjusted to treat the needs in Minnesota.

Results

A standard STEMI protocol was adopted in 2012 in North Dakota. South Dakota used this to create their own guideline which was adopted in 2012. Both protocols were shared with the Minnesota task force in 2014 by the South Dakota and North Dakota physical champions. The number of 11-lead ECG transmissions has more than tripled in South Dakota since the start of the project. In addition the time from First Medical Contact (FMCl) to PCI was 77 minutes in South Dakota from Oct 2012-Oct 2013 leading to the national average of 95 minutes. North Dakota is also exceeding the national average with a FMCl to PCI time of 61 minutes during that same time.

Conclusions

Although each state is very different, rural areas often have many of the same barriers for an effective STEMI system. As the projects have moved forward, each state has approach each component with a strategy and data-driven action plan based on needs. The learning experience across state borders has been effective to make progress. The hospitals data and 12-lead ECG transmission increase has proven that there is better STEMI system awareness and compliance throughout the states resulting in a better time from first medical contact to device. The collaboration of EMS and hospitals around state borders will help with the sustainability of the project and most effective way, the ability for better outcomes for STEMI patients, regardless of their location.

Limitations

Data was collected from ACTION Registry–GWTG™, which is the registry used by all PCI-capable hospitals in SD, MN and ND. The first medical contact results captures patients that have presented directly to a PCI-capable hospital via EMS or by walk-in. Transfers from other acute facilities are not included in this data. The ECG Transmissions were provided by Livewire and includes the majority or transmissions.
North Dakota Mission Lifeline
Regional Report Qtr.4, 2012-2013
**STEMI Diagnosis**

<table>
<thead>
<tr>
<th>ND State</th>
<th>Nation</th>
</tr>
</thead>
<tbody>
<tr>
<td>First ECG obtained Pre-Hospital (EMS Arr.) Direct</td>
<td>89%</td>
</tr>
<tr>
<td>Transfer</td>
<td>51%</td>
</tr>
<tr>
<td>STEMI Noted on first ECG Direct</td>
<td>87%</td>
</tr>
<tr>
<td>Transfer</td>
<td>90%</td>
</tr>
</tbody>
</table>

**Median Time from Symptom Onset (all)**

- To First Medical Contact (mins) | 44.0 | 49.0 |
- To Arrival via POV (mins) | 69.0 | 116.0 |

**Baseline Q3 2012**

- To First Medical Contact (mins) | 90.0 | 51.0 |
- To Arrival via POV2 (mins) | 62.5 | 115.0 |
## Mode of Arrival (to first facility)

<table>
<thead>
<tr>
<th>Mode</th>
<th>ND State</th>
<th>Nation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Vehicle - Direct</td>
<td>50%</td>
<td>36%</td>
</tr>
<tr>
<td>- Transfer</td>
<td>73%</td>
<td>74%</td>
</tr>
<tr>
<td>EMS - Direct</td>
<td>49%</td>
<td>61%</td>
</tr>
<tr>
<td>- Transfer</td>
<td>27%</td>
<td>26%</td>
</tr>
</tbody>
</table>

### Baseline Q3 2012

Mode of Arrival (to First Facility)

<table>
<thead>
<tr>
<th>Mode</th>
<th>ND State</th>
<th>Nation</th>
</tr>
</thead>
<tbody>
<tr>
<td>POV Direct</td>
<td>64%</td>
<td>37%</td>
</tr>
<tr>
<td>- Transfer</td>
<td>68%</td>
<td>71%</td>
</tr>
<tr>
<td>EMS (Ambulance) Direct</td>
<td>35%</td>
<td>60%</td>
</tr>
<tr>
<td>- Transfer</td>
<td>32%</td>
<td>28%</td>
</tr>
</tbody>
</table>
## Median Time to Reperfusion

<table>
<thead>
<tr>
<th></th>
<th>ND State</th>
<th>Nation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary PCI – Direct Presentation in minutes</td>
<td>48</td>
<td>56</td>
</tr>
<tr>
<td>- Transfer</td>
<td>131</td>
<td>106</td>
</tr>
<tr>
<td>Fibrinolysis Administration (Ref. Hosp.) minutes</td>
<td>35</td>
<td>31</td>
</tr>
</tbody>
</table>

## Reperfusion Method

<table>
<thead>
<tr>
<th></th>
<th>ND State</th>
<th>Nation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary PCI Overall</td>
<td>70%</td>
<td>85%</td>
</tr>
<tr>
<td>- Direct Presentation</td>
<td>94%</td>
<td>90%</td>
</tr>
<tr>
<td>- Transfers</td>
<td>51%</td>
<td>74%</td>
</tr>
<tr>
<td>Fibrinolytics Transfer</td>
<td>47%</td>
<td>18%</td>
</tr>
</tbody>
</table>
ND M:L EMS Transport Guideline

**North Dakota Mission: Lifeline EMS STEMI Transport Guideline**

**Obtain 12 L ECG withinitial Vital Signs:**
- Goal: First Medical contact to ECG ≤10 min. Some time ≤15 minutes
- Provide early Identification and Pre-hospital Alert notification for suspected myocardial Infarction or STEMI
  - Chest pain, pressure, tightness or persistent discomfort above the waist area in pta. ≤ 35 yrs. of age
  - "Heartburn" or epigastric pain
  - Complaints of "heart racing" (HR >100 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 hour old)
  - Difficultly breathing or shortness of breath (with or without non-cardiac cause)
  - ROSC (return of spontaneous circulation) post cardiac arrest
  - Recent Cocaine or illicit drug use

**P/I (Pre-Hospital) STEMI ALERT Activation Criteria:**
- “Goal: Identify STEMI Alert, receive facility, do not delay transport

  - Activate STEMI Alert when any one of the criteria met & signs & symptoms suspect of (AMI) acute myocardial infarction including chest discomfort as described with a duration of >15 minutes ≤4 hours
  - 12 L trained ALS EMS recognizes ST segment elevation ≥ 1 mm in 2 contiguous leads with
  - Confirmed Interpretation of STEMI by a Practitioner (Physician, NP, PA) by transmission
  - ECG Monitor interpretative statement reads: "Acute Myocardial Infarction" & signs & symptoms suspect of AMI involving chest discomfort

**Transport Criteria:**
- Transport time ≤ 75 minutes and total time from first medical contact (EMS at patient's side) to P/I (Percutaneous Coronary Intervention) PCI to PCI ≤ 120 minutes. Notify medical control and consider transport to the closest appropriate PCI-capable Referring Hospital for Primary PCI
- Transport time > 75 minutes and estimated time from first medical contact (EMS at patient's side) to P/I (Percutaneous Coronary Intervention) PCI to PCI ≤ 120 minutes. Notify medical control and consider transport directly to the closest appropriate non-PCI capable Referring Hospital for possible fibrinolysis therapy and urgent transfer to a PCI Capable Referring Hospital for Primary PCI

**Transport to Hospital Goal:**
- Transport to hospital within 120 minutes of receipt of STEMI Alert
- Transport to hospital within 75 minutes of receipt of STEMI Alert

**Transport Time:**
- Determine Transport Destination

**Documentation Reminders:**
- Provide Copy of BMS Run Sheet with Report to RN or MD
- If STEMI Alert is provided to the hospital, document the time
- Provide a Printed 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 an route to hospital. Attempt to limit the same time to the shortest time possible.

**AHA Mission: Lifeline EMS Best Practice Goals**
- All patients with non-traumatic chest pain, ≥ 30 years. treated and transported by EMS who get a pre-hospital 12-lead electrocardiogram
- All STEMI patients transported directly to a STEMI receiving center, with first (pre-hospital) medical contact to PCI ≤ 90 minutes directly or ≤ 120 minutes for transfer
- All lytic eligible STEMI patients treated and transported to a referring hospital for fibrinolytic therapy with a door to needle time ≤ 90 minutes

**AHA Mission: Lifeline EMS Reporting Measures**
- 1. Time from symptom onset to EMS dispatch
- 2. Time from EMS dispatch to vehicle arrival at hospital door
- 3. Time from EMS dispatch to vehicle arrival at hospital door
- 4. All STEMI patients treated and transported to a referring hospital for fibrinolytic therapy should have a Fibrinolytic Checklist completed to identify transfusion of lytic therapy
- 5. All suspected AMI/STEMI patients treated and transported by EMS should receive a 12-lead ECG
- 6. All STEMI patients with a pre-hospital identified STEMI call for field activation of a STEMI Alert at receiving hospital
Mission: Lifeline ND STEMI Inter-Hospital Transfer Guideline

**Guideline**

**AHA Mission: Lifeline Ideal STEMI Treatment Goals:**
- **First Medical Contact to Focused ECG time ≤ 10 minutes unless pre-hospital ECG obtained**
- **All eligible patients receiving any Reperfusion (PCI or fibrinolytic) therapy**
- **Fibrinolytic-eligible patients with Door-to-Needle time ≤ 30 minutes**
- **Reperfusion – entire patients transferred to a PCI receiving center within reperfusion time**
  - **Door In – Door Out time (Length of Stay) ≤ 45 minutes**
  - **Receiving Center ED Door to PCI Invasive time ≤ 120 minutes (includes transport time)**
- **All STEMI patients without a contraindication to aspirin before ED discharge**

**Patients with a contraindication to transfer or PCI:**
- Aspirin within 24 hours of hospital arrival, and aspirin at discharge
- Beta blocker at discharge
- LDL >100 who receive statins or lipid lowering drugs
- STEMI patients with left ventricular systolic dysfunction on ACE/ARB at discharge
- STEMI patients that smoke with smoking cessation counseling at discharge

**Upon Transfer Fax the following documents to the accepting facility:**
- 12 L ECG, ED Record, Lab Results, Current Medication Record, ND MI STEMI PUSH documentation
Improving the System of Care for STEMI Patients
6 STEMI Physician Champion’s sign on behalf of all 6 ND PCI Receiving
Learn Rapid STEMI ID

Thousands of patients with ST-Elevation Myocardial Infarction (STEMI) fail to receive critical therapy in a timely fashion, and nearly 30 percent of patients with STEMI do not receive any reperfusion treatment at all. To help address these issues, the American Heart Association has created a dynamic online program, Learn Rapid STEMI ID.

The self-directed, e-learning course prepares healthcare professionals to evaluate and assess victims with potential symptoms of myocardial infarction. Inpatient ECGs for signs of STEMI and advocate a system of care for rapid reperfusion of an occluded coronary artery.

Learn Rapid STEMI ID supports the efforts of the American Heart Association’s Mission: Lifeline, a national initiative to improve quality of care and outcomes in heart attack patients by improving healthcare systems’ readiness and response to STEMI patients.

Who benefits from this product?

This course is designed for any healthcare professional: EMSs, in-hospital providers who want to improve their STEMI recognition and assessment skills, or for healthcare professionals seeking to obtain continuing education credits.

Learn RSID keys still available through the ND M:L Grant

Free

4.6 contact hours!
Features

- Emphasizes immediate recognition and treatment of ACS STEMI
- Defines ACS and distinguishes STEMI from NSTEMI
- Mentions the importance of prompt treatment
- Includes self-assessment: Navigating the Leads, Recognizing the Heart, Measuring ST Deviation and Comparing Regional Changes
- Contains dynamic ECG loops to measure ST deviation
- Includes the STEMI Practice Exam and STEMI Competency Exam
- No skills session required
- Certificate of competency provided

Benefits

- Self-paced learning, accessible 24/7
- Improves awareness and need for healthcare system readiness and response to STEMI patients
- Close gaps in timely access
- Improves decision-making skills with accurate differentiation of 12-Lead ECG
- Improves appropriate patient triage and treatment
- Convenient alternative to traditional classroom training
- Access to course for 12 months, allowing for student/teacher update

Continuing Education Credits Available

- Continuing Education Accreditation — Nurses
  - This program (20501-78) has been approved by the American Nurses Credentialing Center (ANCC). The continuing nursing education activity was approved by the Emergency Nurses Association, an accredited approver by the American Nurses Credentialing Center’s Commission on Accreditation.

For more information on Learns: Rapid STEMI ID, visit OnlineAHA.org.
Importance is placed on immediately calling 911. Patient delay in reporting symptoms is one of the greatest obstacles to timely and successful care.

Toolkits available
Know.
Familiarize yourself with all the warning signs of a heart attack.
- Symptoms are not always severe—or limited to the typical chest pain you might expect.
- Chest discomfort or pain.
- Shortness of breath.
- Cold sweats.
- Upper body pain or discomfort.
- Nausea.
- Lightheadedness.
Not all of these signs occur in every heart attack. Sometimes they go away and return.

Act.
Dial 9-1-1 immediately at the first sign of a heart attack.
- A heart attack is a life or death emergency.
- Half of heart attack victims die within an hour of the first symptoms.
- Your heart can suffer permanent damage the longer you wait.
- 9-1-1 operators can provide instructions that can help save your life.

Live.
Don’t waste precious minutes driving yourself to the hospital.
- EMS will monitor and transmit vital signs to the hospital so they are ready when you arrive.
- Ambulances are equipped to start treatment immediately.
- Your chance of survival is much greater when you dial 9-1-1.
- If you drive, you could injure yourself or others if your symptoms worsen while driving.

Your life is on the line. Dial 9-1-1.
www.heart.org/NorthDakota
ND House Bill 1175 Acute Cardiovascular Emergency Medical System – Next Steps

Sixty-third Legislative Assembly of North Dakota
In Regular Session Commencing Tuesday, January 8, 2013

HOUSE BILL NO. 1175
(Representatives Porter, Slovenia, Nelson)
(Senators Carisie, Dever, O'Connell)

AN ACT to create and enact a new chapter to Title 33 of the North Dakota Century Code, relating to an acute cardiovascular emergency medical system.

BE IT ENACTED BY THE LEGISLATIVE ASSEMBLY OF NORTH DAKOTA:

SECTION 1. A new chapter to Title 33 of the North Dakota Century Code is created and enacted as follows:

Definitions.
As used in this chapter:
1. “Department” means the state department of health.
2. “STEM” means ST-elevation myocardial infarction.

Acute cardiovascular emergency medical system - duties of state department of health.
3. Following consultation with and receipt of a reorganization of the acute cardiovascular emergency medical system of care advisory committee, the department shall establish and maintain a comprehensive emergency cardiovascular medical system for the state. The system must include standards for the following components:
   a. System plan,
   b. Prehospital emergency medical services,
   c. Hospitals for which the standards must include:
      (1) Standards for designation, redesignation, and dedesignation of receiving and referring centers,
      (2) Standards for evaluation and quality improvement programs for designated centers,
      (3) Recognition of a hospital as a STEM receiving center or a STEM referring center in making such designation, the standards must include consideration of whether the hospital:
         (a) Accredited as a mission, having STEM receiving center or mission, having STEM referring center by the society of cardiovascular patient care and the American heart association accreditation process, or
         (b) Accredited by a department-approved, nationally recognized organization that provides mission, having STEM receiving center and mission, having STEM referring center, accreditation of a substantial milestone,
   d. System registries, for which the components must include a plan for achieving, maintaining quality improvement in the quality of care provided under the statewide system, including for STEM response and treatment.
Mission: Lifeline ND Regional EMS and Hospital Mini Conferences

Agenda:

11:00 Tips and Tricks to demystify 12L ECG Interpretation
   Travis Spier, RN, NR-Paramedic, CCEMT-P Mission: Lifeline SD

11:30 Regional STEMI Data Sharing
   Pam Moe Quality and System Improvement AHA MWA,
   Sandy Kovar STEMI Coordinator Altru Health System

12:00 – 12:30 Lunch (provided)

12:15 Establishing STEMI reperfusion therapy: Fibrinolytic Eligibility vs. Primary PCI
   Dr. Rabeea Aboufakher Cardiology Altru Health System

1:00 NE Regional Case Reviews
   Dr. Mikhail Kirnus Cardiology Altru Health System

1:45 ND M: L Project impact and visions for the future
   Mindy Cook Director Mission: Lifeline ND, MN

2:00 Adjourn
Upcoming Dates

• June 5 2014 **SE Region** 10:00 am-1:00 pm CST
  Sanford Health Auditorium Fargo, ND

• June 16 2014 **NW Region** 11:00 -2:00 CST
  Trinity Health Skyline Room Minot, ND

• June 30 2014 **SW Region** 11:00 – 2:00 CST
  St Alexius BTWAN Room Bismarck, ND
Save the Date

ND Mission: Lifeline STEMI and Acute Stroke Conference

**August 5, 2014 Stroke Focus**
1:00 p.m. – 5:30 p.m.

**August 6, 2014 STEMI Focus**
8:00 a.m. – 3:30 p.m.

**Stroke and STEMI Simulation Training**
Concurrent breakouts offered Aug 5-6
Provided by: SIM-ND

Ramada Plaza & Suites and Conference Center
1635 42nd Street South • Fargo, ND 58103
Reservations: (701) 277-9000

Mark Your Calendars Today!
Please send RSVP's to
Ngia.Mua@heart.org or 952-278-7934

Objectives:
- Share and discuss best practice models from across the state of North Dakota with reference to the AHA Mission: Lifeline STEMI and ND DOH Stroke Initiatives
- Identify opportunities to utilize pre-hospital STEMI and Stroke assessment to augment rural and urban hospital clinicians in diagnosing and triaging patients
- Identify opportunities to enhance collaboration and share knowledge from recognized STEMI and Stroke programs regionally and nationally to improve myocardial infarction and stroke outcomes through decreasing time to reperfusion or most appropriate treatment strategy

To provide a review of AHA/ACC/ASA science and recommendations for ideal STEMI and Stroke care for each type of health care agency involved in the chain of survival.

- Identify opportunities and strategies to utilize data collected and feedback mechanisms to improve STEMI and Stroke systems of care in ND
- To provide STEMI and Stroke scenario-based hands on training

Target Audience:
- Providers: Cardiologists, ED physicians, NP’s, PA’s
- Nurses, nursing leadership & administration
- EMS providers, leadership & medical directors
- All levels of health care providers interested in improving STEMI and Stroke Systems of Care in ND
Questions??

Mindy Cook, RN BSN
Director Mission: Lifeline North Dakota, Minnesota
American Heart Association, Midwest Affiliate

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Minneapolis, MN  55435
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Fax: 952.835.5828
E-mail: Mindy.Cook@heart.org

www.heart.org/NDMissionLifeline