# ACC State Chapters: How Can They Impact STEMI Systems Development?

James G. Jollis, MD, FACC

# ACC Chapters / STEMI systems

- The need for cardiology leadership
- Example in North Carolina
- Chapter activities across the U.S.

Leadership in the hospital



You Are Here: .: What is D2R2 » D2R Core Strategies :

# **Core Strategies**

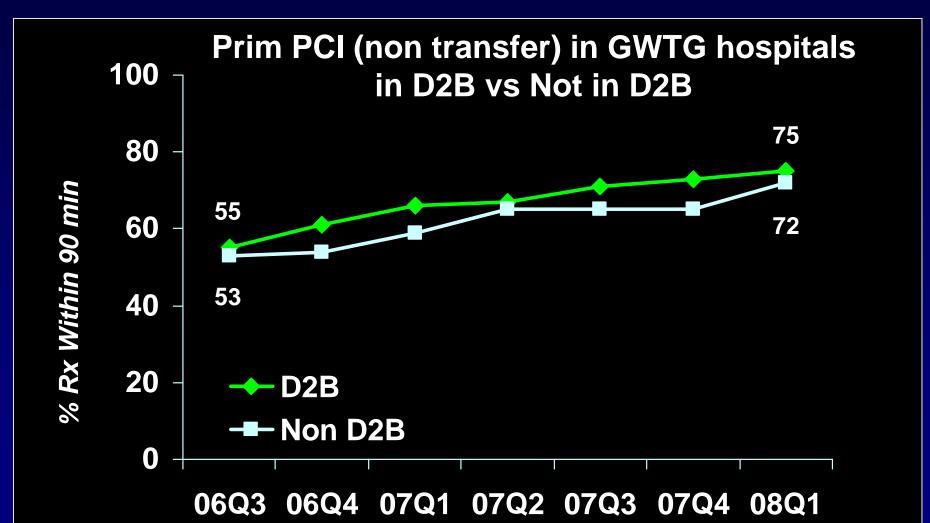
- 1. ED physician activates the cath lab;
- 2. One call activates the cath lab;
- 3. Cath lab team ready in 20 30 minutes;
- 4. Prompt data feedback;
- 5. Senior management commitment;
- 6. Team-based approach.
- Optional. EMS activates the cath lab.

A pre-hospital ECG to activate the cath lab is optional.
While other strategies exist, including having a cardiologist in the hospital 24/7, they are not required for participation in the D2B campaign.

http://www.d2balliance.org/



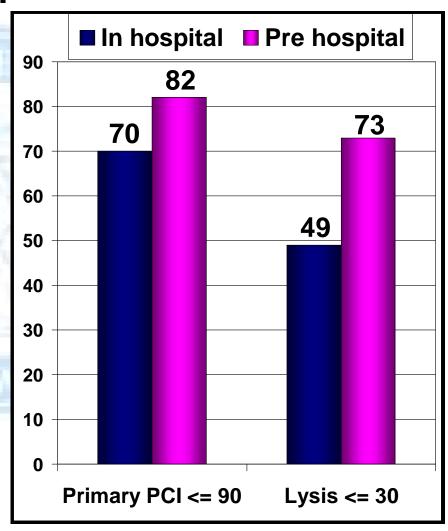
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- Leadership in the hospital
- Advancing pre-hospital care

# Pre-Hospital ECG

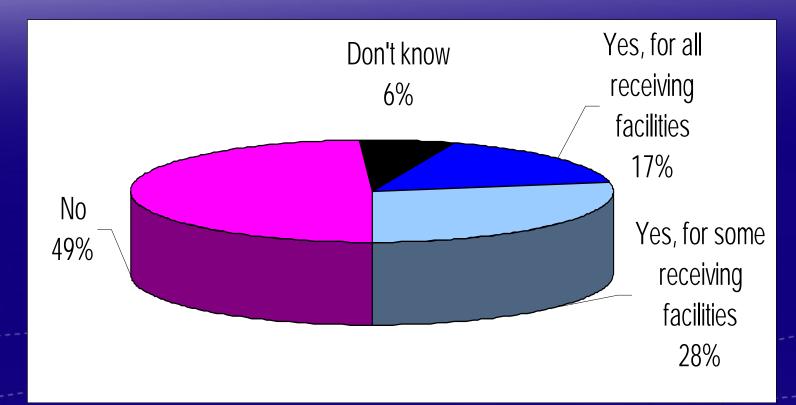
- ACTION registry 2007
- 1,941 of 7,098 EMS
   transported patients had
   pre-hospital ECG
- Trend for lower mortality
   0.85 (0.63-1.01)



% treated within goal

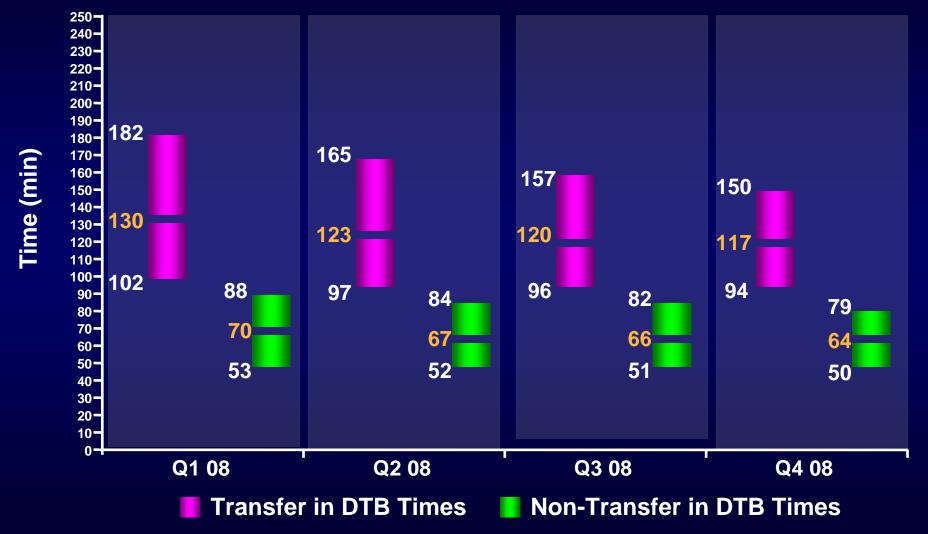


### 12 Lead Activates the Cath Lab



In your Agency/Organization, is the field provider's 12-lead ECG information used to activate the cath lab prior to arrival at the receiving facility?

# STEMI Door-to-Balloon Times — Median Times for Transfer In and Non-Transfer In Patients



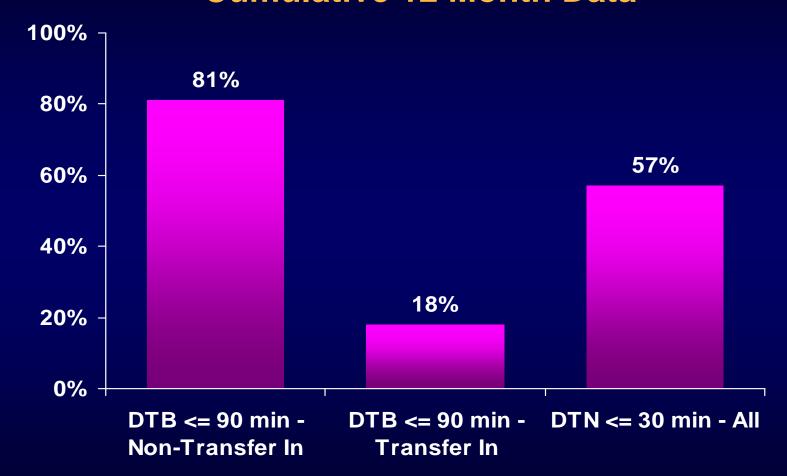






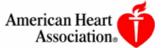


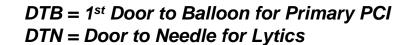
# STEMI – Door to Balloon and Door to Needle Times: Cumulative 12 Month Data



ACTION Registry-GWTG DATA: January 1 - December 31, 2008









- Leadership in the hospital D2B
- Advancing pre-hospital care
  - Enable and train EMS to activate cath. lab appropriately.
  - Establish protocols for rapid transfer of patients from outside hospitals.

- Leadership to overcome systematic barriers
  - Competition
  - Medical system gaps
    - Regional plans
    - Inter-hospital transfer
    - Fragmented EMS
    - Emergency department and EMS training

 With a focus on the patient and intimate knowledge of the medical system, cardiology has the unique ability to markedly improve STEMI care without the need for regulatory oversight or legislation.

# ACC Chapters / STEMI systems

- The need for cardiology leadership
- Example in North Carolina
- Chapter activities across the U.S.

- Interested Councilors and members form STEMI system leadership
  - Geographically disperse
  - Leaders in the interventional lab, hospital, and community
  - Appoint members from each closely competing hospital.

### Competition

### COMPETITION

Don't change referral lines

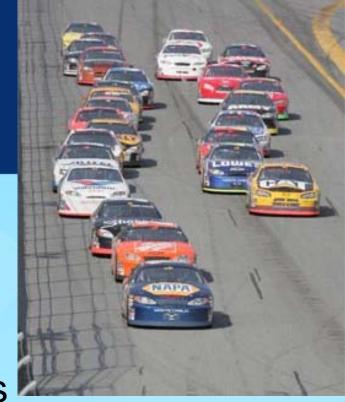
ED physicians, paramedics, and patients choose their hospitals

Everyone in the tent

Non-partisan

Avoided legislation

A few great leaders were key



### Organization



# Central Steering Committee and Statistics

- James Jollis, MD
- Chris Granger, MD
- Mayme Roettig, RN, MSN
- Kevin Anstrom, PhD

### Regional Coordinators

- Marla Jordan, RN
- Lourdes Lorenz, RN, MSN
- Lisa Monk, RN, MSN
- Mary Printz, RN, FNP-C
- Stephanie Starling-Edwards, RN
- Jenny Undewood, RN

#### Physician leaders

- Akinyele Aluko
- Robert Applegate
- Joseph Babb
- Peter Berger
- David Bohle
- Sidney Fletcher
- J. Lee Garvey
- Robert Hathaway
- James Hoekstra
- Robert Kelly
- William Maddox

# Physician leaders (continued)

- Joseph Shiber
- F. Scott Valeri
- Bradley Watling
- Hadley Wilson

### **Oversight Board**

- Robert M. Califf
- Pamela Douglas
- Robert Harris
- Greg Mears
- William O'Neill

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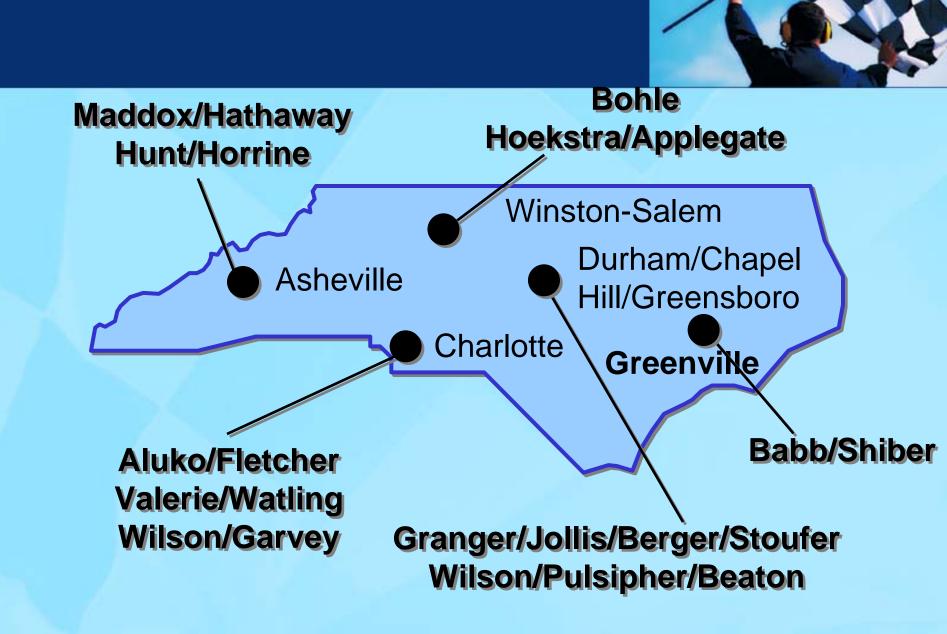
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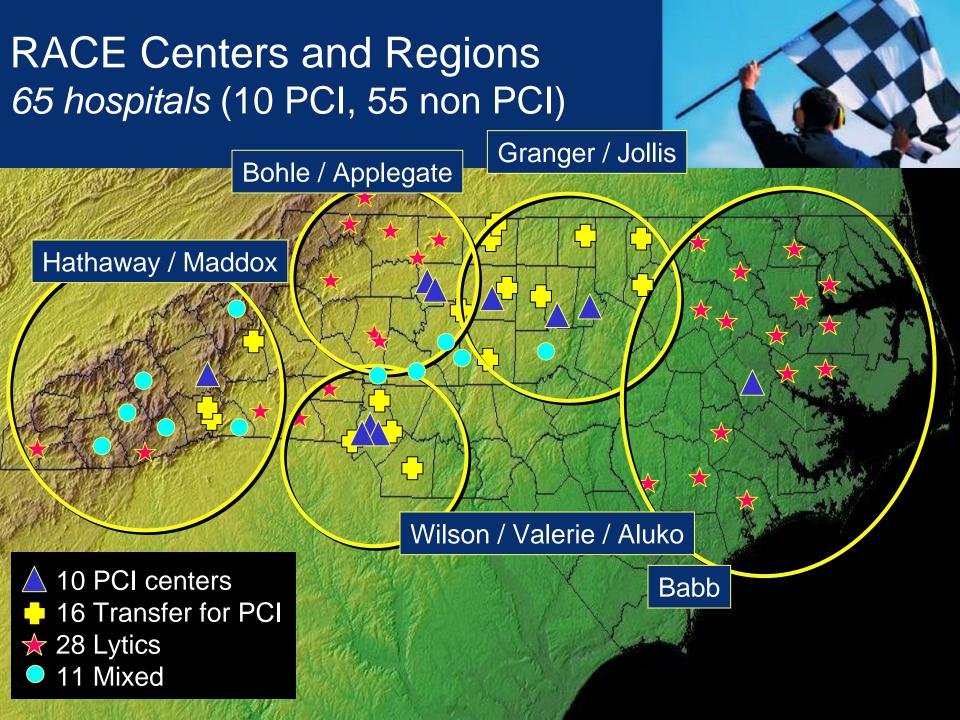
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Use Chapter website as STEMI system communication site

### nccacc.org









Reperfusion of Acute Myocardial Infarction in Carolina Emergency Departments (RACE) project is a collaborative effort to increase the rate and speed of coronary reperfusion through systemic changes in emergency care. The project is based upon the collaborative efforts of EMS personnel, physicians, nurses, administrators, and payers from five regions and 68 hospitals throughout North Carolina. The

recommendations of this project are based upon established guidelines, published data, and the knowledge and experience of numerous individuals specializing acute myocardial infarction care. Visit <a href="https://www.race-er.org">www.race-er.org</a> for more information.

#### North Carolina Interventional Summit: Focus on STEMI

June 2, 9:00am - 4:30pm Forysth Medical Conference Center 3333 Silas Creek Pkwy Winston-Salem, NC

A maximum of 6 AMA PRA category 1 CME credits have been designated for this educational activity. View the agenda

Click here for more information about RACE and to read the press releases.



#### Announcements

This Week at ACC

American Imaging
Management Clinical
Information Worksheet

NC / SC 16th Annual Joint Meeting September 11-13, 2009 Grove Park Inn Asheville, NC

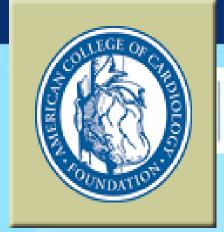
UHC: Premium Physician Designation Program

CIGNA Revises Modifier (-25 and -59) Policy

- Reach out to other professions / professional societies
  - emergency medicine / ACEP / SAEM
  - EMS / State / Medical directors / training directors
  - nursing / cath. lab supervisors / staff
  - hospital administrators
  - payers

### RACE Partners





















 Organize leadership and system meetings around Chapter activities / annual meetings.



- Publish a state "operations manual" for STEMI systems
  - Clinical trial evidence, guidelines, regional consensus.

# Establish a plan





### Single best plan per hospital



#### Regimen A - Primary PCI

Preferred if able to meet time goals

(To be used with institution specific standing orders/protocols for ST-elevation myocardial infarction patients)

#### ELIGIBLE PATIENTS

- Within 12 hours of symptom onset.
- ST-segment elevation in 2 or more contiguous leads >1mm or left bundle branch block.
- Primary angioplasty is also the best option for:
  - · Cardiogenic Shock; Killip class III or >.
  - Possible ST-elevation MI but uncertain of diagnosis.
  - · Contraindication to fibrinolysis.
  - Physician or patient preference.

Goal is to open artery with angioplasty balloon within 90 minutes of arrival to first hospital or first medical contact.

- · Emergency department physician makes the decision about need for primary angioplasty, if possible. Consultation should be limited to situations of uncertainty.
- · Notify PCI hospital of an ST-elevation MI in need of primary angioplasty.
- · Complete EMTALA form as a priority.
- Fax patient records including ECG to receiving hospital WHILE PATIENT IN TRANSFER.
- Continuous N infusions should only be used if required for stability during transfer.

#### OTHER MEDICATIONS

- Heparin: Bolus at 70 IU/kg IV bolus. No maintenance infusion during transfer.
- 2. Aspirin: 325 mg chewed.

#### PRN Medications:

- Nitroglycerin paste 1 to 2 inches topically PRN chest pain.
- Morphine Sulfate 2-10mg IV for chest pain unrelieved by Nitroglycerin PRN.

#### Reperfusion Regimen B - Fibrinolysis

(To be used with institution specific standing orders/protocols for ST-elevation myocardial infarction patients)

#### ELIGIBLE PATIENTS

- Within 12 hours of symptom onset.
- ST-segment elevation in 2 or more contiguous leads > 1mm or left bundle branch block.
   Absence of contraindications (see below).

FIBRINOLYTIC [tenecteplase (TNK) or reteplase (rPA)]

#### Tenecteplase (TNK) regimen Single IV bolus over 5 seconds

Use TNK dose chart at right to determine dose. 🛏 Patient weight Patient-specific dose (NOT TO EXCEED 50mg)

#### Reteplase (rPA) regimen

10 units IV over 2 minutes given twice at 30-minute intervals

<u>&gt;</u> 70 to < 80	40	8
<u>&gt;</u> 80 to < 90	45	9
≥ 90	50	10

TNK

(mg)

Volume

TNK to be

administered (ml)

7

Patient Weight

(kg)

< 60

≥ 60 to < 70

In nurses' notes and MAR, please note EXACT TIME of fibrinolytic administration, and obtain ECG 30 minutes after fibrinolytic administered.

#### OTHER MEDICATIONS:

- Heparin:

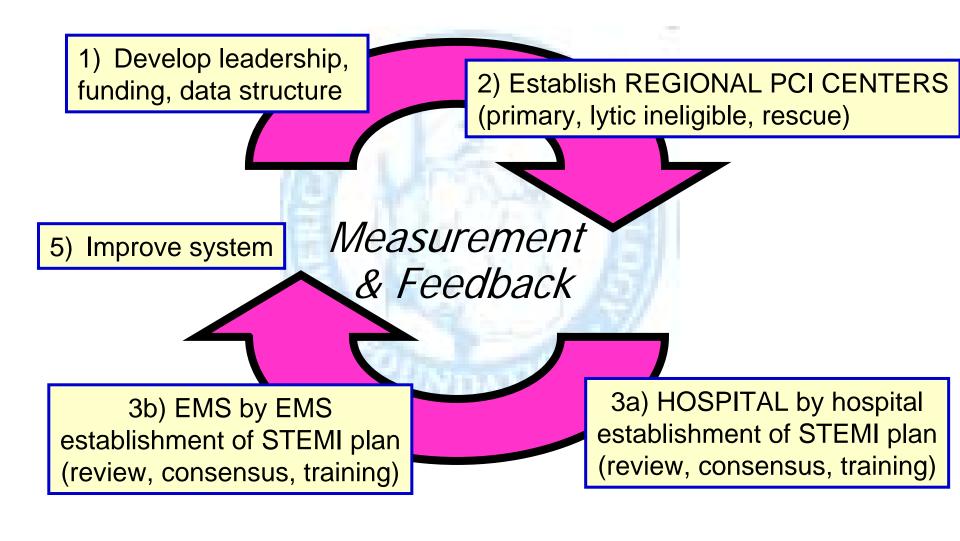
   Bolus at initiation of TNK or rPA 60 IU/kg IV bolus (maximum 4,000 IU).
   Maintenance 12 IU/kg/h (maximum 1,000 IU) to achieve activated partial thromboplastin time (APTT) 1.5 to 2 times control, maintained for 48 hrs.
- 2. Aspirin 325 mg chewed.

#### Absolute contraindications

- Any prior intracranial hemorrhage
   Known structural cerebral vascular lesion (for example arteriovenous malformation)
- □ Known malignant intracranial neoplasm (primary or metastatic)
   □ Ischemic stroke within 3 months EXCEPT acute ischemic stroke within 3 hours
- Suspected aortic dissection
   Active bleeding or bleeding diathesis (excluding menses)
   Significant closed head or facial trauma within 3 months

#### Relative contraindications

- History of chronic severe, poorly controlled hypertension
   Severe hypertension on presentation (systolic blood pressure greater than 180 mm Hg or diastolic blood pressure greater than 110 mm Hg)
   History of prior ischemic stroke greater than 3 months, dementia, or known intracranial pathology not
- covered in contraindications
- Traumatic or prolonged (greater than 10 minutes) CPR or major surgery (less than 3 weeks) Recent (within 2 to 4 weeks) internal bleeding
- Noncompressible vascular punctures



### RACE PRIMARY PCI Center\*



- 1. 24/7 PCI capability within 30 minutes
- 2. Single number activation (immediate)
- 3. Accept patients regardless of bed availability
- 4. Ongoing data monitoring and feedback (ACTION-GWTG, "cath lab activation" registry)
- STEMI Team with strong administrative support and dedicated STEMI coordinator
- Improve STEMI care for all hospitals in region regardless of affiliation

<sup>\*</sup> Must be fully operating to be a RACE regional PCI center

# RACE Interventions





### RACE Hospital - Non PCI\*



- 1. STEMI Team with strong administrative support
- Establish a single plan for STEMI reperfusion
- Periodic data collection and review by RACE regional coordinator

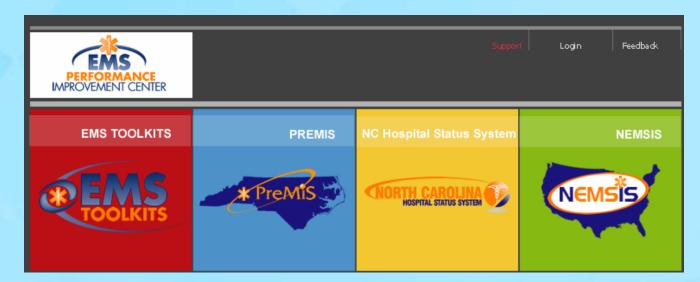
<sup>\*</sup> Must be in place to be a RACE hospital

# EMS Acute Cardiac Toolkit



### Established STEMI system quality standards:

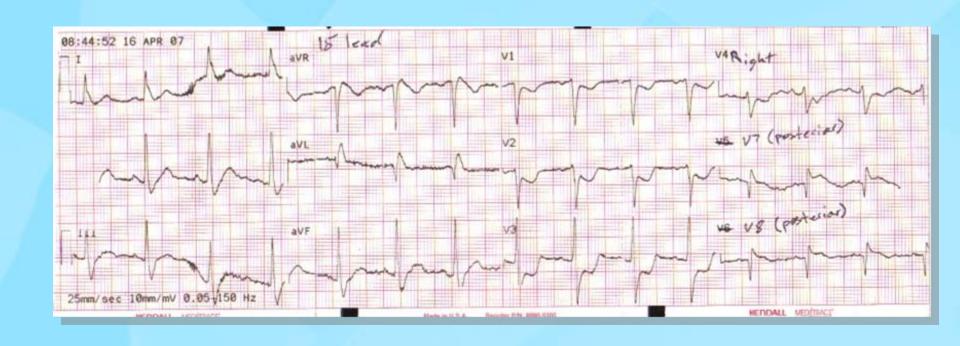
- 1) In the field ECG
- 2) Under 15 minute scene time
- 3) Hospital pre-notification
- 4) Standing STEMI plan / destination protocols



- Focus on EMS
  - ECG training
  - Direct feedback to EMS regarding reperfusion
    - Case reviews
    - Data sharing with EMS training director

# **ECG** training



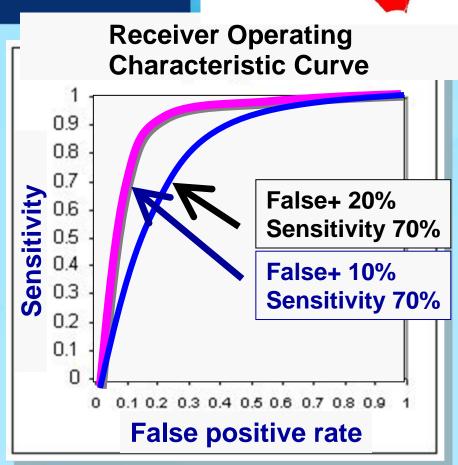


## ECG training / case review



IMPROVE ECG
PERFORMANCE

Fewer false activations
without missing
more STEMI's25



### How we established a STEMI system

Monitor regulatory / legislative activities.



# ACC Chapters / STEMI systems

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### Improving the System of Care for STEMI Patients



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- 1) Protocols for triage, diagnosis and Cardiac Catheterization Laboratory activation should be established within the primary PCI hospital/STEMI Receiving Center. A single activation phone call should alert the STEMI team. Criteria for EMS activation of the Cardiac Catheterization Laboratory should be established in conjunction with EMS offices.
- 2) The STEMI-Receiving Center should be available 24 hours/7 days a week to perform primary PCI.
- 3) The Cardiac Catheterization Laboratory staff including interventional cardiologist should arrive within 30 minutes of activation call.
- 4) There should be universal acceptance of STEMI patients (no diversion). There should be a plan for triage & treatment for simultaneous presentation of STEMI patients.
- 5) Interventional cardiologists should meet ACC/AHA criteria for competence. Interventional cardiologists should perform at least 11 primary PCI procedures per year and 75 total PCI procedures per year.

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- 6) The STEMI-Receiving Center should meet ACC/AHA criteria for volume and perform a minimum of 36 primary PCI procedures and 200 total PCI procedures annually.
- 7) The STEMI-Receiving Center should participate in the Mission: Lifeline-approved data collection tool, ACTION Registry GWTG.
- 8) A program should be in place to track and improve treatment (acutely & at discharge) with ACC/AHA guideline based Class I therapies.
- 9) There should be a recognized STEMI-Receiving Center liaison/system coordinator to the system and a recognized physician champion.



- 10) There should be monthly multidisciplinary team meetings to evaluate outcomes and quality improvement data. Operational issues should be reviewed, problems identified, and solutions implemented. The following measurements should be evaluated on an ongoing basis:
- a) Door-to-balloon (first device used) time, non-transfer within 90 minutes
- b) STEMI Referral Hospital ED door-to-balloon (first device used) time, transfer within 90 minutes
- c) First Medical contact to balloon inflation (first device used) non-transfer within 90 minutes
- d) First Medical contact to balloon inflation (first device used) transfer
- e) Proportion of eligible patients receiving reperfusion therapy
- f) Proportion of eligible patients administered guideline-based Class I therapies
- g) Proportion of patients with field diagnosis of STEMI and activation of the Cardiac Catheterization Laboratory for intended primary PCI that
- i) do not undergo acute catheterization because of misdiagnosis
- ii) undergo acute catheterization and found to have no elevation in cardiac biomarkers and no revascularization in the first 24 hours
- h) In hospital mortality

#### Non-PCI Hospital/ STEMI Referral Center

- 1) Appropriate protocols and standing orders should be in place for the identification of STEMI. At a minimum, these protocols should be present in the Intensive Care Unit/Coronary Care Unit and Emergency Department (ED)
- 2) Each ED should maintain a standardized reperfusion STEMI care pathway that designates primary PCI as the preferred reperfusion strategy if transfer of patients to a primary PCI hospital/STEMI-Receiving Center can be achieved within times consistent with ACC/AHA guidelines.
- 3) Each ED should maintain a standardized reperfusion STEMI care pathway that designates fibrinolysis in the ED (for eligible patients) when the system cannot achieve times consistent with ACC/AHA guidelines for primary PCI.
- 4) If reperfusion strategy is for primary PCI transfer, a streamlined, standardized protocol for rapid transfer and transport to a STEMI-Receiving Centershould be operational.

#### Non-PCI Hospital/ STEMI Referral Center

- 5) If reperfusion strategy is for primary PCI transfer, all patients should be transported to the most appropriate STEMI-Receiving Center where the expected first door-to-balloon (first device used) time should be within 90 minutes (considering ground versus air transport, weather, traffic).
- 6) The STEMI Referral Center should have an ongoing quality improvement process, including data measurement and feedback, for the STEMI population and collect and submit Mission: Lifeline required data elements (using the Mission: Lifeline Bridging form\*).
- 7) A program should be in place to track and improve treatment (acutely and at discharge) with ACC/AHA guideline based Class I therapies.
- 8) A multidisciplinary STEMI team, including EMS, should review hospital specific STEMI data on a quarterly basis.
  - a) Door-to-first ECG time (goal <10 minutes)
  - b) Proportion of STEMI-eligible patients receiving any reperfusion (PCI or fibrinolysis) therapy.
  - c) STEMI Referral Center ED door-to-balloon (first device used) time for patients transferred to PCI center
  - i) STEMI Referral Center ED door to ED discharges
  - ii) STEMI Referral Center ED door-to-balloon (first device used) time within 90 minutes (including transport time)



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- 1) Each EMS system should maintain a standardized algorithm for evaluation and treatment of patients with symptoms suggestive of myocardial ischemia that should include acquisition of a 12-lead ECG and appropriate communication of the ECG findings (via direct paramedic interpretation/voice communication, automated computer algorithm interpretation, wireless transmission and physician interpretation, or any combination of these three strategies) to the receiving hospital.
- 2) Each EMS system should maintain a standardized reperfusion STEMI care pathway that designates primary PCI as the preferred reperfusion strategy if initiated within 90 minutes of first medical contact or fibrinolytic therapy in eligible patients when primary PCI within 90 minutes is not possible.
- 3) Prearranged EMS destination protocols for STEMI patients should include:
- a) Bypassing non-PCI hospitals/STEMI Referral Centers and going directly to primary PCI hospitals/STEMI-Receiving Centers for patients with anticipated short transport interval (e.g. <30 minutes in urban/suburban settings, so as to achieve primary PCI within 90 minutes)
- b) Emergency transfer by EMS or other agencies to a STEMI-Receiving Center of patients with STEMI who transport themselves to a STEMI Referral Center.
- c) Air transport if possible (or default to ground transport) to STEMI-Receiving Center or stabilization in STEMI Referral Center for patients with anticipated long transport time and/or either fibrinolytic ineligible and/or in cardiogenic shock
- d) Administration of fibrinolytic therapy prehospital or in a STEMI Referral Center for fibrinolytic eligible patients with anticipated time to primary PCI exceeding 90 minutes
- e) Emergency transfer to a STEMI-Receiving Center of patients who develop STEMI while in hospital at STEMI Referral Center (non-PCI hospital).

- The second secon
- 4) When taken directly to a STEMI-Receiving Center, all STEMI patients should be transported to the most appropriate facility as determined by Mission: Lifeline hospital criteria, with a system goal of first medical contact to balloon inflation (initial device used) within 90 minutes.
- 5) EMS medical director or designate should monitor care related to EMS patients with STEMI by meeting at least quarterly with prehospital providers, emergency physicians, interventional cardiologists, nursing staff, receiving hospital representatives, and other appropriate individuals (i.e. STEMI Survivor).
- 6) The following measurements should be evaluated on an ongoing basis:
- a) Symptom onset to 911 call
- b) Time 911 call is first received by primary public safety answering point to vehicle arrival at hospital door
- c) Time from first medical contact to balloon inflation (first device used).
- d) Time from prehospital ECG to balloon inflation (first device used).
- e) Proportion of patients with non-traumatic chest pain > 35 years treated by EMS for whom 12-lead ECGs were obtained
- f) Proportion of patients with STEMI treated by EMS for whom 12-lead ECGs were obtained
- g) Proportion of patients with field diagnosis of STEMI and activation of the Cardiac Catheterization Laboratory for intended primary PCI that
- i) do not undergo acute catheterization because of misdiagnosis
- ii) undergo acute catheterization and found to have no elevation in cardiac biomarkers and no revascularization in the first 24 hours
- h) Proportion of patients with EMS treated ventricular fibrillation (VF) who are taken to the Cardiac Catheterization Laboratory
- i) Survival to hospital discharge of all STEMI patients and of patients with VF (EMS and STEMI-Receiving Center to monitor jointly)

### STEMI System

- 1) The System should be registered with Mission: Lifeline.
- 2) There should be on-going multidisciplinary team meetings that include EMS, non-PCI hospitals/STEMI Referral Centers, and PCI hospitals/STEMI Receiving Centers to evaluate outcomes and quality improvement data. Operational issues should be reviewed, problems identified, and solutions implemented.
- 3) Each STEMI System should include a process for pre-hospital identification and activation, destination protocols to STEMI Receiving Centers, and transfer for patients who arrive at STEMI Referral Centers and are primary PCI candidates, and/or are fibrinolytic ineligible and/or in cardiogenic shock.
- 4) Each system should have a recognized system coordinator, physician champion, and EMS medical director.
- 5) Each system component (EMS, STEMI Referral Centers and STEMI-Receiving Centers) should meet the appropriate criteria listed above.





#### ACC Chapters and AHA Mission: Lifeline STEMI Efforts 2009

This document captures information from ACC Chapter Presidents and Governors, Chapter Executives and ACC members and staff, and will be updated on a rolling basis as activities are reported.

#### HIGHLIGHTS

- Most Chapters reported difficulty in promoting the AHA Legislation to their lawmakers due to financial crisis.
- Many projects and meetings are scheduled already in 2009 to move MLL/STEMI efforts forward.

#### ALABAMA

Governor Michael B. Honan, M.D., FA.C.C. Dr. Piene Scalice, Esconancided SIFMI Champion.

- The Chapter leld a #IFIMI or generational meeting in Neumber 1008 and is presenting the Mission Lifeline at the Chapter Ameral Meeting June 4, 2009.
- The Ahbama Chapter has optid to initiate to gioralization of MI care in the Binninghom area in cooperation without our origing effort of the Binninghom he gioral Biner gamey Medical flowings is term (BERMES).
  - This is a volunteer organisation that act as an extension of the Alabama Department of Public Bealth, serving a seven county area in an laround the Binningham me tropolitanema, with CHO Joe Acter who has been very active with Mission Life line, and server as the President of the local Chapter of ARA.
- Piene Salice, MD, FACC, was appointed SIEMI Committee that by Clapter governor, Mile Honan, to serve as their lision to this process and representing cardiologist in the area.

- Dr. Stalice has excepted a wirthal community with cardiologist representing each of the rime international hospitals in the BREMISS area, and has communicated with them. He no weed hairs the STEMI Implementation Committee of BREMISS with an energy physician, Dr. Stalah Nafriger, with 22 multi-disciplinary members including those other cardiologist who serve onthe Chaptercornell.
  - Subcommittee include (1) a data collection committee (2) A group to increasing the EEG transmission from the field (3) A group to creatential prospective STERIC context. Initial plans are for parametrics to be trained in EEG interpretation although currently the plan seems to be to have modify also on computational metrics to then.
- The SIEMIFlen implements ton Committee of the Binningham Regional Emergency Medical Services System is comendy coolents ing SIEMI contains in the securicounty area around Binningham where half of the hospitals are PCIcapable. This organization is unless the unlocal of the Albama Deptof Public Health, and the committee is co-claimed by our chapter SIEMI claim and an emergency medicine physician from UAB. The plants modeled on our Insuna and Stole systems.
  - When the AL\_ACC considered trying to advance begind too to mandate
    this, we fill that since AHA had do when do the program based on so and
    searchiffic a vidence of boths patient outcomes from many communities
    around the country and around the world, that this could be done without
    be girly then in the name of quality can.
  - We have met very hitle of the resistance that many were anticipating threfar. Most of the physicians incommunity he public without a cardiologist. I suspect as which do not have to participate in the care of these patients.
  - We are hoping to rell this process out to the rest of the state of the lists more download. We felt that he gish than would just point me what is really a quality initiative, and manulably impir to standards of care of 2008 (now 2009), and would make the process less fluid and potentially more process to he bodity.

#### A R I ZCONA

Governor Steven S. Mohn, M.D., FA.C.C.

 The Chapter's organizing and bying ground work for a 2009 MLL meeting in the greater Phoenix and.

#### CALIFORNIA

Governor Gordon L. Fung M.D., FACC. Governor John Harold, M.D., FACC.

3rd Annual STEMI Summit in particular with ACEP
 June 5-4, 2009, La Ouinta, Palan Springs

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