RACE Coordinator Role
Systems of Care Coordinator Role

You Make it Happen!

STEMI Systems: *RACE* -> The ACCELERATOR Program and Expanding to Other Time Dependency Emergencies

Mayme Lou Roettig

on behalf of the Thousands of *RACE* Colleagues in North Carolina

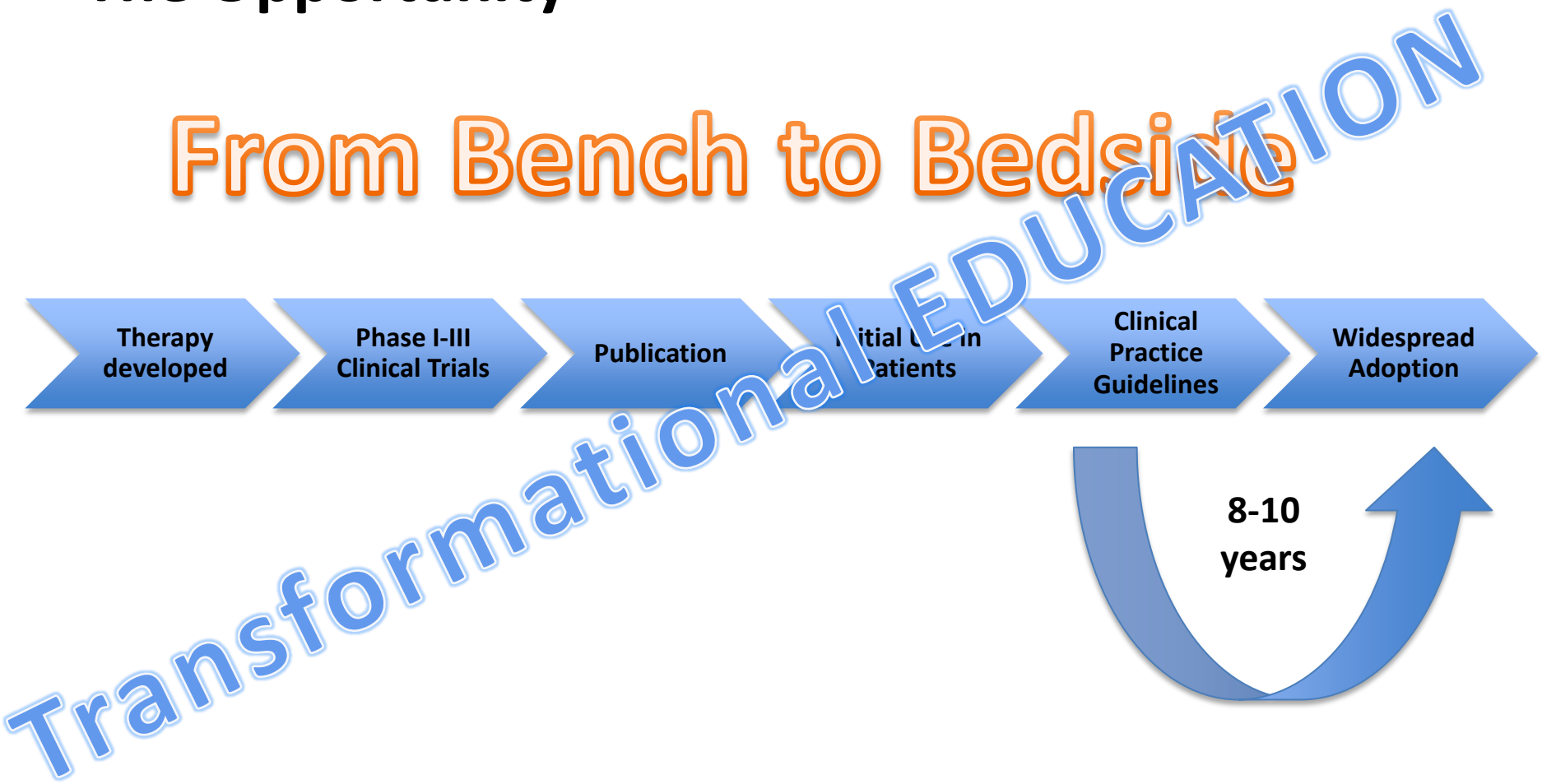


- Education-> specifically ~~Medical~~ Healthcare Practitioner Education
- How do we change physician and HC practitioners behaviors?
  - Measure It !!
    - Data Drives change- PI-CME; Disease state registries; potential of EMR…..Linked Pre-hospital-Hospital-Out-patient/Clinics
    - Measure per provider, practice, hospital- - -> “System”
  - Move their food
    - Reimbursement- Moving from RVUs to ACO quality cost payment incentives ; bundled payment



- Fragmentation of healthcare
- Cost of healthcare
  - Fiscal and human factors
- Competence and training of providers of healthcare
- Commercial Influences

The Opportunity



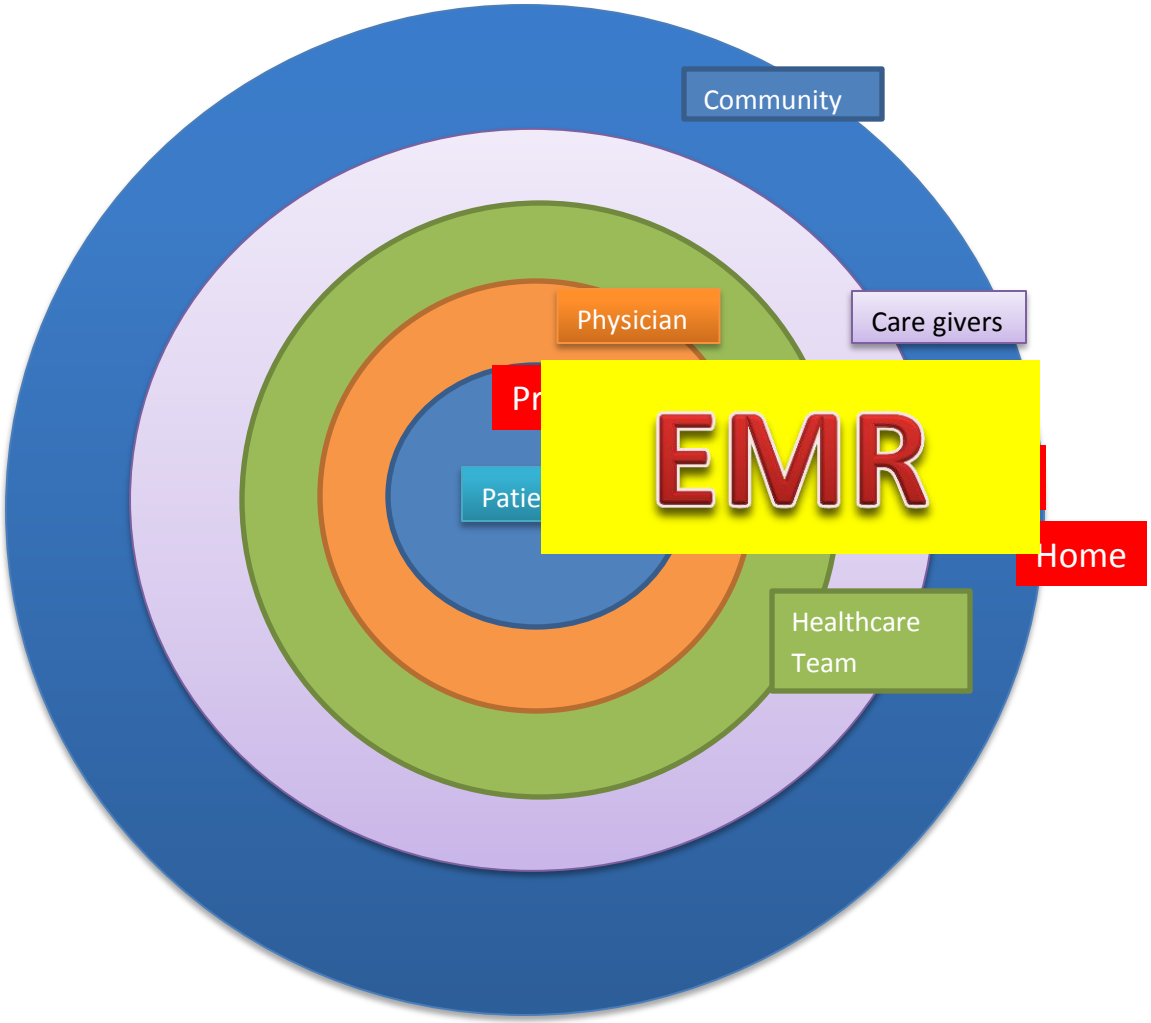


Can we provide an Outcomes- based system of care in the US?

Can HC research & education leaders provide scalable models that are sustainable?

- "..one thing is certain: the era of fragmented care delivery should draw to a close. Too many Medicare beneficiaries — like many other patients — have suffered at the hands of wasteful, ineffective, and poorly coordinated systems of care... "

Systems of Care Model





Can HC research & education leaders provide scalable models that are sustainable?

Lessons Learned from Reperfusion of Acute MI in Carolina Emergency Departments

Mayme Lou Roettig, RN MSN

Director, Systems of Care and Implementation Education

Assistant Director, Center For Educational Excellence

Duke University, Durham, North Carolina

Duke Clinical Research Institute

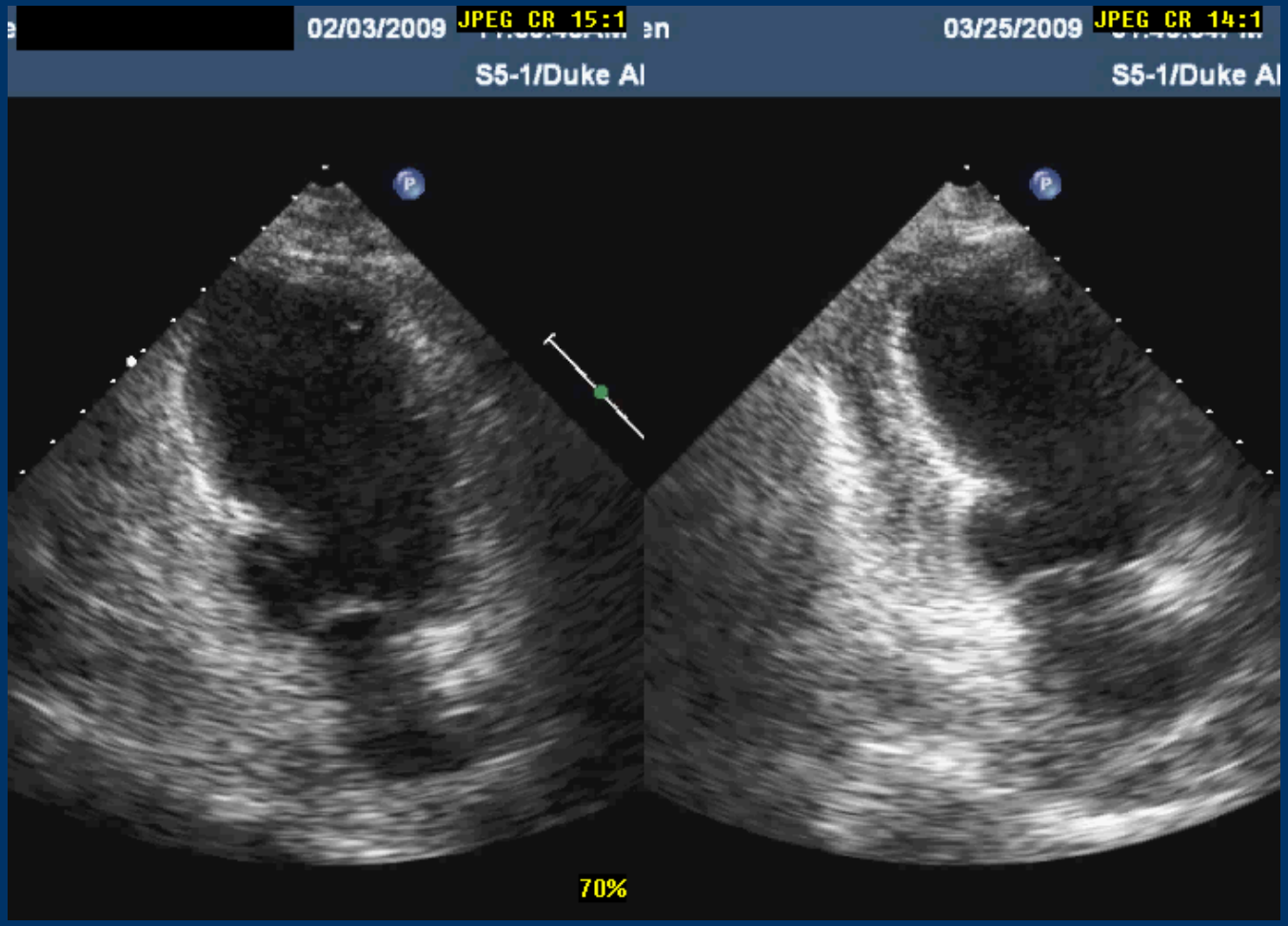
- “..one thing is certain: the era of fragmented care delivery should draw to a close. Too many Medicare beneficiaries — like many other patients — have suffered at the hands of wasteful, ineffective, and poorly coordinated systems of care... “

Donald M. Berwick, M.D., N Engl J Med 2011

The Evidence for Reperfusion Therapy

120+ minutes to device
"Cardiac cripple" or shock and death

< 60 minutes to device
Home in 3 days
Normal life



RACE-Duke pilot (2003)

FROM PAGE ONE

Duke project to give a boost to heart attack care

Hot line connects hospitals to Duke specialists day and night

BY JIM SHAMP
jshamp@heraldsun.com; 419-6633

More than half the people who have heart attacks in North Carolina don't get the clot-busting medicines or vein-widening angioplasties and stents considered the standard of proper care by cardiology professionals.

As a result, Duke Clinical Research Institute physicians announced Wednesday that they're embarking on an eight-hospital project to find roadblocks, streamline communications and develop strategies for the state's hospitals to use in saving lives.

"Who are these people who are eligible for lifesaving therapy and not getting it?" asked Mat Lotfi, a DCRI researcher leading the pilot project aimed at treating all patients in North Carolina within 90 minutes of their heart attack. "We're going to try to find out, characterize the problem, and find the best ways to deal with it."

Lotfi said some doctors in emergency departments in small rural hospitals sometimes are reluctant to make the quick life-and-death decisions that may be required for administering powerful clot-dissolving drugs such as t-PA, or tissue plasminogen activator.

"Some emergency physicians are worried both medically and legally about the possibility of creating a big bleed in someone's head by using these drugs," Lotfi said. "And they may not be equipped to perform angioplasty," the process of running a thin probe into a coronary artery to inflate a tiny balloon that can open a blockage and stop a heart attack.

The Duke-led regional pilot program brings together emergency medical specialists using a round-the-clock hot line to share expertise and speed up the doctors' response.

Under the pilot program, sponsored through a $160,000 grant from Genentech, the biotech firm that makes t-PA, a doctor at Person Memorial, Maria Parham or any of the other participating hospitals' emergency rooms can call a toll-free number any time of the night or day. Within 30 seconds, the caller is connected to a Duke cardiologist, Lotfi said.

Other hospitals in the program include Durham Regional; Alamance, Southeastern and Sampson regional medical centers; and Nash Health Care System in Rocky Mount.

Some participating hospitals that didn't have full-time electrocardiogram equipment and fax machines in their emergency departments now have them, he said, so their doctors can communicate data to the Duke cardiologist. If a patient's symptoms, medical history and EKG strip confirm a heart attack, the doctors at each end of the line can decide whether to give the patient medication or angioplasty immediately, or to transport the patient to Duke or another facility for specialized care.

"So far, since we started this May 4, we've been able to keep the total response time to under four minutes to make a decision," Lotfi said.

James Jollis, a Duke cardiologist on the team, said a patient came to one of the participating hospitals recently with chest pain and an EKG bearing some signs of a heart attack.

"Their doctor called the new hot line, and the decision was made to give the patient an immediate catheterization," Jollis said. Catheterization involves injecting dye into the coronary arteries to spot a blockage with a full-motion X-ray of the heart.

"It was the right decision, because it turned out this patient didn't have a blockage," Jollis said. "The EKG was a false reading, so the patient was spared the bleeding risk of getting a [clot-dissolving drug]."

The researchers said they hope to fine-tune the program to expand it statewide, and possibly throughout the nation.

INFORMED SOURCE

Mat Lotfi, 32, is a research associate with Duke Clinical Research Institute, specializing in health system development.

Lotfi grew up in Charlotte, but he moved to Canada when he was 17 years old. He completed his medical training, residency and specialty training at the University of Toronto, and came to Duke 10 months ago to participate in cardiology research. Lotfi, who is single, said he plans to be at Duke at least another year. He enjoys golf in his spare time.

Reperfusion of Acute Myocardial Infarction in Carolina Emergency Departments (RACE)

A Proposal to Improve Public Health in North Carolina
Through Improving Care of Heart Attack Patients

December 2, 2004

James Jollis, MD
Christopher Granger, MD

Executive director		$140,000 / year including benefits	$280,000
5 regional coordinators	(60% support from RACE project, and 40% support from regional center).	$50,000 / year including benefits from RACE	$500,000
Regional materials		$10,000 / region	$50,000
Director materials and support		$50,000	$50,000
Meeting support	4 semi-annual meetings	$30,000 / meeting	$120,000
Total			**$1,000,000**

ORIGINAL CONTRIBUTION

Implementation of a Statewide System for Coronary Reperfusion for ST-Segment Elevation Myocardial Infarction

James G. Jollis, MD
Mayme L. Roettig, RN, MSN
Akinyele O. Aluko, MD
Kevin J. Anstrom, PhD
Robert J. Applegate, MD
Joseph D. Babb, MD
Peter B. Berger, MD
David J. Bohle, MD
Sidney M. Fletcher, MD
J. Lee Garvey, MD
William R. Hathaway, MD
James W. Hoekstra, MD
Robert V. Kelly, MD
William T. Maddox Jr, MD
Joseph R. Shiber, MD
F. Scott Valeri, MD
Bradley A. Watling, MD
B. Hadley Wilson, MD
Christopher B. Granger, MD
for the Reperfusion of Acute Myocardial Infarction in North Carolina Emergency Departments (RACE) Investigators

Context Despite 2 decades of evidence demonstrating benefits from prompt cor nary reperfusion, registries continue to show that many patients with ST-segment e evation myocardial infarction (STEMI) are treated too slowly or not at all.

Objective To establish a statewide system for reperfusion, as exists for trauma ca to overcome systematic barriers.

Design and Setting A quality improvement study that examined the change in spe and rate of coronary reperfusion after system implementation in 5 regions in Nor Carolina involving 65 hospitals and associated emergency medical systems (10 pe cutaneous coronary intervention [PCI] hospitals and 55 non-PCI hospitals).

Patients A total of 1164 patients with STEMI (579 preintervention and 585 pos intervention) eligible for reperfusion were treated at PCI hospitals (median age 61 yea 31% women, 4% Killip class III or IV). A total of 925 patients with STEMI (518 pre- intervention and 407 postintervention) were treated at non-PCI hospitals (median age 62 years, 32% women, 4% Killip class III or IV).

Interventions Early diagnosis and the most expedient coronary reperfusion method at each point of care: emergency medical systems, emergency department, catheterization laboratory, and transfer. Within 5 regions, PCI hospitals agreed to provide single-call catheterization laboratory activation by emergency medical personnel, accept patients regardless of bed availability, and improve STEMI care for the entire region regardless of hospital affiliation.

Main Outcome Measures Reperfusion times and rates 3 months before (July to September 2005) and 3 months after (January to March 2007) a year-long implementation.

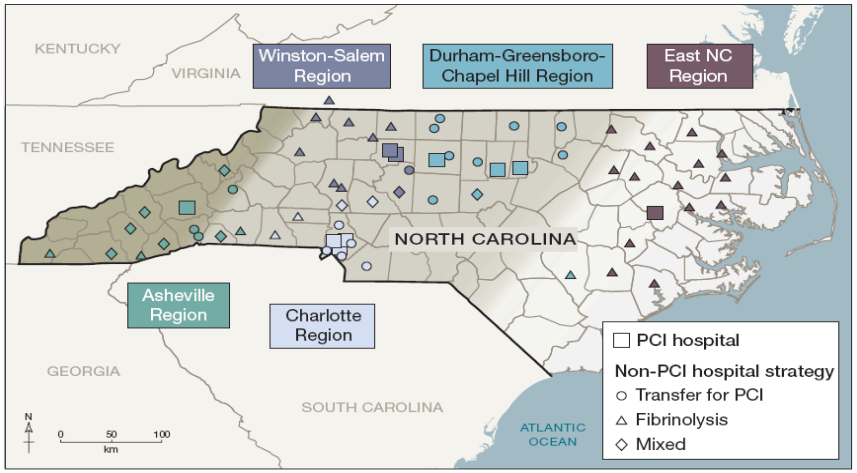
Results Median reperfusion times significantly improved according to first door-to-device (presenting to PCI hospital 85 to 74 minutes, $P<.001$; transferred to PCI hospital 165 to 128 minutes, $P<.001$), door-to-needle in non-PCI hospitals (35 to 29 minutes, $P=.002$), and door-in to door-out for patients transferred from non-PCI hospitals (120 to 71 minutes, $P<.001$). Nonreperfusion rates were unchanged (15%) in non-PCI hospitals and decreased from 23% to 11% in the PCI hospitals. For patients presenting to or transferred to PCI hospitals, clinical outcomes including death, cardiac arrest, and cardiogenic shock did not significantly change following the intervention.

Conclusions A statewide program focused on regional systems for reperfusion for STEMI can significantly improve quality of care. Further research is needed to ensure that programs that result in improved application of reperfusion treatments will lead to reductions in mortality and morbidity from STEMI.

JAMA. 2007;298(20):(doi:10.1001/jama.298.20.joc70124) www.jama.com

CORONARY HEART DISEASE, including myocardial infarction as its acute manifestation, is the leading cause of death worldwide.[1] In the United States, 3 times as many adults die from acute myocardial infarction as from motor vehicle crashes.[2] Similar to trauma, ST

Figure 1. RACE Regions and Hospitals According to Reperfusion System

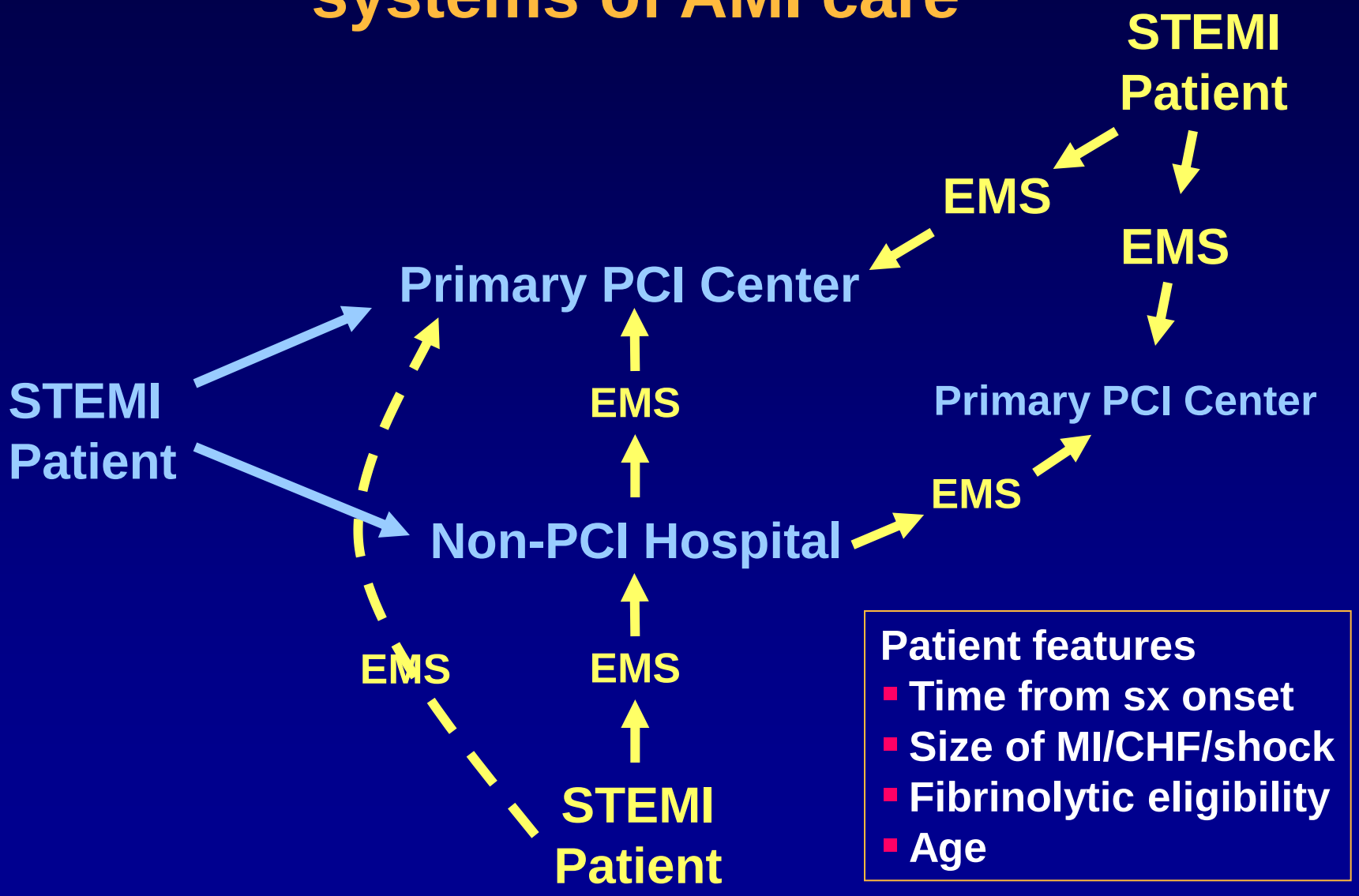


RACE indicates Reperfusion of Acute Myocardial Infarction in North Carolina Emergency Departments; PCI, percutaneous coronary intervention. Color gradient in map indicates major topographical differences from mountains in the west to coastal plains in the east. Mixed non-PCI hospital strategy selected fibrinolysis or transfer for PCI depending on whether expedient transfer was possible according to local weather and equipment availability.

One of AHA Top 10 Research Advances 2007

JAMA Nov. 2007

Patient journey through systems of AMI care



Patient features

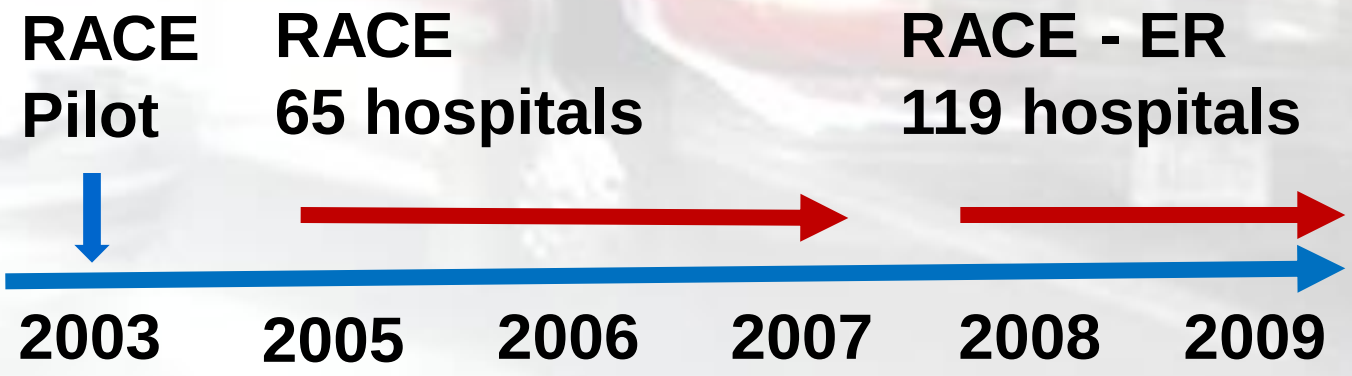
- Time from sx onset
- Size of MI/CHF/shock
- Fibrinolytic eligibility
- Age

Objectives

Regional approach to overcoming systematic barriers

1) Increase reperfusion rate

2) Increase speed of reperfusion



JAMA Nov. 2007

AHA 2010

RACE QI Process

1) Develop leadership, funding, data collection and feedback structure

2) Establish Regional PCI Centers (primary PCI, lytic ineligible, rescue)

3a) Hospital by hospital establishment of STEMI plan (review, consensus, training)

3b) EMS by EMS establishment of STEMI plan (review, consensus, training)

4) Improve the system

Measurement & Feedback

Defining roles and empowering health care providers: moving care forward


SUNOCO
CLARK
Budweiser
WIX

Leading STEMI Systems of Care & Regional Efforts - Regional Coordinators many "Hats"

"Patient Advocate"
-Across silo lines

Disease state experts

Liaisons for multidisciplinary teams

Coordinate Care Pathways & Protocol development

Quality Improvement Specialists

Educators

Leading STEMI Systems of Care & Regional Efforts - Regional Coordinators many "Hats"

Patient Advocate

Disease state experts
-Knowledgeable of the guidelines
And ALL aspects of care

Liaisons for multidisciplinary teams

Coordinate Care Pathways & Protocol development

Quality Improvement Specialists

Educators

Recommendations for Triage and Transfer for PCI (for STEMI) (cont.)

American Heart Association
Learn and Live

NEW Recommendation

I	IIa	IIb	III
C			

1. Each community should develop a STEMI system of care following the standards at least as stringent as those developed for *Mission Lifeline* to include:
   - Destination protocols to STEMI Receiving Centers
   - Transfer protocols for patients who arrive at STEMI Referral Centers and are primary PCI candidates, and/or are fibrinolytic ineligible and/or in cardiogenic shock

ACC/AHA 2009 Joint STEMI/PCI Focused Update. On Line Circulation; *JACC.*

Leading STEMI Systems of Care & Regional Efforts - Regional Coordinators many "Hats"

Charlotte Multi-disciplinary Regional team

Patient Advocate

Disease state experts

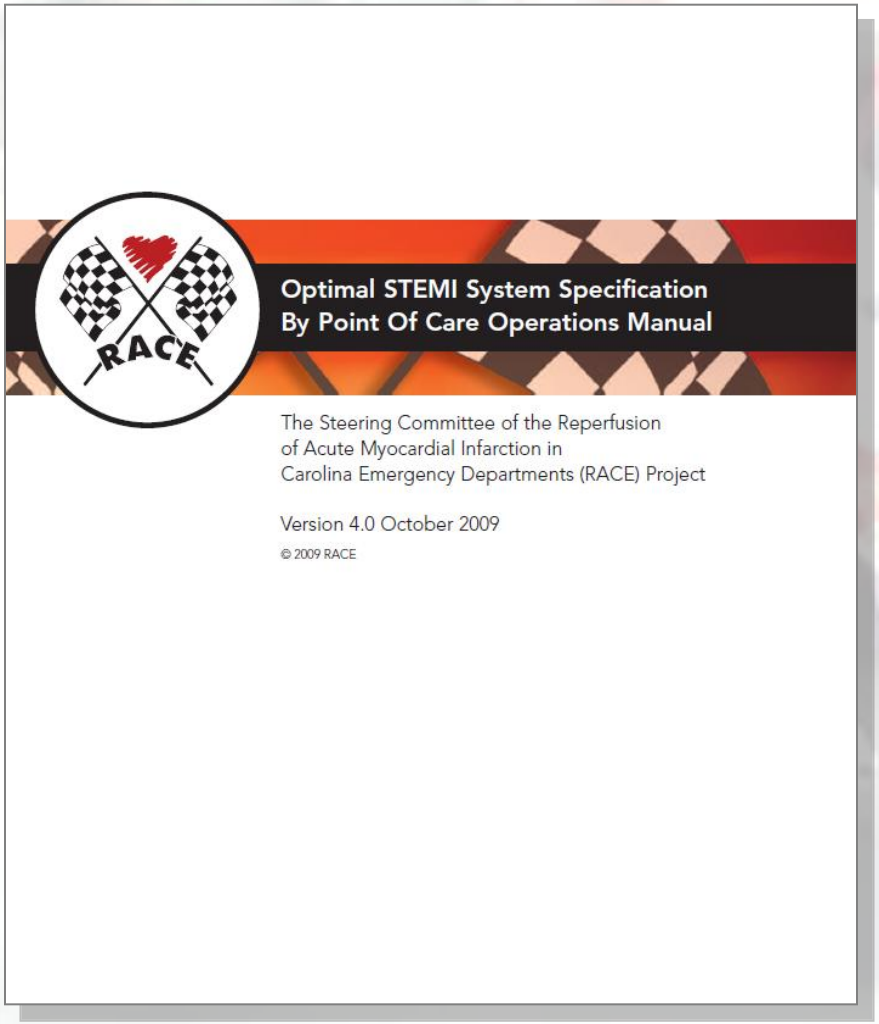
Liaisons for multidisciplinary teams

Coordinate Care Pathways & Protocol development

Quality Improvement Specialists

Educators

RACE
Interventions



OPERATIONS MANUAL

Optimal system specifications by point of care

- **EMS**
- **Non-PCI and PCI ED**
- **Transfer**
- **Catheterization lab**
- **Other system issues – payers, regulations**
- **Choice of PCI or lytic reperfusion regimens**

available at www.nccacc.org

Leading STEMI Systems of Care & Regional Efforts - Regional Coordinators many "Hats"

Patient Advocate

Disease state experts

Liaisons for multidisciplinary teams

Coordinate Care Pathways & Protocol development

Quality Improvement Specialists

Educators

If you don’t measure it, you can’t improve it

Quality & Data:

- Databases
  - NRMI
  - ACTION-GWTG
  - Quality Measures

- Quality of Data
  - Abstractors trained well
  - Seek completed data fields

Immediate feedback

- Useful for Process Improvement
  - Quarterly data reports
  - Know data base capabilities

ACTION Registry®-GWTG™

NCDR® ACTION Registry®- GWTG™ v2.2

Acute Coronary Treatment and Intervention Outcomes Network Registry

A. Demographics

Last Name[2000]:	**First Name**[2010]:	**Middle Name**[2020]:	**Birth Date**[2050]:
SSN[2030]: ☐SSN N/A[2031]	**Patient ID**[2040]:	**Other ID**[2045]:	

Race: (check all that apply) ☐ White[2070] ☐ Black/African American[2071] ☐ Asian[2072] ☐ American Indian/Alaskan Native[2073] ☐ Native Hawaiian/Pacific Islander[2074]

Hispanic or Latino Ethnicity[2076]: O No O Yes

Sex[2060]: O Male O Female

B. Admission

Patient Zip Code[3000]: ☐ Zip Code N/A[3001]

Means of Transport to First Facility[3100]: O Self/Family O Ambulance O Mobile ICU O Air

→ **If** Ambulance **or** Mobile ICU **or** Air, **Pre-Arrival 1st Med. Contact Date/Time**[3105, 3106]: _____ ☐ Time Estimated[3107]

Transferred from Outside Facility[3110]: O No O Yes → **If Yes, Means of Transfer**[3115]: O Ambulance O Mobile ICU O Air

→ **If** Yes, **Arrival at Outside Facility Date/Time**[3120, 3121]: _____ ☐ Time Estimated[3122]

→ **If** Yes, **Transfer from Outside Facility Date/Time**[3125, 3126]: _____ ☐ Time Estimated[3127]

→ **If** Yes, **Name of Transferring Facility/AHA Number**[3150, 3151]: _____

Your Facility

Arrival Date/Time[3200, 3201]:

Admission Date[3210]:

Location of First Evaluation[3220]: O ED O Cath Lab O Other

→ **If** ED, **Transfer Out Date/Time**[3221, 3222]: _____

Insurance Payors: (check all that apply) ☐ Private Health Insurance[3300] ☐ Medicare[3301] ☐ Medicaid[3302] ☐ Military Health Care[3303] ☐ State-Specific Plan (non-Medicaid)[3304] ☐ Indian Health Service[3305] ☐ Non-US Insurance[3306] ☐ None[3307]

HIC #[3320]:

C. Cardiac Status On First Medical Contact

Symptom Onset Date/Time[4000, 4001]: ☐ Time Estimated[4002] ☐ Time Not Available[4003]

First ECG Obtained[4010]: O Pre-Hospital (e.g. ambulance) O After 1st hosp. arrival

First ECG Date/Time[4020, 4021]:

STEMI or STEMI Equivalent[4030]: O No O Yes → **If Yes, ECG Findings**[4040]: O ST elevation O LBBB (new or presumed new) O Isolated posterior MI

→ **If** Yes, **STEMI or STEMI Equivalent First Noted**[4041]: O First ECG O Subsequent ECG

→ **If** Subsequent ECG, **Subsequent ECG with STEMI or STEMI Equivalent Date/Time**[4042, 4043]: _____

→ **If** No, **Other ECG Findings**[4044]: (demonstrated within first 24 hours of medical contact) O New or presumed new ST depression O New or presumed new T-Wave inversion O Transient ST elevation lasting < 20 minutes O None

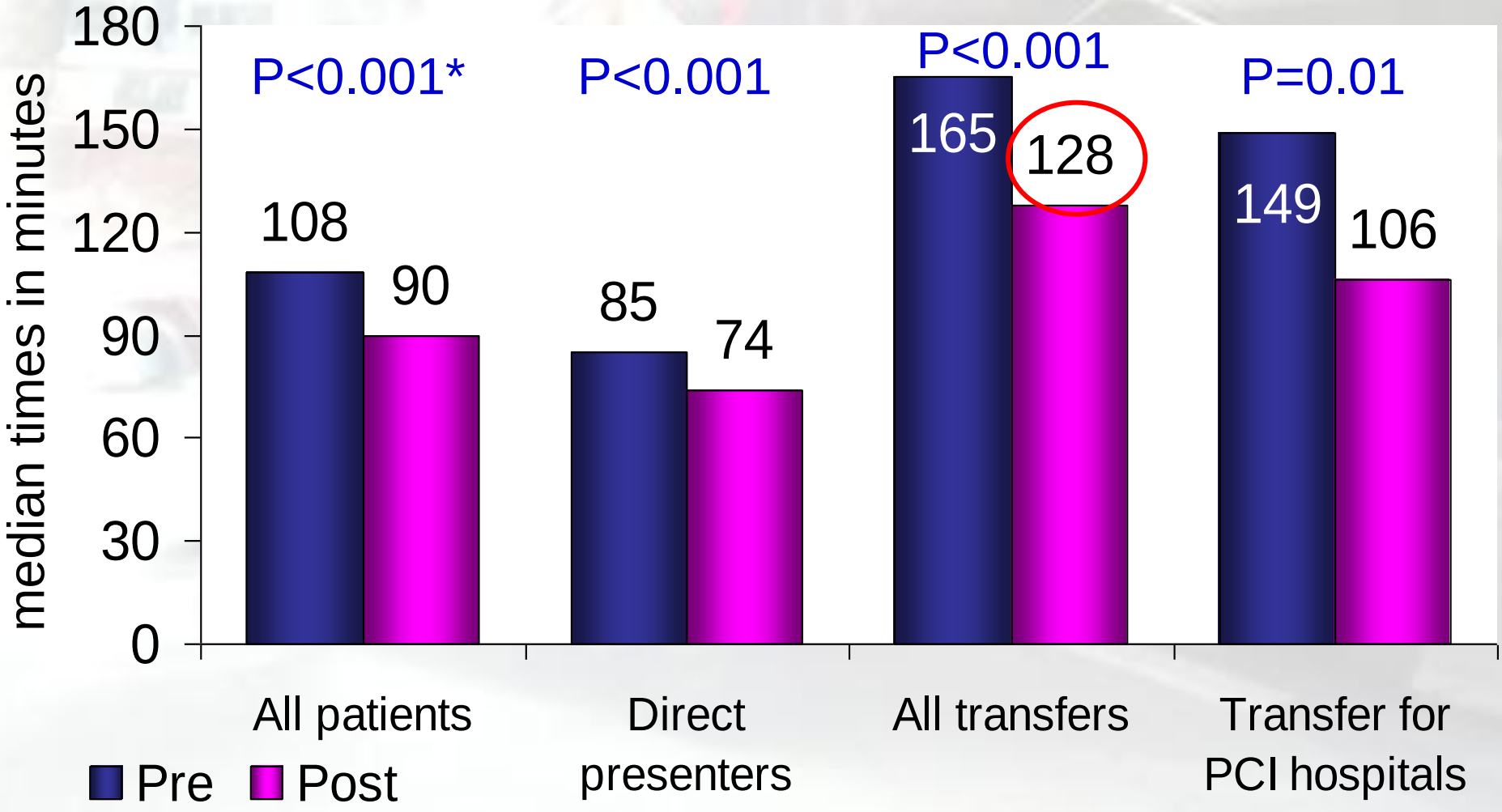
Heart Failure[4100]: O No O Yes	**Heart Rate**[4120]: (bpm)	**Cardiac Arrest**[4135]: O No O Yes
Cardiogenic Shock[4110]: O No O Yes	**Systolic BP**[4130]: (mmHg)	→ **If Yes, Pre-Hospital**[4140]: O No O Yes
Cocaine Use[4115]: O No O Yes		→ **If Yes, Outside Facility**[4145]: O No O Yes

D. History and Risk Factors

Height[5000]: (cm)	**Weight**[5010]: (kg)	**Prior Heart Failure** (previous Hx)[5090]: O No O Yes
Current/Recent Smoker (< 1 year)[5020]: O No O Yes		**Prior PCI**[5100]: O No O Yes
Hypertension[5030]: O No O Yes		→ **If Yes, Most Recent PCI Date**[5101]: _____
Dyslipidemia[5040]: O No O Yes		**Prior CABG**[5110]: O No O Yes
Currently on Dialysis[5050]: O No O Yes		→ **If Yes, Most Recent CABG Date**[5111]: _____
Chronic Lung Disease[5060]: O No O Yes		**Atrial Fibrillation or Flutter** (past 2 wks)[5120]: O No O Yes
Diabetes Mellitus[5070]: O No O Yes		**Cerebrovascular Disease**[5130]: O No O Yes
→ **If Yes, Diabetes Therapy**[5071]: O None O Diet O Oral O Insulin O Other		→ **If Yes, Prior Stroke**[5131]: O No O Yes
Prior MI[5080]: O No O Yes		**Peripheral Arterial Disease**[5140]: O No O Yes

RACE results

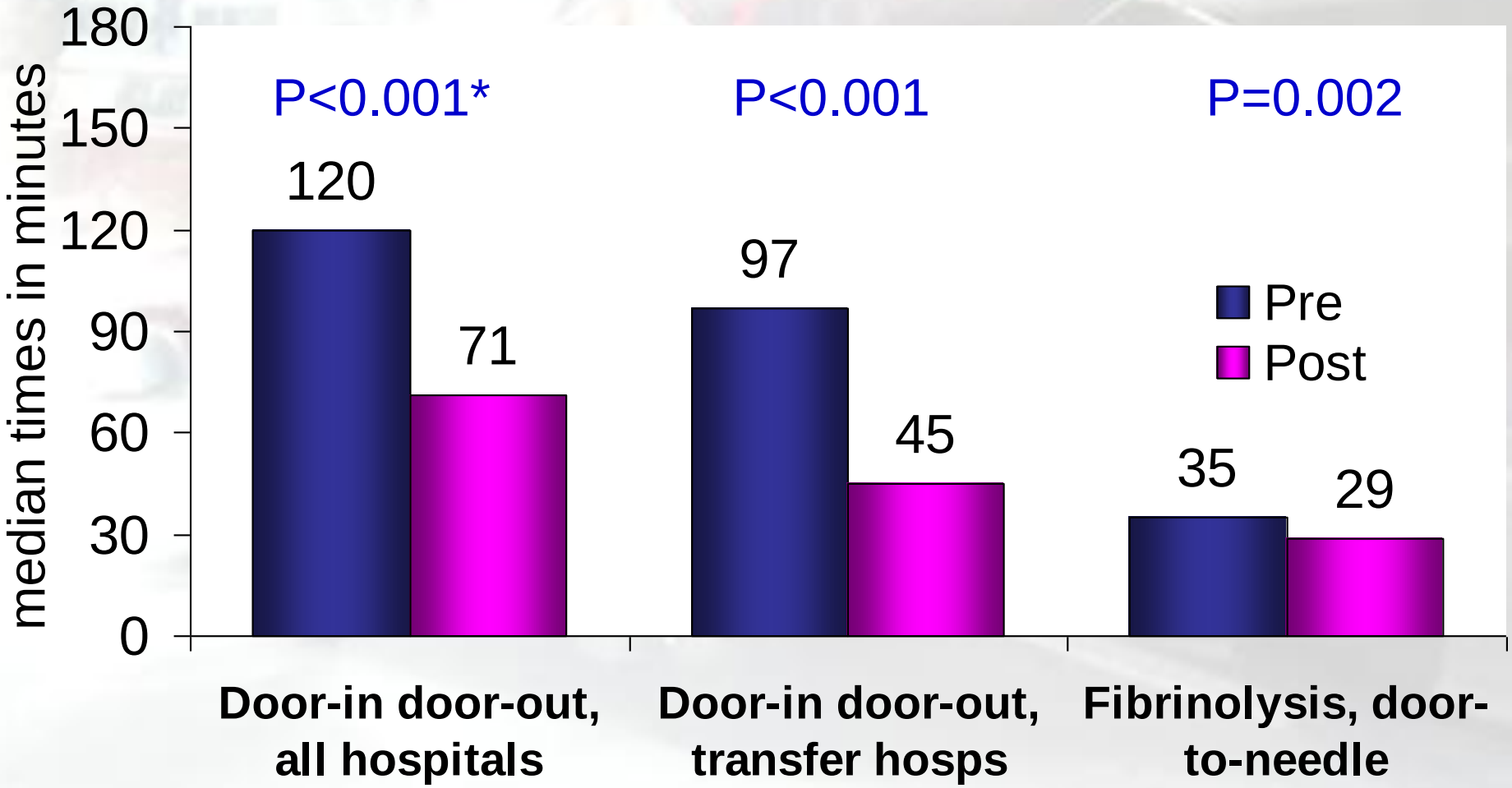
PCI hospitals: Door to device times



* Remained significant in analysis accounting for clustering

RACE results

Non-PCI hospitals: Reperfusion times



* Remained significant in analysis accounting for clustering

Leading STEMI Systems of Care & Regional Efforts - Regional Coordinators many "Hats"

Patient Advocate

Disease state experts

Liaisons for multidisciplinary teams

Coordinate Care Pathways & Protocol development

Quality Improvement Specialists

Educators

Role in STEMI & Systems of Care:

Educator:

Current guidelines ACC/AHA Guidelines

Anatomy and physiology

Process

Resources – flash drives

Data

On line training

Nursing & EMS Training

- Critical to success of STEMI & Systems of care is adequate Nursing and EMS Training
  - Formal training at launch time (1/2 full day programs) “Time Matters”
  - Monthly/quarterly STEMI Case review
  - ECG lunches in the ED
  - On-Line ECG Training Tools
  - STEMI education Webinars

Door to balloon is solved

First medical contact is new standard

Empower Team Members……..

“ We have a transfer plan in place and we do not need to call & ask for a bed, we just enact our plan and get the patient to a Facility w a Cath Lab-stat!”.
University non-PCI center, Charlotte, NC, end of RACE, Beginning of RACE-ER, Western NC- RACE-ER Launch.

Reperfusion of Acute Myocardial Infarction in Carolina Emergency Departments – Emergency Response (RACE-ER) Project

,

RACE ER

Expansion of a Regional ST-Segment–Elevation Myocardial Infarction System to an Entire State

James G. Jollis, MD; Hussein R. Al-Khalidi, PhD; Lisa Monk, RN, MSN; Mayme L. Roettig, RN, MSN; J. Lee Garvey, MD; Akinyele O. Aluko, MD; B. Hadley Wilson, MD; Robert J. Applegate, MD; Greg Mears, MD; Claire C. Corbett, MMS; Christopher B. Granger, MD; on behalf of the Regional Approach to Cardiovascular Emergencies (RACE) Investigators

Circulation. 2012;126:189-195

Sponsors/ Partners

RACE ER

North Carolina CHAPTER

MISSION: Lifeline

NORTH CAROLINA EMS OFFICE of EMS

Genentech
IN BUSINESS FOR LIFE

Medtronic

KATE B. REYNOLDS CHARITABLE TRUST

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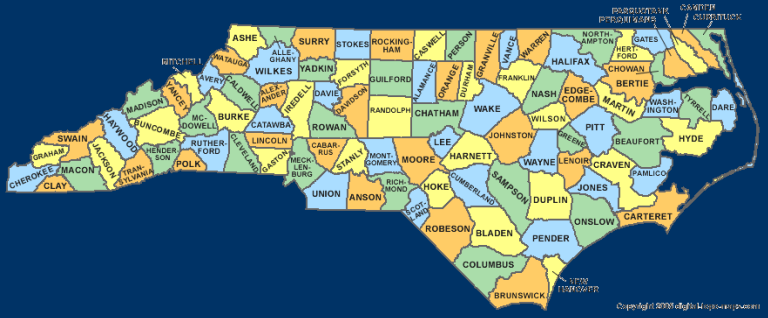


21 primary PCI centers

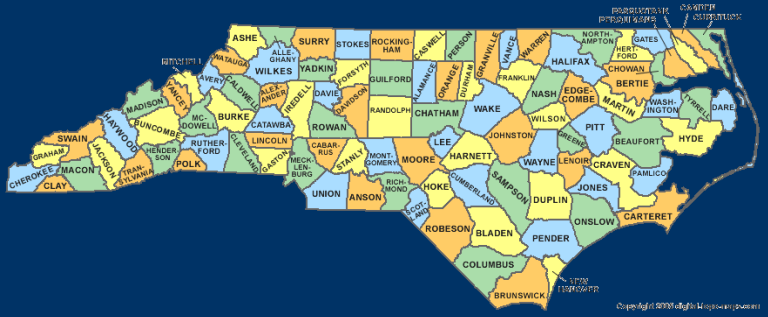
540 EMS systems

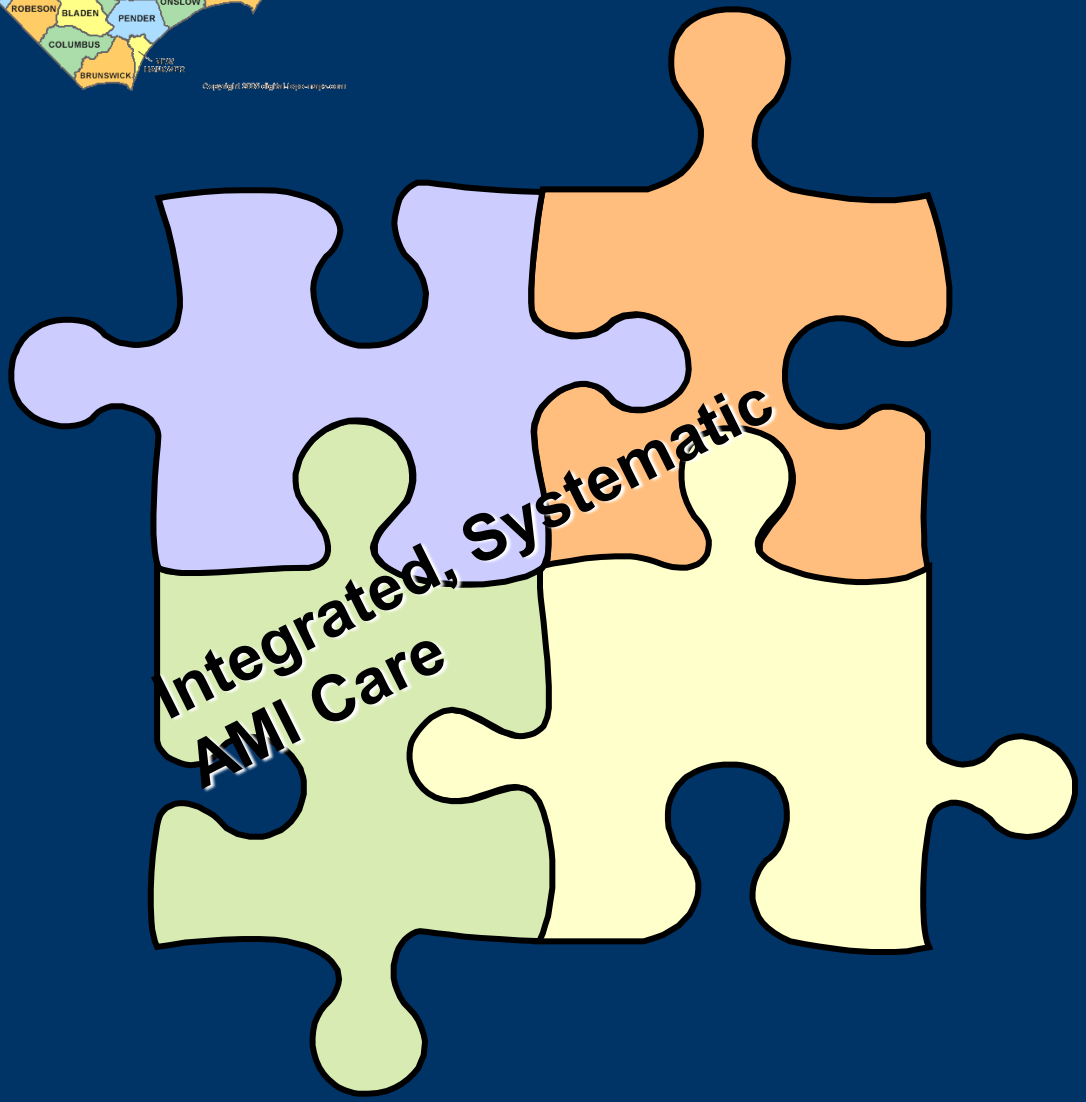
5,240 paramedics

18,000 EMTs

118 emergency departments

Duke Clinical Research Institute

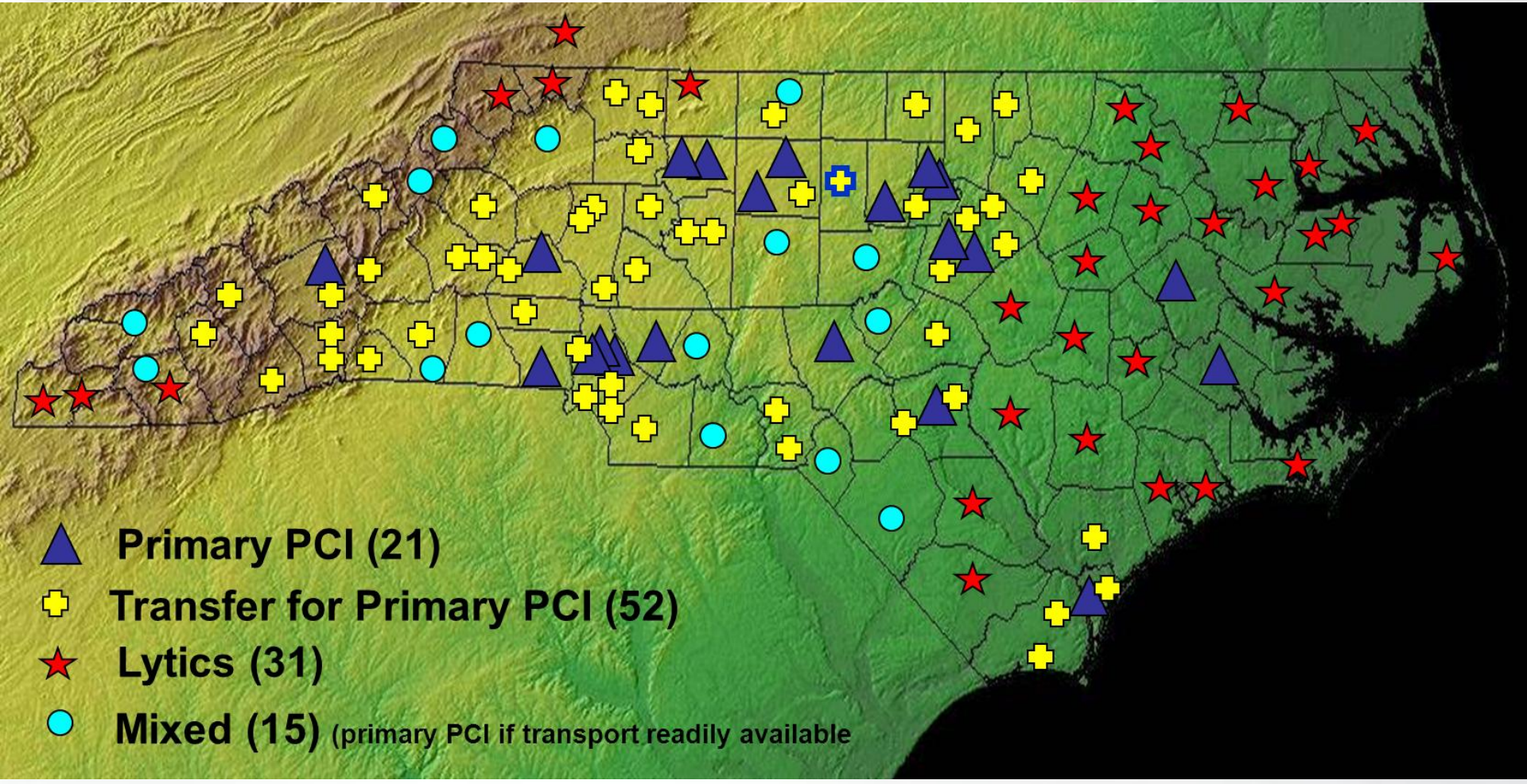

ASHE
SURRY
STOKES
ROCKING-HAM
CASWELL
PERSON
GRANVILLE
VANCE
WARREN
NORTH-AMPTON
GATES
HERT-FORD
ALLE-GHANY
WILKES
YADKIN
FORSYTH
GUILFORD
ALAMANCE
ORANGE
DURHAM
FRANKLIN
HALIFAX
CHOWAN
BERTIE
AVERY
CALDWELL
ALEX-ANDER
IREDELL
DAVIE
DAVIDSON
RANDOLPH
CHATHAM
WAKE
NASH
EDGE-COMBE
MARTIN
WASH-INGTON
TYRRELL
DARE
MADISON
BURKE
MC-DOWELL
ROWAN
WILSON
PITT
BEAUFORT
HYDE
SWAIN
BUNCOMBE
CATAWBA
LINCOLN
JOHNSTON
GREENE
GRAHAM
JACKSON
HENDER-SON
RUTHER-FORD
GASTON
CABAR-RUS
STANLY
MOORE
LEE
HARNETT
WAYNE
LENOIR
CRAVEN
CHEROKEE
MACON
POLK
MECK-LEN-BURG
MONT-GOMERY
CLAY
TRAN-SYLVANIA
UNION
ANSON
RICH-MOND
HOKE
CUMBERLAND
SAMPSON
DUPLIN
JONES
PAMLICO
SCOT-LAND
ROBESON
BLADEN
ONSLOW
CARTERET
PENDER
COLUMBUS
BRUNSWICK


Integrated, Systematic
AMI Care


BEAR REPUBLIC
INDEPENDENT
SINCE 1995
RACER
5
INDIA PALE ALE

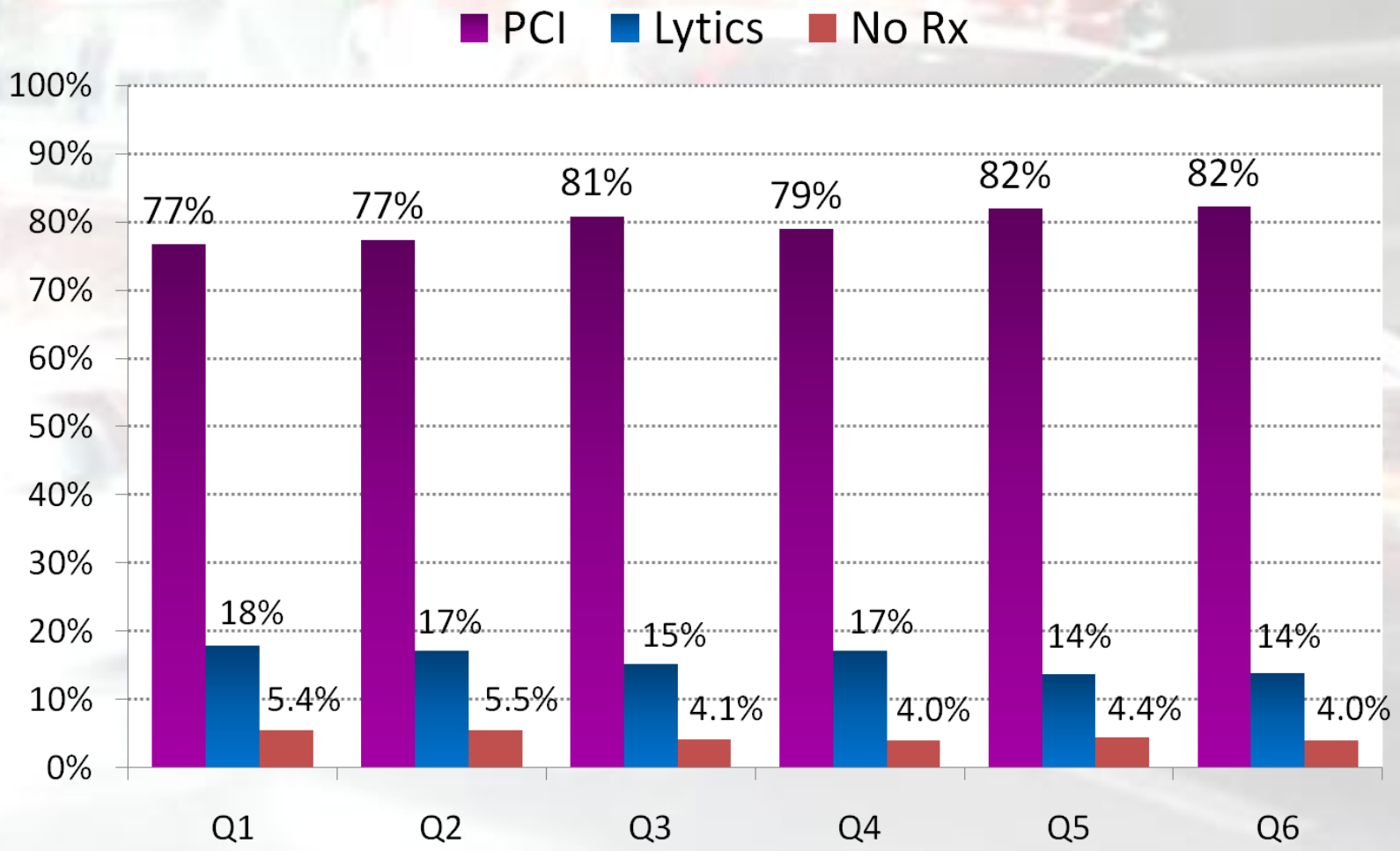
Added new coordinators around the State!!

RACE Hospitals by PCI and Reperfusion Designation



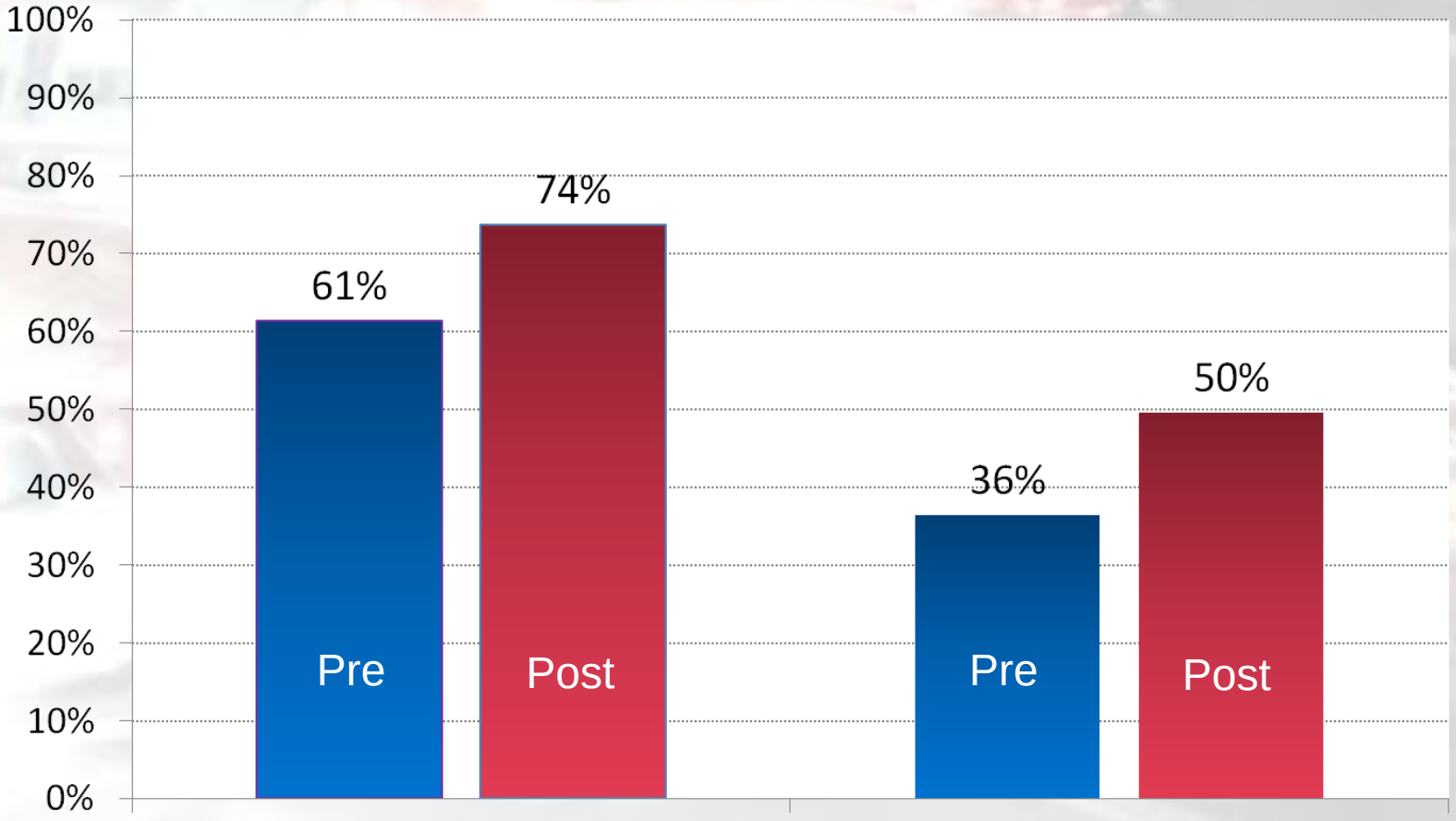
Reperfusion Strategy

Overall population, Eligible Patients



P = 0.0003 for PCI group trend

Direct Presenters: % Reaching Goal of Door to Device or 1st Medical Contact to Device < 90 minutes



Direct Walk-in

Door to Device

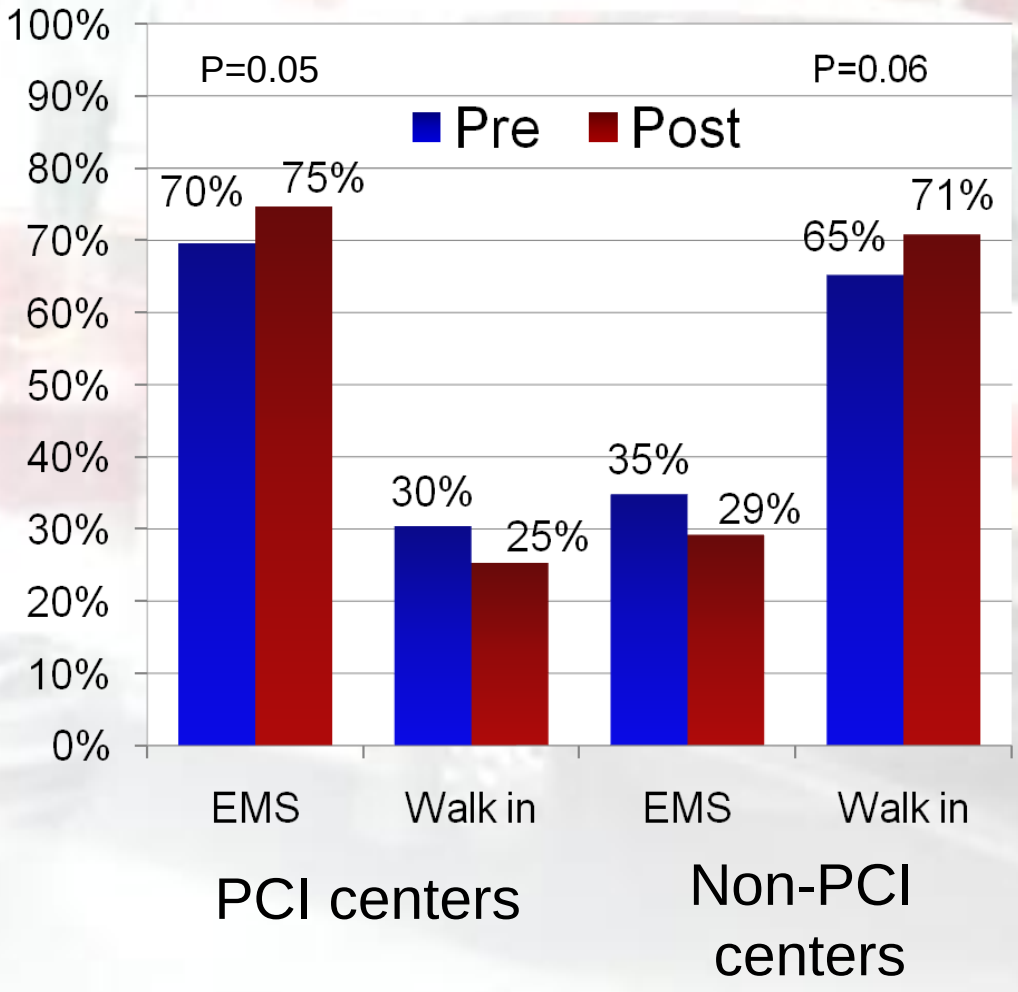
P=0.03

Direct EMS

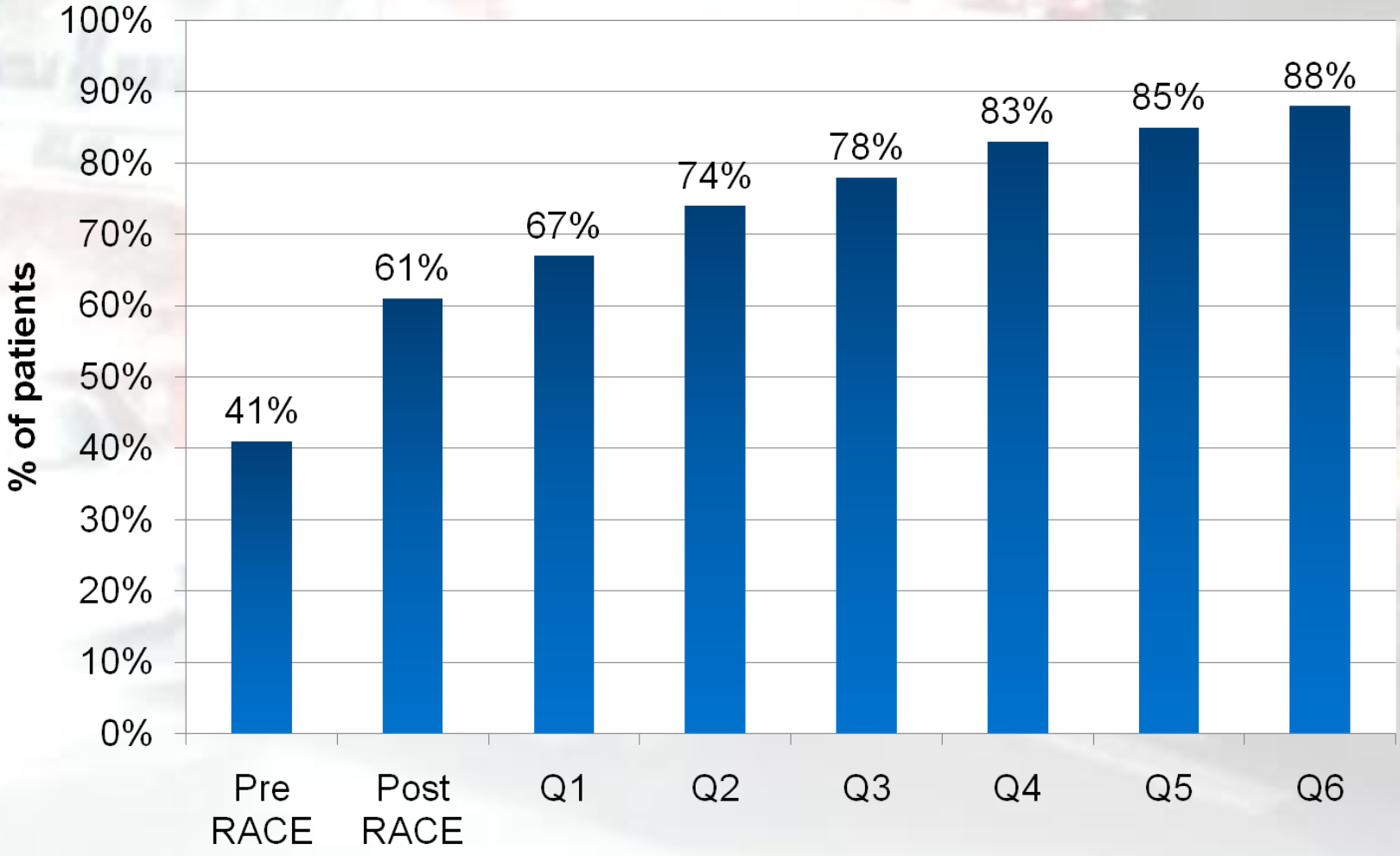
First Medical Contact to Device

P=0.0002

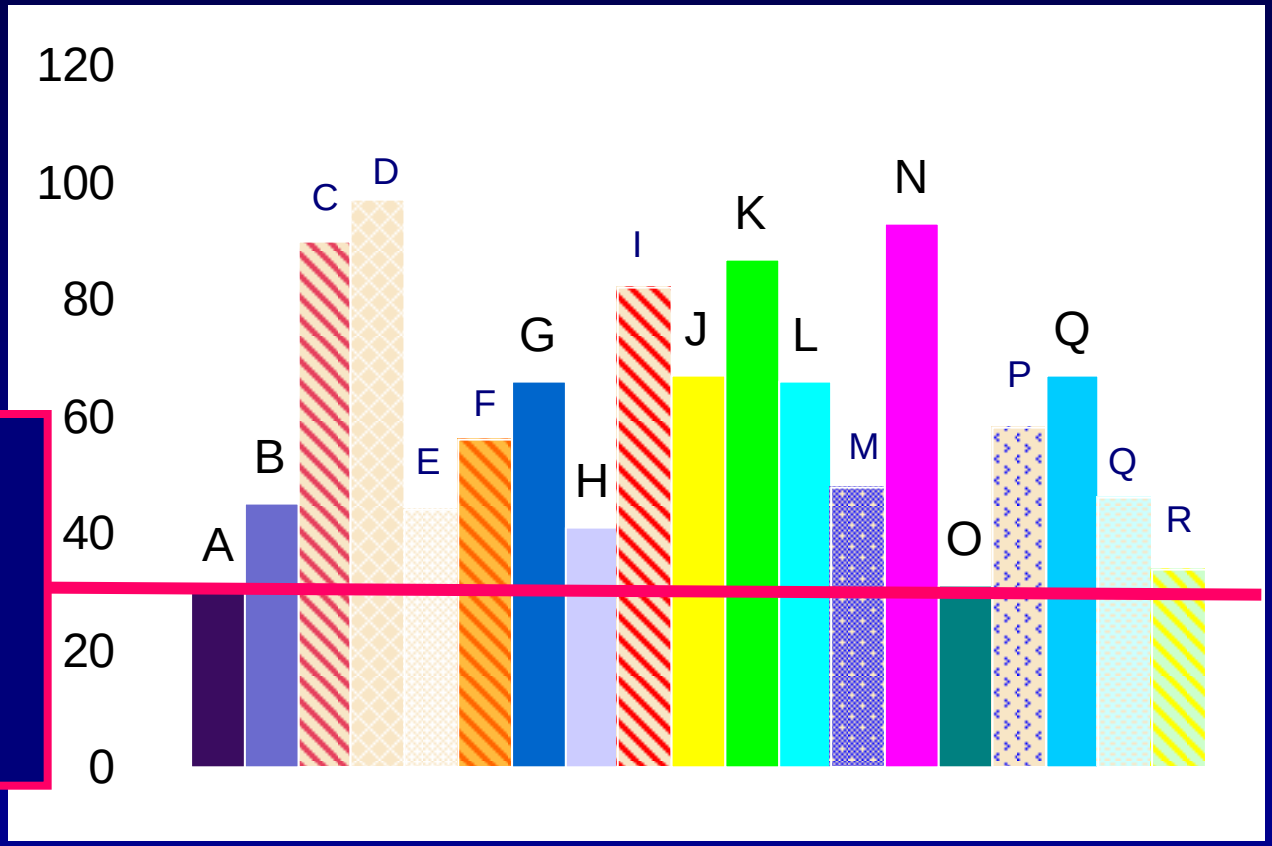
Fundamental Change in Patient Presentation by Hospital Type



Use of Pre-hospital 12-lead ECG
(Direct presenters via EMS to PCI Centers)

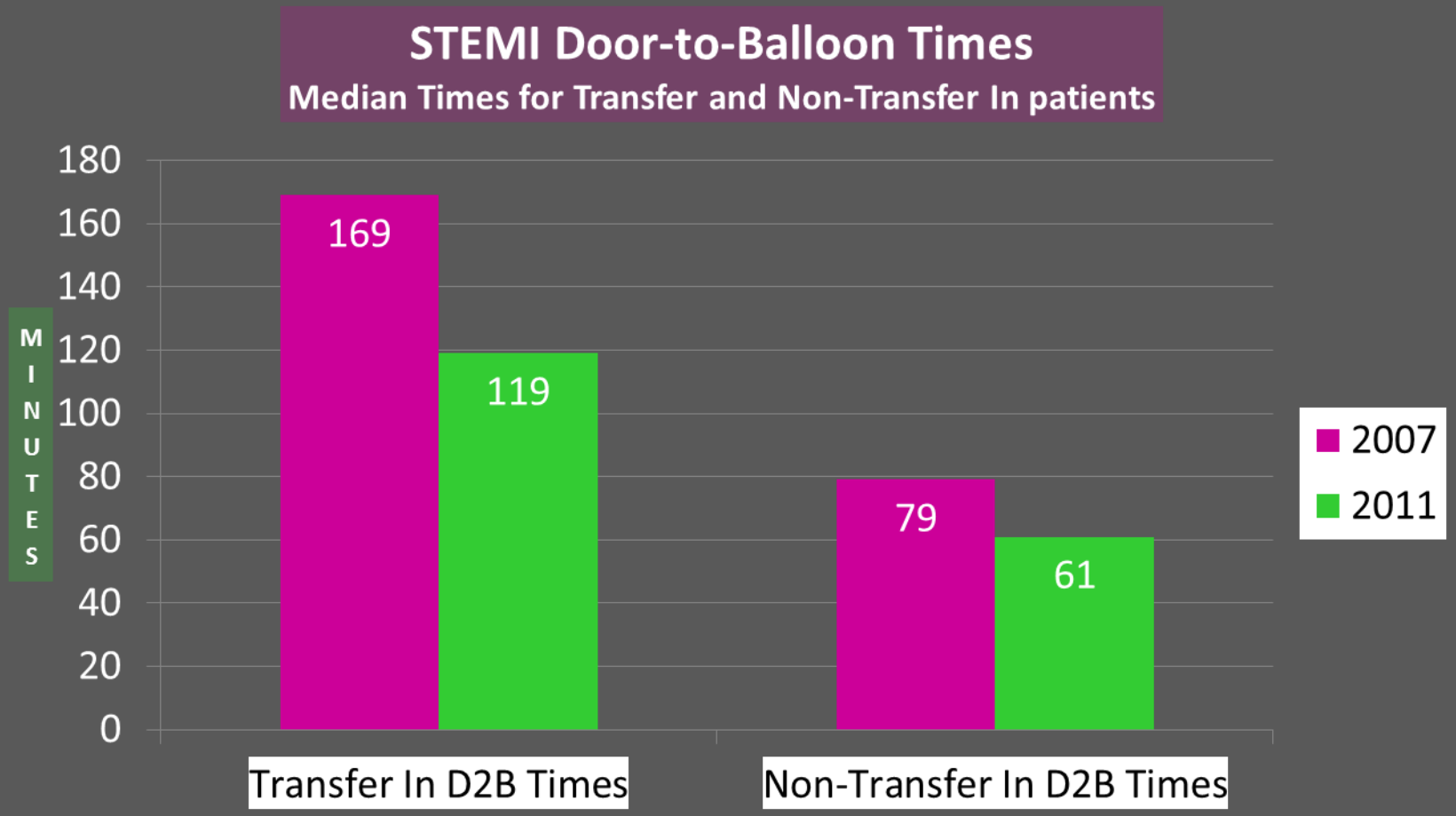


Alpha Blinded Coding Used in QI in North Carolina Hospitals: door-in-door-out



Goal = 30 min
Realism= median 45 minutes

21 primary PCI centers "A & R" pleased "C, D,.. N.." look for best practices associated with improved performance



ACTION Registry-GWTG

Mission: Lifeline Involvement

ML Hospital Registration

ML System Registration

Participation

Memorandum of Understanding

Quality Improvement/ Data Analysis

Recognition

Accreditation

American Heart Association
ACCREDITATION
Meets standards for
Heart Attack Referring Center

American Heart Association
ACCREDITATION
Meets standards for
Heart Attack Receiving Center

Participation, Recognition, & Certification criteria available:
www.americanheart/missionlifeline

Improving Care of ST Segment Elevation Myocardial Infarction in the United States 2008 to 2012: A Report from

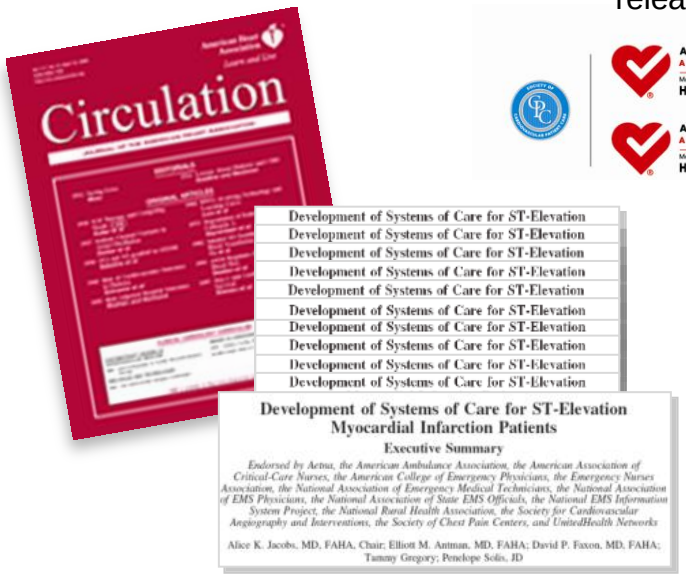
Christopher B Granger, Eric R. Bates, James G. Jollis, Elliott Antman, Graham Nichol, Robert E. O'Connor, Chris Bjerke, Tammy Gregory, S. Andrew Peng, Gray Ellrodt, Timothy D. Henry, William J. French, Alice Jacobs

History of Mission: Lifeline

MAY 2007

Eleven manuscripts are published in *Circulation* describing systems of care rationale and implementation plan

Mission: Lifeline was formally launched



2010 - 2011

2010 - Mission: Lifeline releases hospital reports and **Hospital Recognition Program**

2011 - AHA collaborates with SCPC and hospital accreditation program released

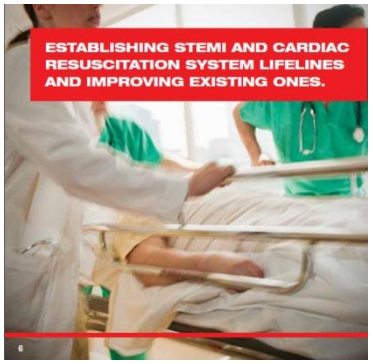
American Heart Association ACCREDITATION
Meets standards for Heart Attack Receiving Center

American Heart Association ACCREDITATION
Meets standards for Heart Attack Referring Center

MISSION: LIFELINE

APRIL 2012

Mission: Lifeline announces the addition of **Cardiac Resuscitation Systems of Care** to the program



Background

STEMI Point of Entry Protocol

Onset of symptom of STEMI

9-1-1 EMS dispatch

EMS on-scene
- Obtain 12-lead ECGs
- Consider prehospital fibrinolytic if capable and EMS-to-needle within 30 min

EMS Triage Plan

Hospital fibrinolysis:
Door-to-needle within 30 min

FMC to device within 120 min

STEMI-referral hospital (non PCI-capable)

Inter-hospital transfer

STEMI-receiving hospital (PCI-capable)

GOALS†

Patient	Dispatch	EMS on scene	EMS transport
5 min after symptom onset	1 min	within 8 min	Prehospital fibrinolysis: EMS-to-needle within 30 min

EMS transport:
EMS-to-balloon within 90 min

Patient self-transport:
Hospital D2B within 90 min

Total ischemic time: Within 120 min*

*** Golden Hour = First 60 minutes**

2013 ACCF/AHA Guideline for the Management of ST-Elevation Myocardial Infarction

Regional Systems of STEMI Care

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.

Mission: Lifeline Goals

- Promote the ideal STEMI and cardiac resuscitation systems of care
- Bring together healthcare resources into an efficient, organized, coordinated system at the community level
- Improve overall quality of care

Methods

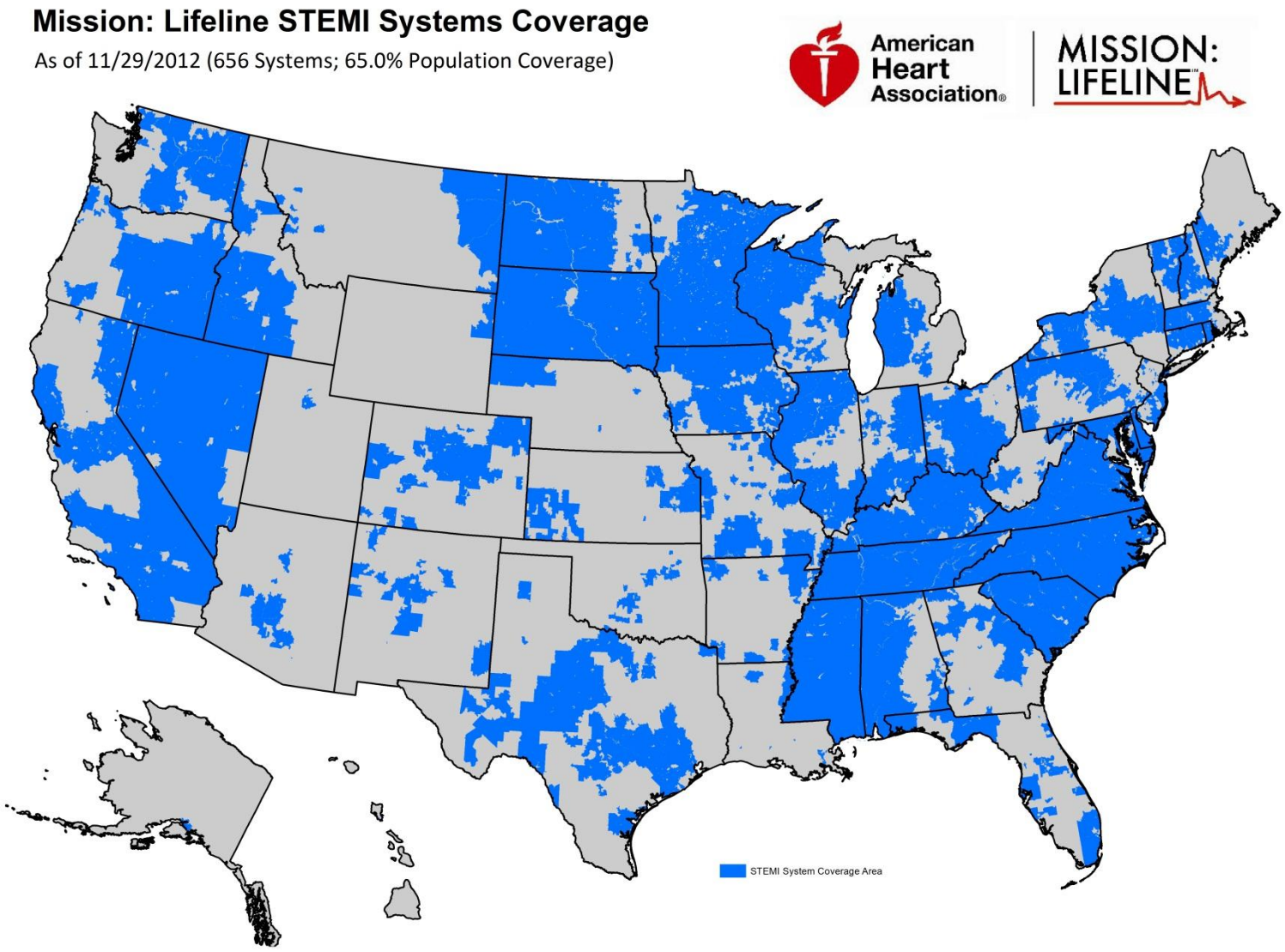
- STEMI patients admitted to hospitals registered with Mission: Lifeline program 2008 to 2012
- Tools for improving EMS, hospital transfer, PCI hospital care provided through Mission: Lifeline website, webinars, regional meetings, supported by local leaders and AHA staff
- Hospitals measure processes and outcomes using ACTION Registry/Get with the Guidelines
- In-hospital adjusted mortality was calculated including and excluding cardiac arrest as a reason for PCI delay (collected since 2008) and pre-hospital cardiac arrest (collected since 2011)

Results

Total of 147,466 patients at 485 hospitals over 5 years

	Year				
	2008	2009	2010	2011	2012
Hospitals (n)	179	224	334	383	445
STEMI patients	18583	21670	29886	35683	41644
Not treated with reperfusion, eligible patients (%)	6.2	6.2	6.2	4.4	3.3

485 hospitals representing 46 states



Results

Baseline characteristics and reperfusion strategy

Variable	Year				
Baseline characteristics	**2008**	**2009**	**2010**	**2011**	**2012**
Age (yrs)*	60 (52,71)	60 (52,71)	60 (52,71)	61 (52,71)	61 (52,70)
Female sex (%)	30	30	30	30	30
Systolic BP (mmHg)	138	140	140	140	140
Heart rate (bpm)	78	78	79	79	79
Killip class IV (%)	6.8	8.4	8.4	7.9	7.7
Time symptom onset to FMC (minutes)*	50 (21,120)	50 (23,120)	50 (23,120)	52 (24,120)	49 (23,115)
Reperfusion strategy	**2008**	**2009**	**2010**	**2011**	**2012**
Primary PCI for transfer-in (%)	62	68	72	85	90
Fibrinolytic therapy (%)	13.4	11.1	9.0	7.4	7.0

*median (25th, 75th percentile)

Results

Prehospital ECGs and reperfusion times

Variable	Year				
EMS direct to PCI centers (n= 58,624)	**2008**	**2009**	**2010**	**2011**	**2012**
Pre-hospital ECG (%)	45	58	61	66	71
FMC to device (minutes)*	93 (77,111)	89 (74,108)	88 (72,106)	85 (70,104)	84 (68,102)
Transfer to PCI centers (n=47,404)	**2008**	**2009**	**2010**	**2011**	**2012**
Door-in-door-out (minutes)*	76 (48,125)	71 (46,115)	66 (42,107)	64 (40,105)	62 (39,101)
First door to device (minutes)*	130 (101,181)	122 (98,164)	119 (93,161)	114 (90,153)	112 (89,151)

*median (25th, 75th percentile)

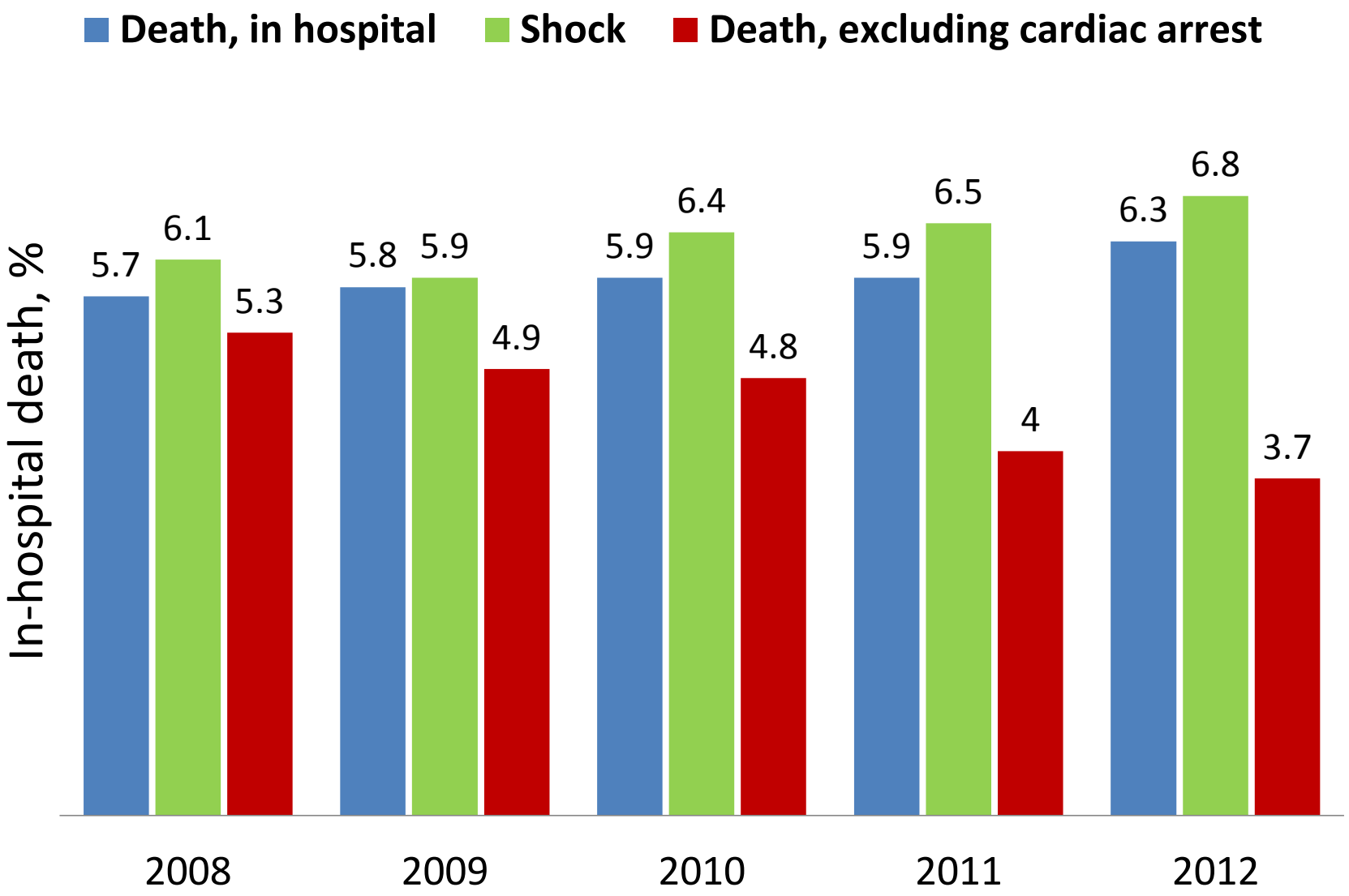
Results

Door-to-device and composite performance score

Variable	Year				
All direct presenters to PCI centers (n=69502)	**2008**	**2009**	**2010**	**2011**	**2012**
Door-to-device, minutes	68 (52,86)	63 (48,80)	61 (47,78)	60 (44,76)	59 (43,75)
STEMI performance composite score	**2008**	**2009**	**2010**	**2011**	**2012**
Aspirin, beta blocker, ACE-inhibitor, reperfusion therapy, D2B≤ 90 min, statin, EF evaluation, smoking cessation, rehab referral	100 (88,100)	100 (89,100)	100 (89,100)	100 (100,100)	100 (100,100)

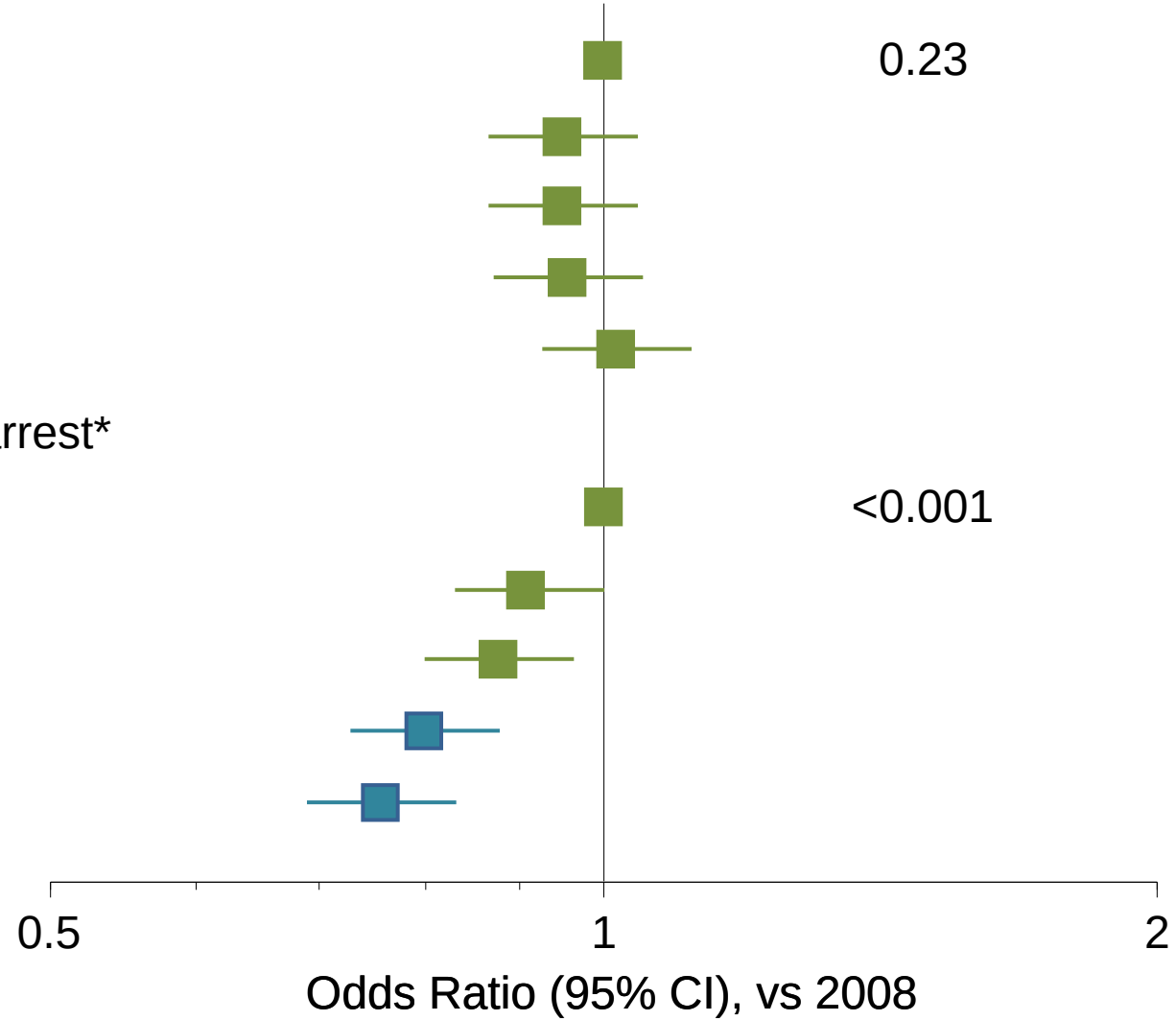
*median (25th, 75th percentile)

Results: In hospital outcomes



Adjusted In-Hospital Mortality

Mortality		P value (trend)
2008	1.00 (ref)	0.23
2009	0.95 (0.87, 1.05)	
2010	0.95 (0.87, 1.03)	
2011	0.96 (0.89, 1.05)	
2012	1.03 (0.94, 1.12)	
Mortality, excluding cardiac arrest*		
2008	1.00 (ref)	<0.001
2009	0.90 (0.81, 1.00)	
2010	0.86 (0.79, 0.94)	
2011	0.78 (0.71, 0.86)	
2012	0.75 (0.68, 0.83)	



* prehospital cardiac arrest data collected since 2011

Conclusions

- A comprehensive national systems of care program has significantly improved quality of care for STEMI including
  - EMS diagnosis and activation of reperfusion
  - Increased use of reperfusion therapy
  - Expanded use of primary PCI
  - Faster primary PCI
- Unadjusted rates of shock and mortality increased over the 5 years
- When removing patients with known cardiac arrest, that was more extensively collected since 2011, and adjusting for other predictors, mortality decreased by 25%
- This highlights the impact of the program to date and the need for improving system-level care for out-of-hospital cardiac arrest, an ongoing objective of Mission: Lifeline.

STEMI ACCELERATOR PROGRAM SPOTLIGHT

ACCELERATOR OVERVIEW

Mayme Lou Roettig, RN, MSN

On behalf of the Thousands of Healthcare Providers & the AHA Leading the ACCELERATOR Regions

Duke Clinical Research Institute

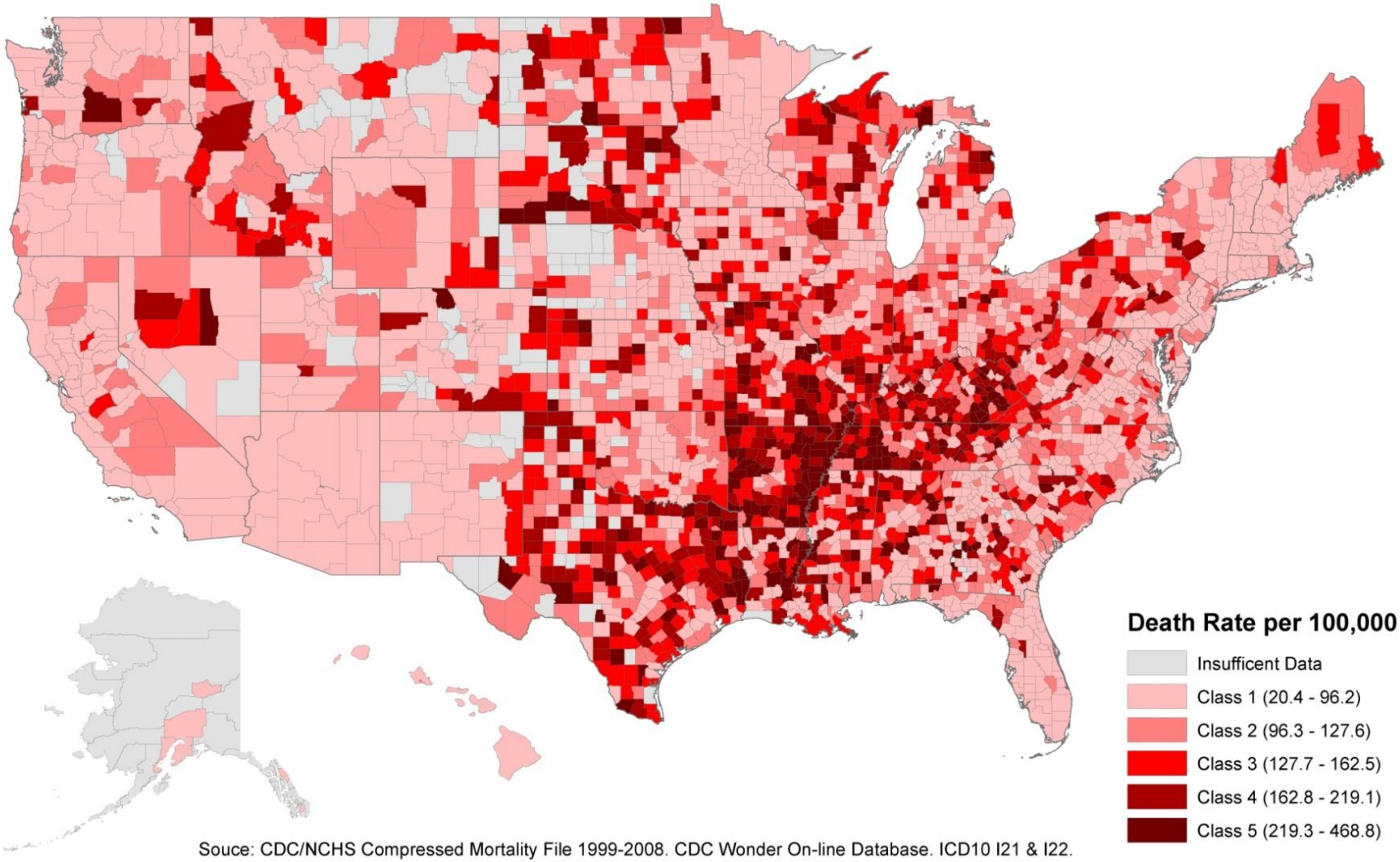
DCRI Center for Educational Excellence in Collaboration with the American Heart Association

REGIONAL SYSTEMS OF CARE DEMONSTRATION PROJECT:
MISSION: LIFELINE™ STEMI SYSTEMS ACCELERATOR

"Where you live should not determine whether you live"

American Heart Association. | MISSION: LIFELINE

2004-2008 Acute Myocardial Infarction (IDC10 I21 & I22)
35+ Age Adjusted Death Rate per 100,000



Souce: CDC/NCHS Compressed Mortality File 1999-2008. CDC Wonder On-line Database. ICD10 I21 & I22.

Objectives

- Establish a regional standard of emergency cardiovascular care that includes every hospital and EMS agency.
- Lower cardiovascular mortality by broadly improving the timely treatment of ST elevation myocardial infarction (STEMI) patients.
- Create a sustainable system for treating cardiovascular emergencies including STEMI, cardiac arrest, stroke and aortic dissection.

National Program Sponsors Through Educational & Research Grants to Duke Clinical Research Institute

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The Center for Educational Excellence

Promoting excellence in clinical care and patient safety around the world

American Heart Association.

MISSION: LIFELINE

Education Outcomes Study Design

- Application Process
- National faculty selected regions based on readiness (large MSA, leadership, ECG equipped EMS, willingness to recruit primary PCI centers into a centralized database)
- Leadership Triad
  - Regional Leadership
  - AHA Local Staff
  - National Faculty Mentorship (Paired Teams)

STEMI SYSTEMS ACCELERATOR Intervention

Physician Faculty

Peter Berger, MD - Interventionalist; Geisinger Clinic, Danville, PA

Harry Dauerman, MD- Interventionalist; University of Vermont, Burlington, VT

William Koenig, MD-ED Medicine

Los Angeles EMS Medical Director

Lee Garvey, MD- EMS/ED Medicine; CMC Charlotte, NC

Christopher B. Granger, MD- Cardiologist; Duke University Medical Center, Durham

James G. Jollis, MD- Cardiologist; Duke University Medical Center, Durham, NC

Greg Mishkel,MD - Interventionalist; Prairie Heart , Springfield, IL

Ivan Rokos, MD- Emergency Medicine; Los Angeles, CA.

B. Hadley Wilson, MD- Interventionalist; CMC Charlotte, NC -Sanger Clinic

Implementer Faculty

Claire Corbet, MS, EMT-P; Paramedic and Regional System Implementer- New Hanover Medical Center, NC

Loni Denne, RN, BSN; Nurse and Regional System Implementer (Austin and now Southwest USA; American Heart Association, SR. ML Director.

Russell Griffin, EMT-P, Dallas Project

American Heart Association

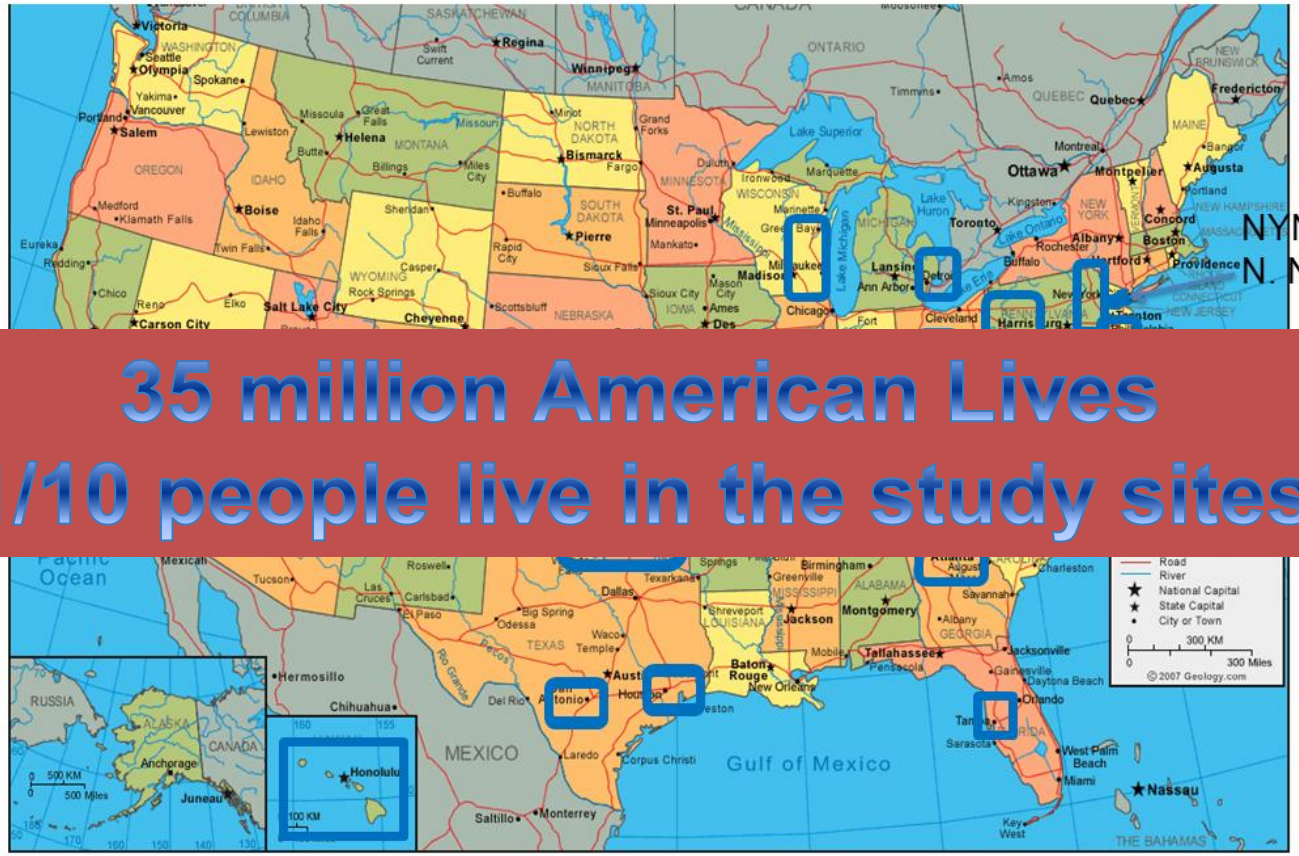
Mayme Lou Roettig, RN, MSN; CV Clinical Nurse Specialist and Regional & State System Implementer; DCRI- Durham, NC

Stephanie Starling, MBA, RN, MSN; Nurse and Regional System Implementer; Forsyth Cardiac & Vascular Center, Novant Health Winston-Salem, NC

Design (cont)

- Pre intervention strategic planning
  - weekly or biweekly calls, geospatial maps, regional politics and opportunities
- Education CME Intervention Evening & Day
  - Night before CME leadership dinner
  - multi-disciplinary attendance
- Recruitment into centralized data repository
  - NCDR ACTION REGISTRY- GWTG
- Data- Baseline, Quarterly for 1 year, Post Intervention
- Quarterly meetings to share best practices, data review across the region and identify strategies to improve process
- Development of regional EMS and Transfer plan

Regional Systems of Care Demonstration Project
Mission Lifeline STEMI Accelerator



35 million American Lives
1/10 people live in the study sites

STEMI Accelerator Sites

STEMI SYSTEMS ACCELERATOR
Intervention Sites

Great Rivers
- Columbus, OH
- Pittsburgh, PA
- Philadelphia, PA
- Louisville, KY
- Wilkes-Barre/Scranton

Midwest
- Detroit
- Central Indiana
- East Wisconsin
- St. Louis

Founders
- New York City
- N. New Jersey
- Hartford

Greater South East
- East Tennessee
- Tampa
- Atlanta

Western States
- Kern County, CA
- Hawaii

South West
- Colorado (East Range)
- Houston
- San Antonio
- Oklahoma City

21 Regions & 16 have met study requirements

Develop a Regional Plan

Non-PCI hospital lab activation protocol

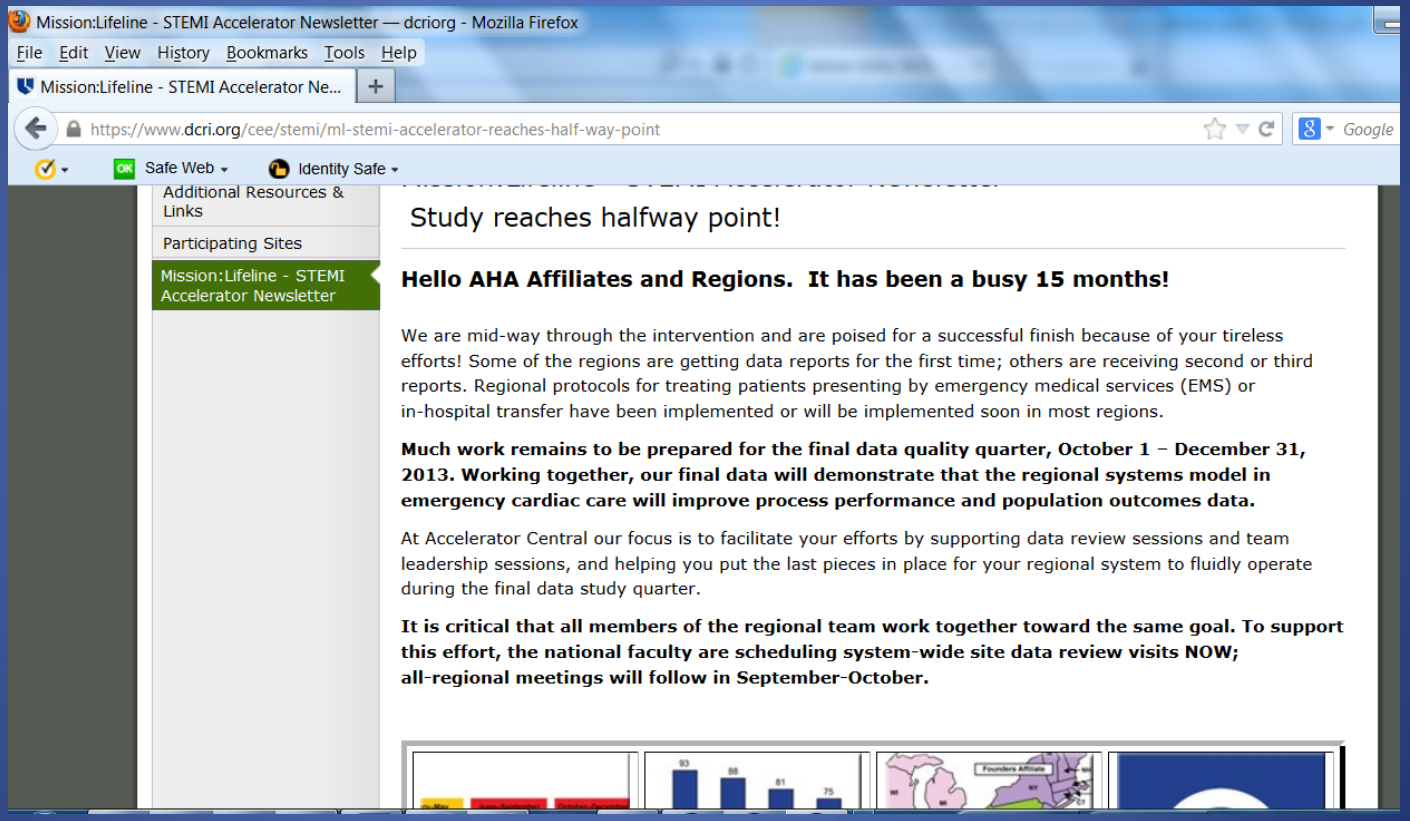
- Symptoms of acute coronary syndrome greater than 15 minutes - less than 12 hours.
- ECG diagnosis
  - ST segment elevation in two contiguous leads
  - or
  - Machine interpretation of definite STEMI
    - **** acute mi****
- No contraindications to acute catheterization
  - Active severe bleeding
  - Patient inappropriate for procedure (patient or family refusal, DNR, severe dementia)
- Emergency physician activates Primary PCI hospital as soon as STEMI is identified using term "code STEMI"
- Pre-arranged critical care transport or EMS dispatch notified of "code STEMI" for 911 transfer
- Aspirin 325 mg
- Heparin bolus 60 u/kg, no drip
- Limit continuous infusions
- Fax records while patient in transport

EMS lab activation protocol

- Symptoms of acute coronary syndrome greater than 15 minutes - less than 12 hours.
- ECG diagnosis
  - ST segment elevation in two contiguous leads
  - or
  - Machine interpretation of definite STEMI
    - **** acute mi****
- No contraindications to acute catheterization
  - Active severe bleeding
  - Patient inappropriate for procedure (patient or family refusal, DNR, severe dementia)
- Trained paramedic activates Primary PCI hospital as soon as STEMI is identified using term "code STEMI"
- Aspirin 325 mg

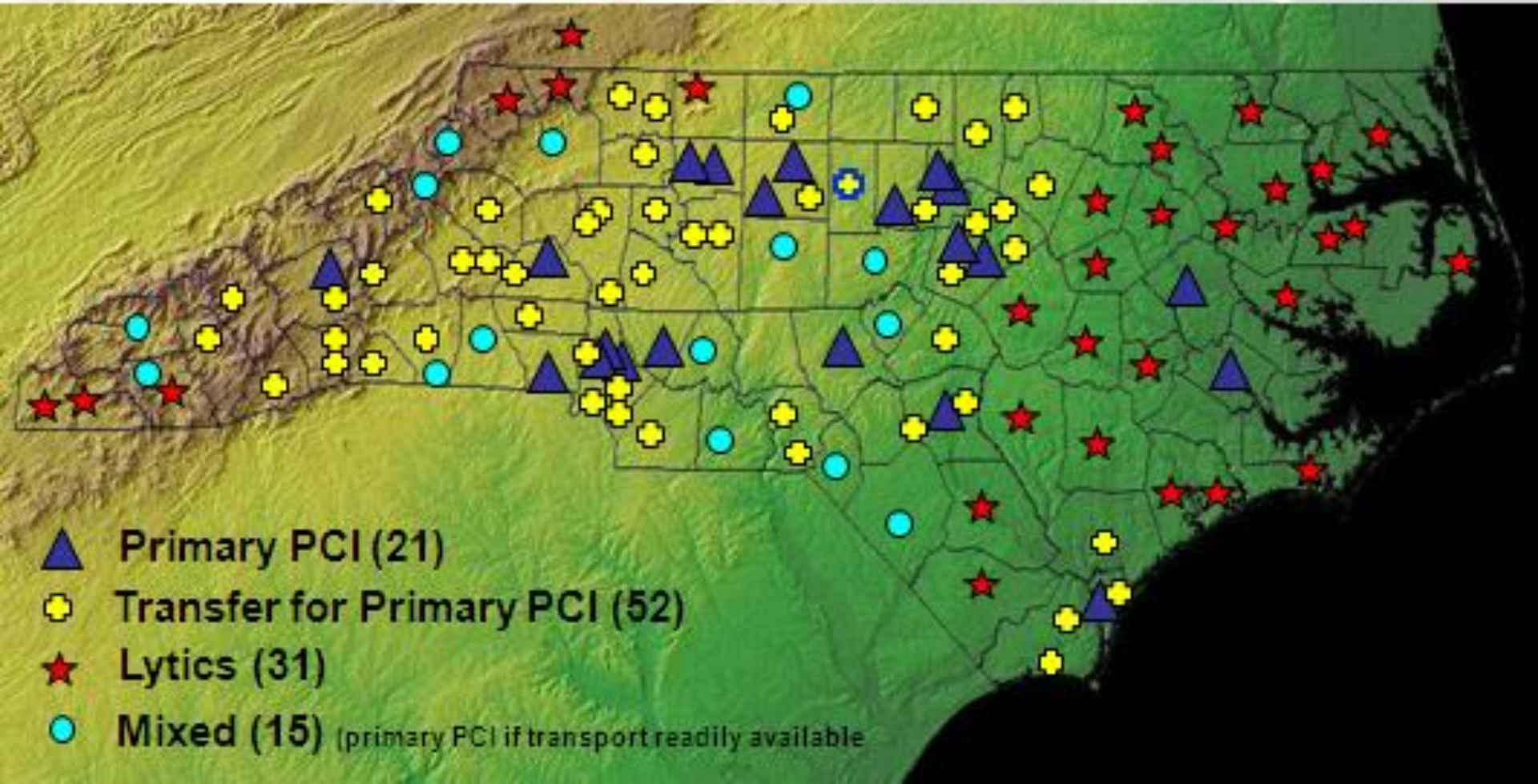
Available @ https://cee.dcri.duke.edu/regional-systems/ACCELERATOR%20OPs%20Manual%20Final.pdf/view

Newsletter launch https://www.dcri.org/cee/stemi/ml-stemi-accelerator-reaches-half-way-point



If you don’t measure it, you can’t improve it

RACE Hospitals by PCI and Reperfusion Designation



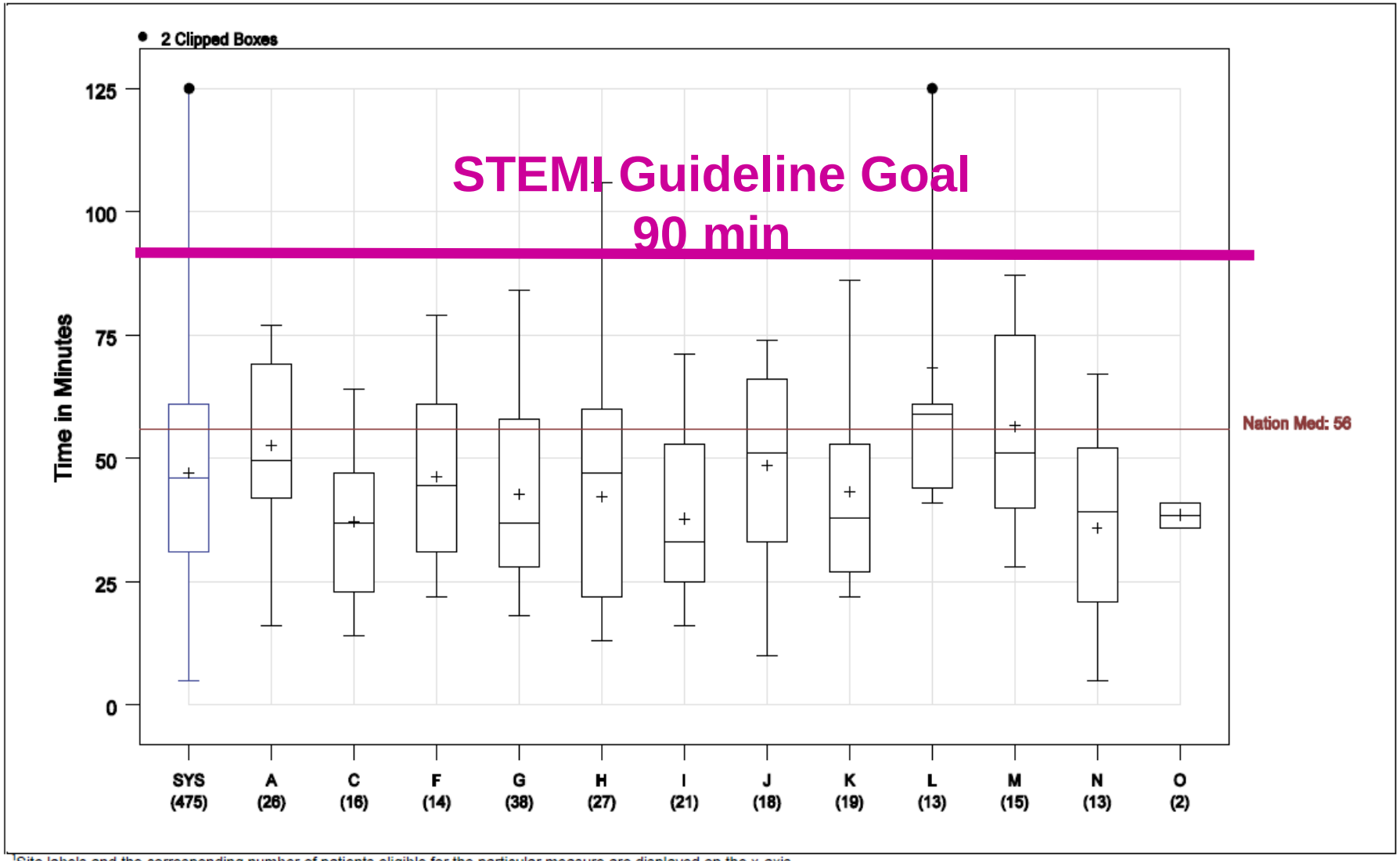
0017: 2013 Q1

Patient Characteristics
Direct Presentation vs. Transfer In

	Direct Presentation				Transfer In			
	System				System			
	Last Qtr	Last 12 mo	State	Nation	Last Qtr	Last 12 mo	State	Nation
Number of STEMI Patients	810	3,098	3,098	40,127	443	1,772	1,772	16,781
Patient Demographics								
Age (median years)	61.0	60.0	60.0	61.0	60.0	60.0	60.0	60.0
Female	32%	31%	31%	30%	33%	31%	31%	29%
Non-White	19%	18%	18%	15%	19%	18%	18%	11%
Hispanic Ethnicity	1%	2%	2%	6%	1%	1%	1%	4%
Diagnosis								
First ECG obtained Pre-Hospital (EMS Arr.)	89%	91%	91%	70%	50%	49%	49%	32%
STEMI Noted on first ECG	84%	85%	85%	86%	80%	80%	80%	86%
Mode of Arrival (to First Facility)								
POV	25%	26%	26%	37%	75%	71%	71%	71%
EMS (Ambulance)	72%	71%	71%	60%	25%	29%	29%	28%
Reperfusion								
Contraindicated to reperfusion	4%	5%	5%	6%	11%	8%	8%	7%
Eligible for reperfusion	96%	95%	95%	93%	89%	92%	92%	93%
Treated	89%	89%	89%	90%	92%	92%	92%	91%
Untreated	11%	11%	11%	10%	8%	8%	8%	9%
Median Time to Reperfusion								
Primary PCI	46.0	46.0	46.0	57.0	96.0	97.0	97.0	106.0
Fibrinolytic	-	38.0	38.0	46.0	31.5	28.0	28.0	31.0
In-hospital Clinical Events (Exc. Trans-Out)								
Reinfarction	0.6%	0.5%	0.5%	0.8%	1.1%	0.5%	0.5%	0.7%
Cardiogenic shock	5.1%	5.8%	5.8%	7.2%	5.0%	6.1%	6.1%	6.7%
Heart Failure	2.8%	3.6%	3.6%	5.7%	4.8%	4.4%	4.4%	5.6%
CVA/Stroke	0.4%	0.7%	0.7%	0.7%	1.1%	0.9%	0.9%	0.9%
Hemorrhagic stroke (Among CVA pts)	0.0%	4.5%	4.5%	15.6%	20.0%	43.8%	43.8%	25.5%
Suspected Bleeding Event	3.3%	2.5%	2.5%	3.6%	3.6%	3.4%	3.4%	3.9%
RBC/Whole Blood Cell Transfusion	3.9%	4.0%	4.0%	4.3%	4.1%	4.9%	4.9%	4.4%
Any of above events	14.8%	15.1%	15.1%	17.5%	17.2%	16.4%	16.4%	16.2%

0017: 2013 Q1

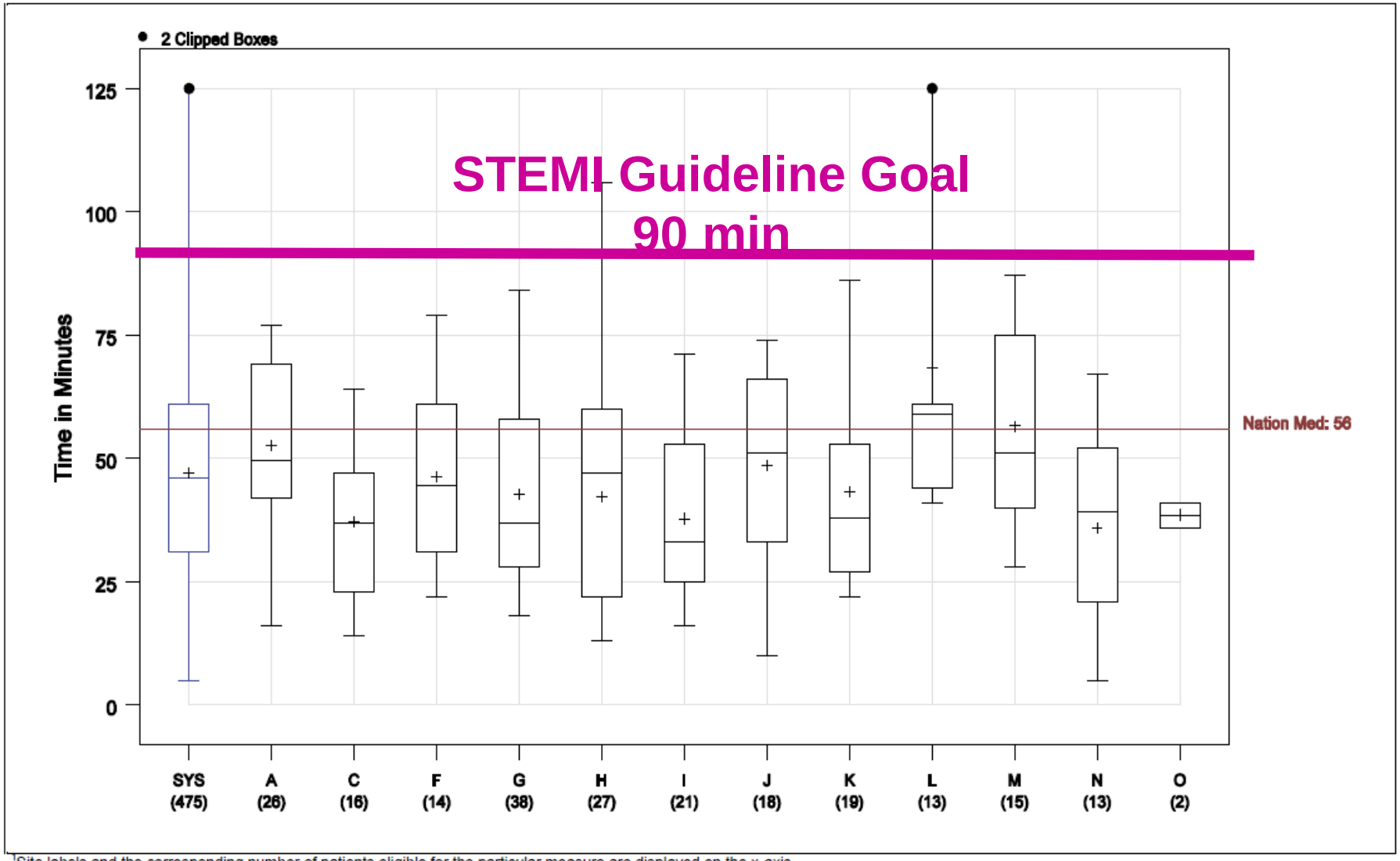
Arrival to Device Activation
Distribution of Times (minutes)
Direct Presentaion, All Arrival Modes



[1]Site labels and the corresponding number of patients eligible for the particular measure are displayed on the x-axis
[2]Boxes are not displayed when there are no eligible patients in the time frame.

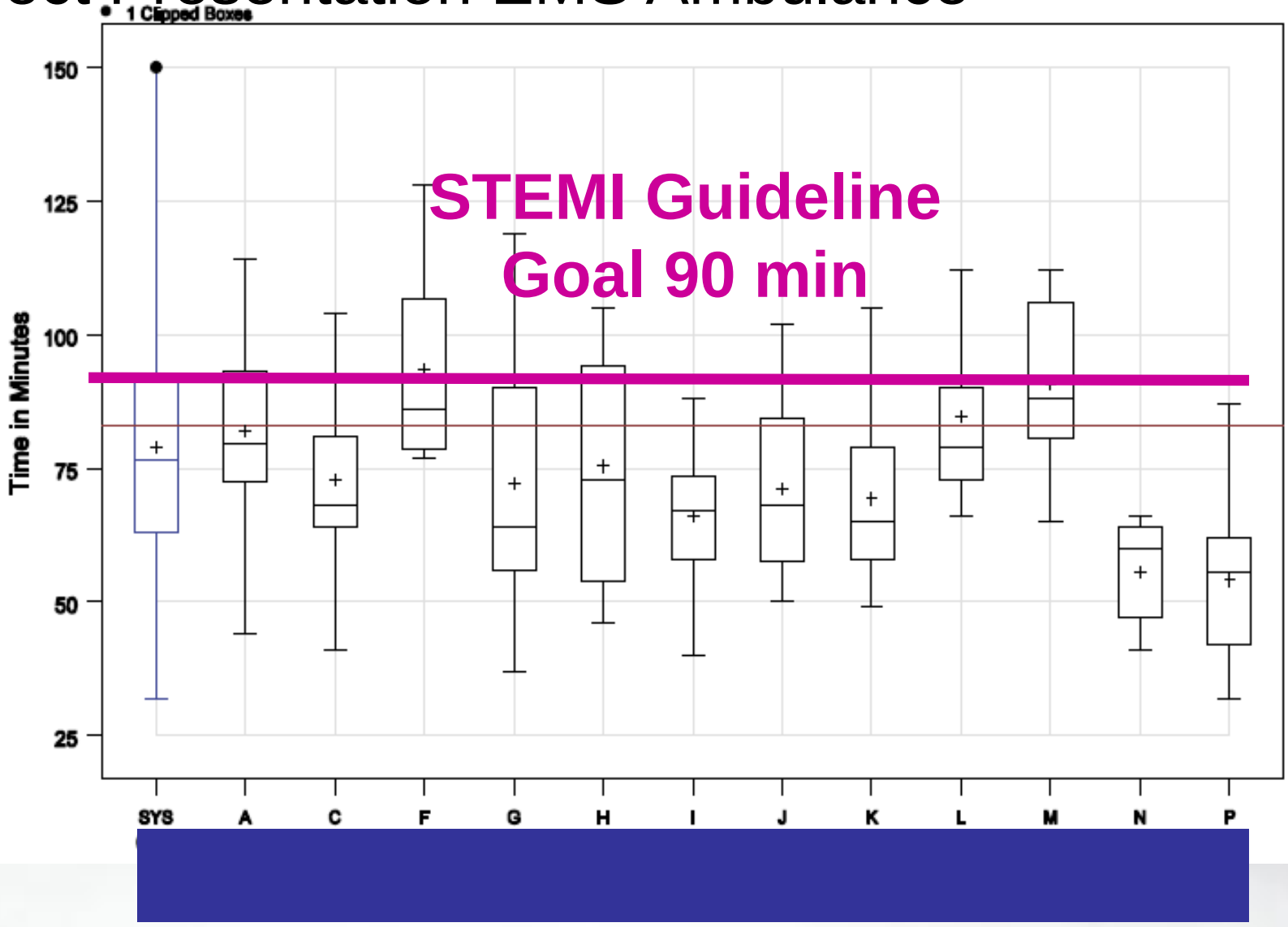
0017: 2013 Q1

Arrival to Device Activation
Distribution of Times (minutes)
Direct Presentaion, All Arrival Modes



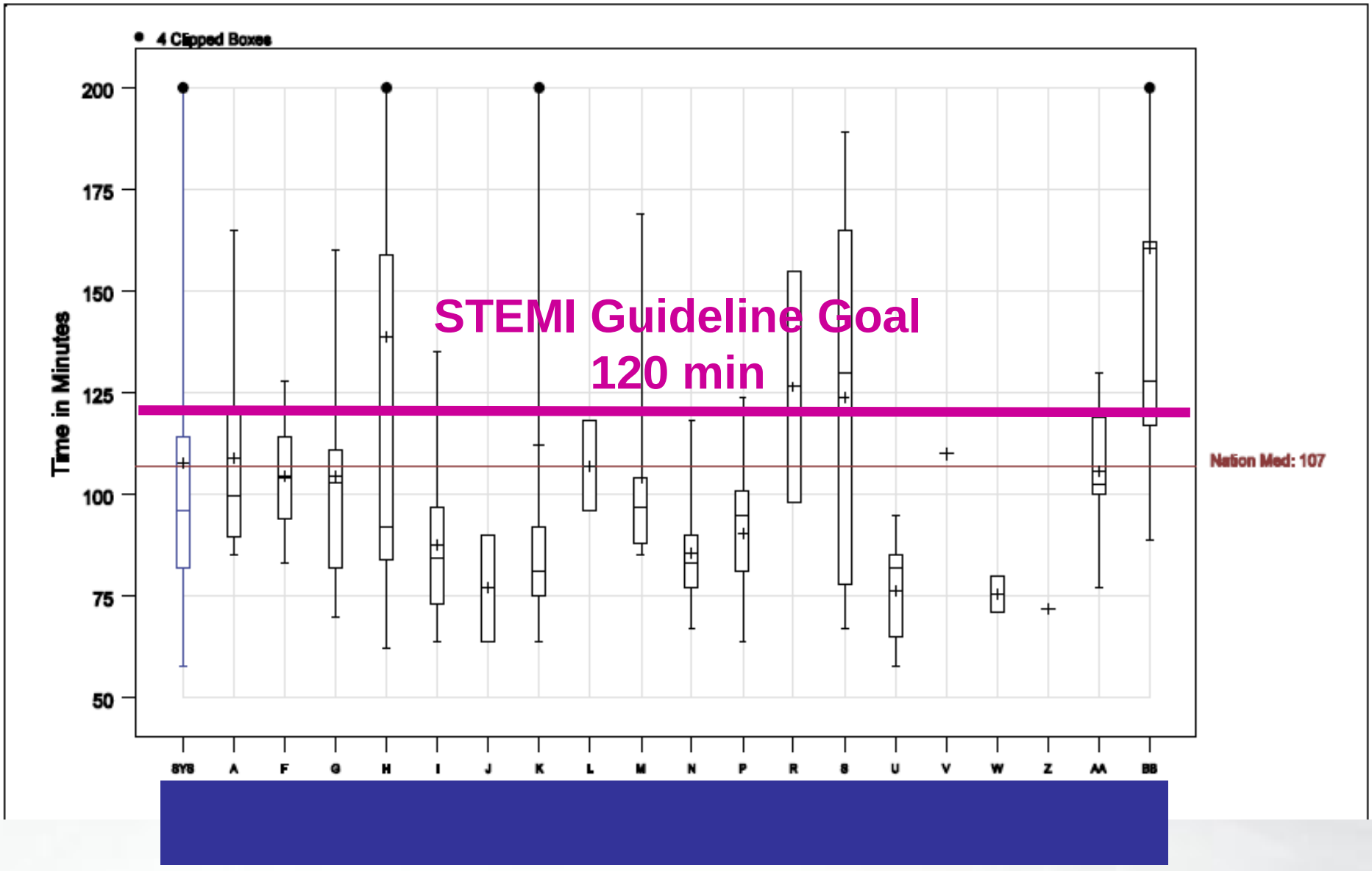
[1]Site labels and the corresponding number of patients eligible for the particular measure are displayed on the x-axis
[2]Boxes are not displayed when there are no eligible patients in the time frame.

FMC to Device
Direct Presentation EMS Ambulance

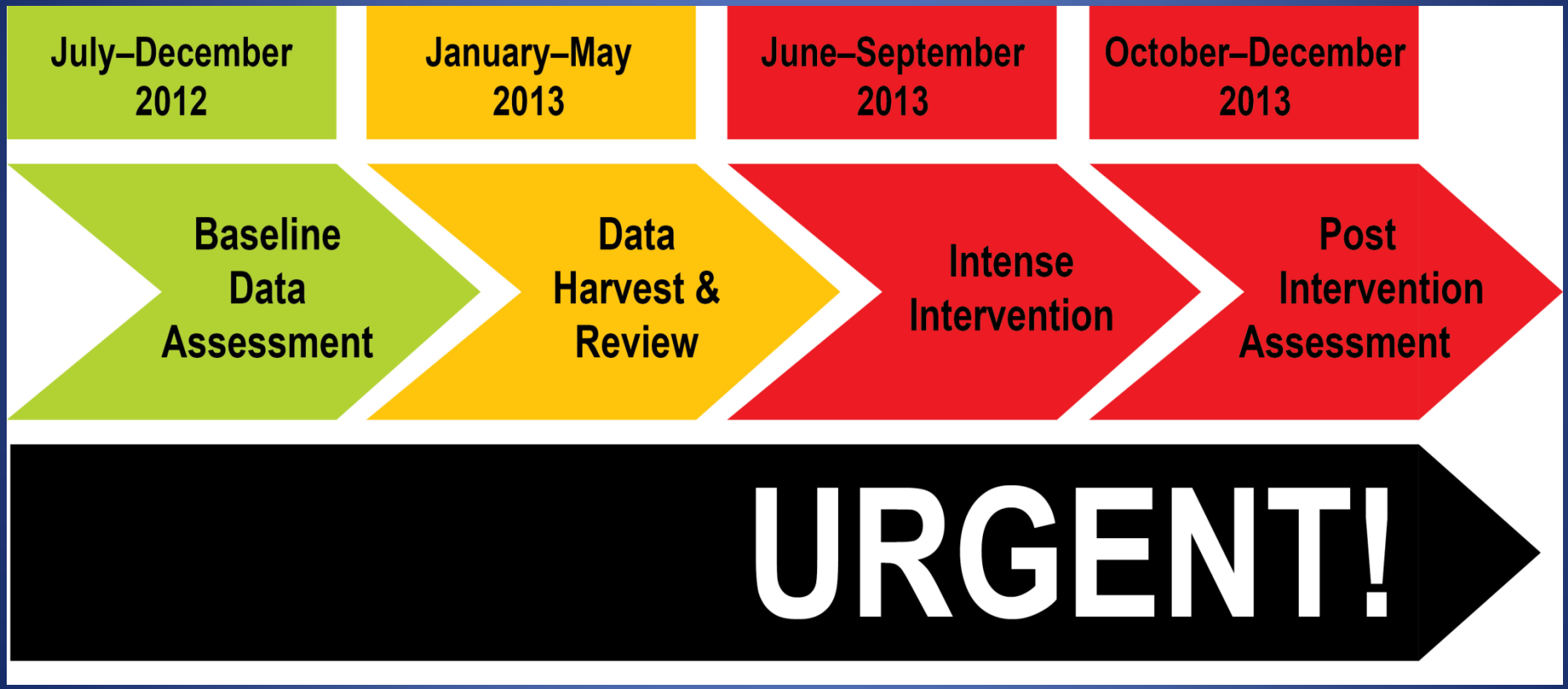


First Door to Device/Transfer

Arrival at Fi ce Activation
Distrit inutes)
Transfer in for Primary PCI

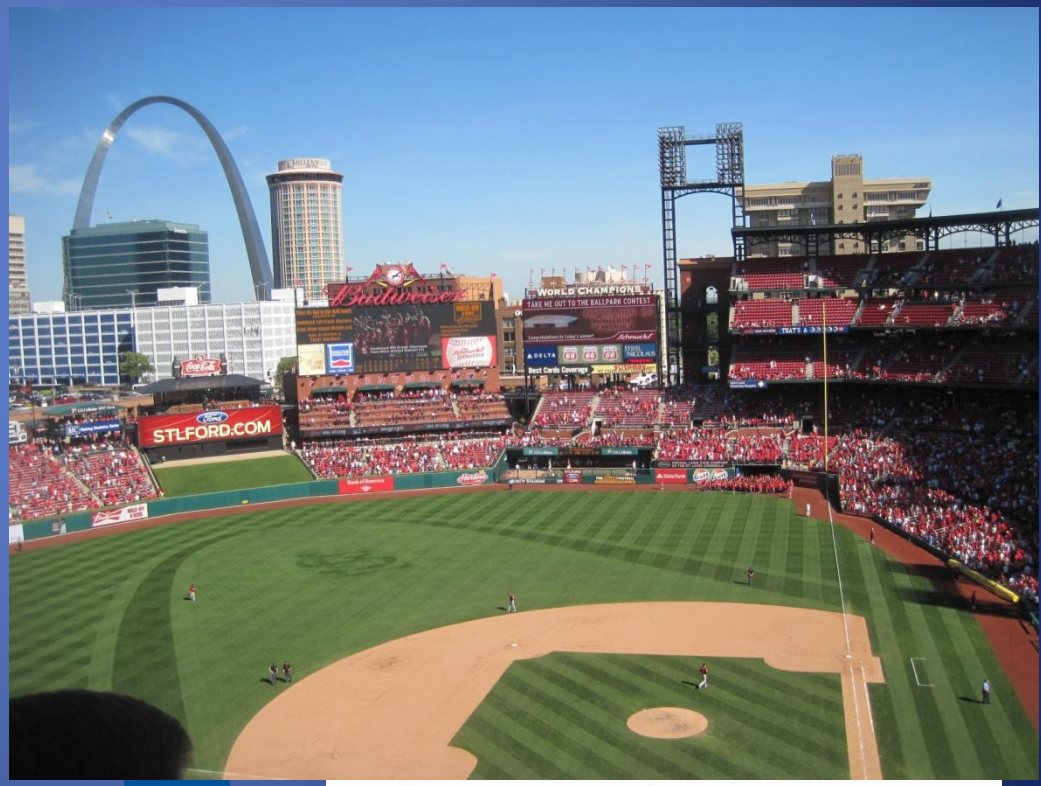


Study Timeline & Deliverables

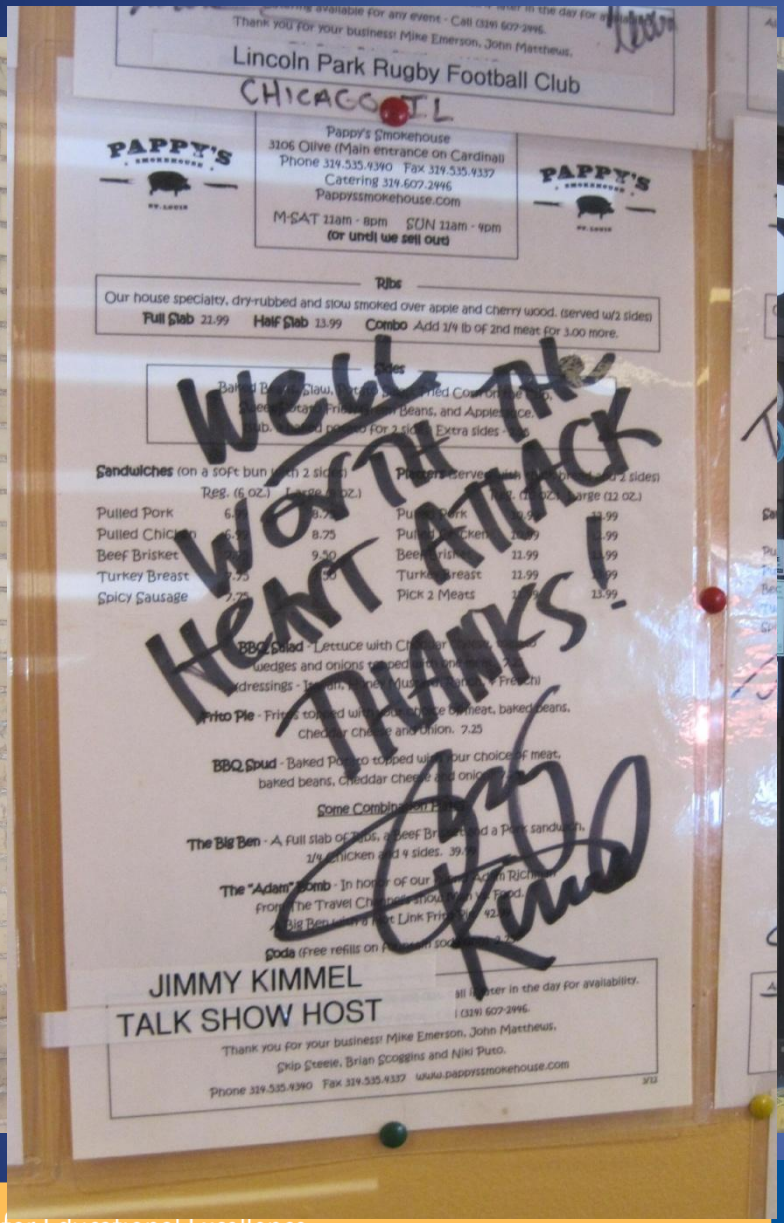


Every Region Has a “Story”

- A Beginning…….2011




CBS
Physicians
Researchers
Educators
SLUCare
Saint Louis University
1296



American Heart Association®

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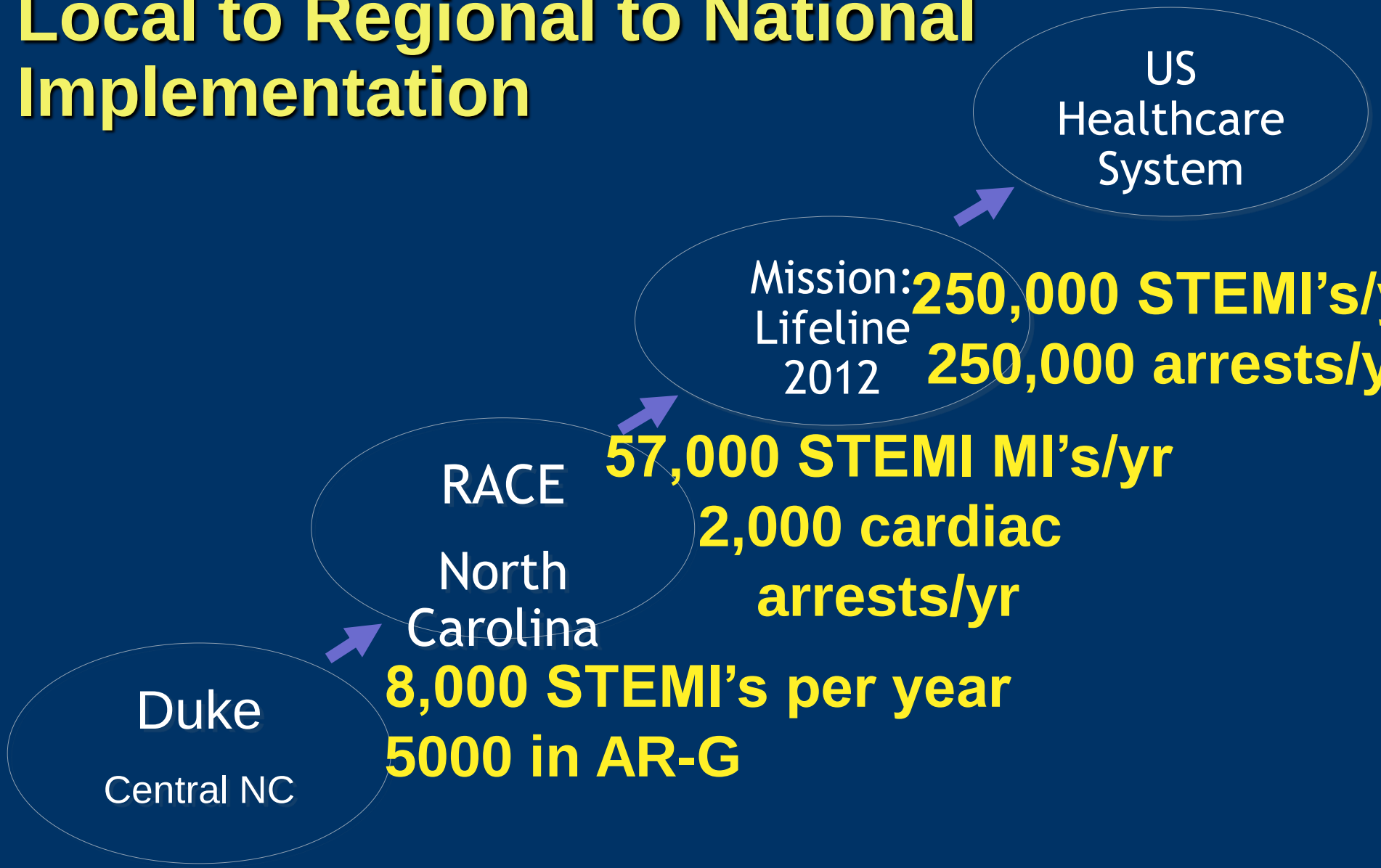
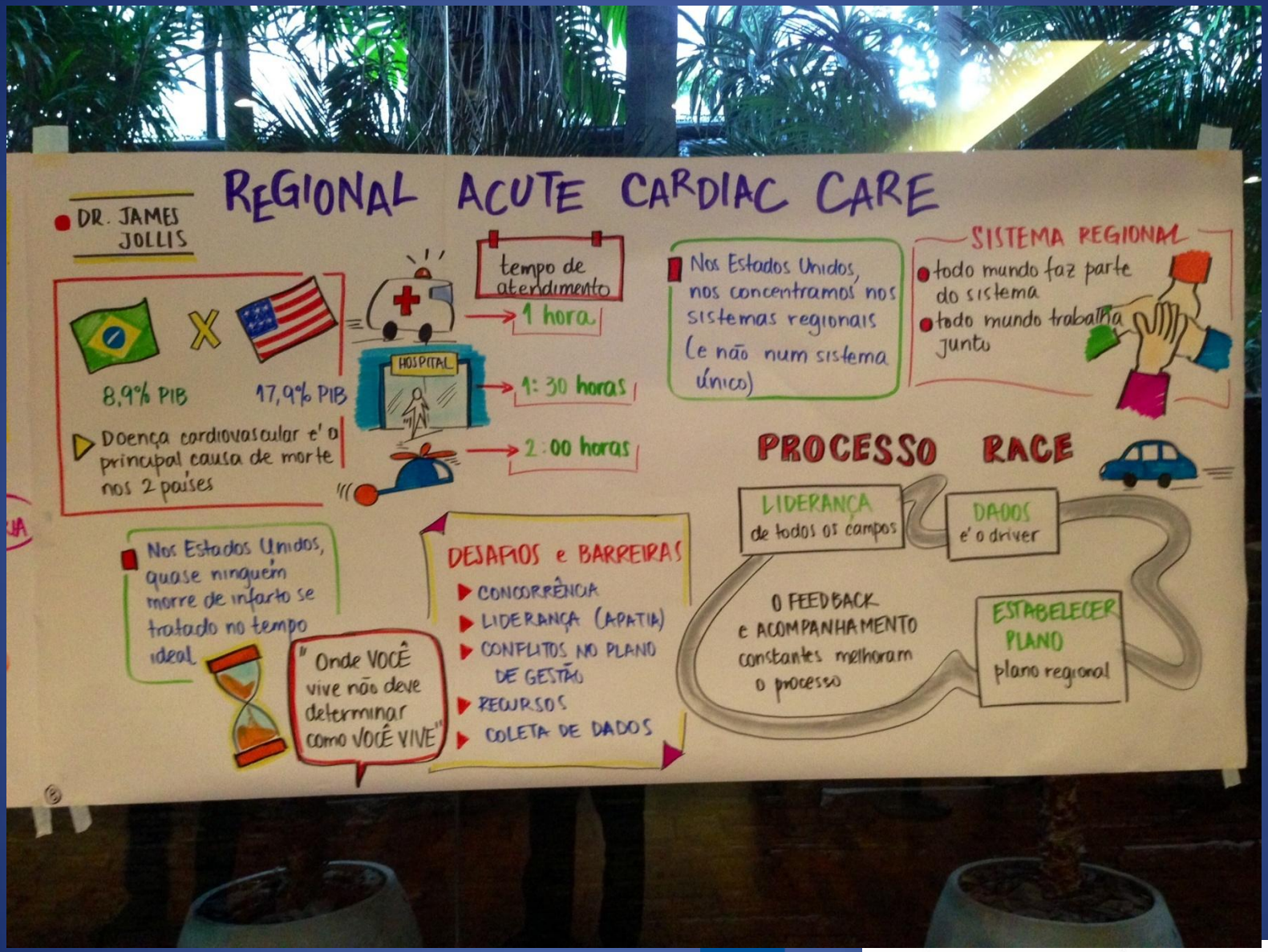
Local to Regional to National Implementation




RESERVED

STEMI SYSTEMS ACCELERATOR Intervention

- Using national level system faculty and local AHA staff to broker competitive entities to regionalize STEMI care for a community.
- Success based on regional local leadership owning the program.
- Unbiased staff to recruit all hospitals to join centralized database.
- Regional Intervention Day
  - CME/CNE event
- Data- Baseline, Quarterly for 1 year, Post Intervention
- Quarterly meetings to share best practices, data review across the region and identify strategies to improve process


REGIONAL ACUTE CARDIAC CARE
DR. JAMES JOLLIS
8,9% PIB
X
17,9% PIB
Doença cardiovascular é a principal causa de morte nos 2 países
tempo de atendimento
1 hora
HOSPITAL
1: 30 horas
2:00 horas
Nos Estados Unidos, nos concentramos nos sistemas regionais (e não num sistema único)
SISTEMA REGIONAL
todo mundo faz parte do sistema
todo mundo trabalha junto
PROCESSO RACE
LIDERANÇA de todos os campos
DADOS é o driver
O FEEDBACK E ACOMPANHAMENTO constantes melhoram o processo
ESTABELECER PLANO plano regional
Nos Estados Unidos, quase ninguém morre de infarto se tratado no tempo ideal
"Onde VOCÊ vive não deve determinar como VOCÊ VIVE"
DESAFIOS e BARREIRAS
CONCORRÊNCIA
LIDERANÇA (APATIA)
CONFLITOS NO PLANO DE GESTÃO
RECURSOS
COLETA DE DADOS

The Center for Educational Excellence

Promoting excellence in clinical care and patient safety around the world

American Heart Association®

MISSION: LIFELINE®

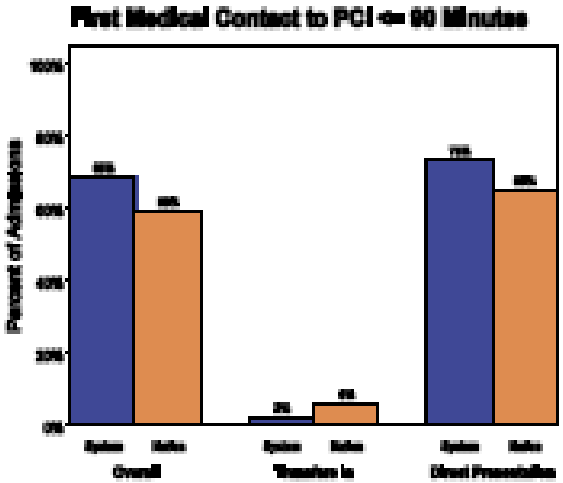
NORTH CAROLINA

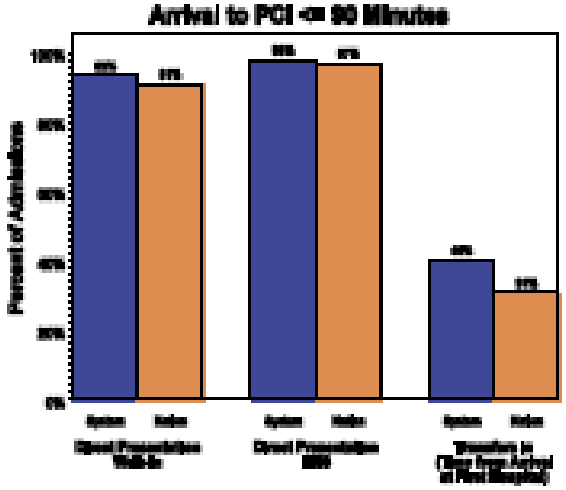
0017: 2013 Q2

Patient Characteristics
Direct Presentation vs. Transfer In

	Direct Presentation				Transfer In			
	System				System			
	Last Qtr	Last 12 mo	State	Nation	Last Qtr	Last 12 mo	State	Nation
Number of STEMI Patients	820	3,135	3,166	41,935	405	1,694	1,694	17,231
Patient Demographics								
Age (median years)	60.0	60.0	60.0	61.0	60.0	60.0	60.0	60.0
Female	27%	30%	30%	30%	30%	31%	31%	29%
Non-White	16%	17%	17%	15%	20%	19%	19%	11%
Hispanic Ethnicity	1%	2%	2%	7%	0%	1%	1%	5%
Diagnosis								
First ECG obtained Pre-Hospital (EMS Arr.)	91%	91%	91%	71%	46%	47%	47%	32%
STEMI Noted on first ECG	84%	85%	85%	86%	77%	79%	79%	86%
Mode of Arrival (to First Facility)								
POV	25%	26%	26%	36%	73%	72%	72%	72%
EMS (Ambulance)	71%	71%	71%	61%	27%	28%	28%	27%
Reperfusion								
Contraindicated to reperfusion	4%	4%	5%	6%	7%	8%	8%	7%
Eligible for reperfusion	95%	95%	95%	94%	93%	92%	92%	93%
Treated	89%	89%	88%	90%	92%	92%	92%	91%
Untreated	11%	11%	12%	10%	8%	8%	8%	9%
Median Time to Reperfusion								
Primary PCI	44.0	46.0	46.0	57.0	95.0	97.0	97.0	106.0
Fibrinolytic	164.5	94.5	94.5	45.5	28.0	28.0	28.0	31.0
In-hospital Clinical Events (Exc. Trans-Out)								
Reinfarction	0.5%	0.4%	0.4%	0.9%	0.3%	0.5%	0.5%	0.7%
Cardiogenic shock	4.1%	5.1%	5.1%	7.0%	4.5%	5.7%	5.7%	6.5%
Heart Failure	4.1%	3.6%	3.6%	5.5%	2.8%	3.9%	3.9%	5.3%
CVA/Stroke	0.9%	0.7%	0.7%	0.7%	0.0%	0.8%	0.8%	0.9%
Hemorrhagic stroke (Among CVA pts)	0.0%	4.8%	4.8%	15.8%	-	46.2%	46.2%	30.2%
Suspected Bleeding Event	2.8%	2.6%	2.6%	3.7%	3.5%	3.3%	3.3%	3.7%
RBC/Whole Blood Cell Transfusion	3.6%	3.8%	3.8%	4.2%	4.8%	4.8%	4.8%	4.1%
Any of above events	14.4%	14.8%	14.8%	17.3%	14.9%	16.1%	16.1%	15.9%

	System		State	Nation
	Last Qtr	Last 12 mo		
Median Time from Arrival to Cath Lab Arrival (mins)				
Direct Presentation	29.0	30.0	30.0	38.0
Arrived by EMS	25.0	25.0	25.0	32.0
Arrived by POV	48.5	47.0	47.0	47.0
Transfers In				
From Arrival at First Facility	88.0	90.0	90.0	98.0
From Arrival at Receiving Facility	5.0	8.0	8.0	10.0
Median Time from Arrival to Primary PCI (mins)				
Direct Presentation	44.0	46.0	46.0	57.0
Arrived by EMS	39.0	40.0	40.0	50.0
Arrived by POV	67.5	65.0	65.0	66.0
Transfers In				
From Arrival at First Facility	95.0	97.0	97.0	106.0
From Arrival at Receiving Facility	24.0	26.0	26.0	27.0
Median Time from First Medical Contact to Primary PCI (mins)[1]	77.0	77.0	77.0	82.0
Median Time from Cath Lab Arrival to First Device Activation (mins)	22.0	23.0	23.0	22.0
Reasons Reperfusion Not Indicated				
No ST elevation/LBBB	0%	0%	0%	2%
ST elevation resolved	15%	14%	15%	8%
MI Diagnosis Unclear	6%	5%	5%	5%
MI Symptoms Onset > 12 hrs	16%	26%	25%	14%
Chest pain resolved	21%	17%	17%	9%
No chest pain	4%	4%	4%	3%
Other	34%	28%	28%	31%





FOOTNOTES:

[1] Among direct presenters arriving via EMS

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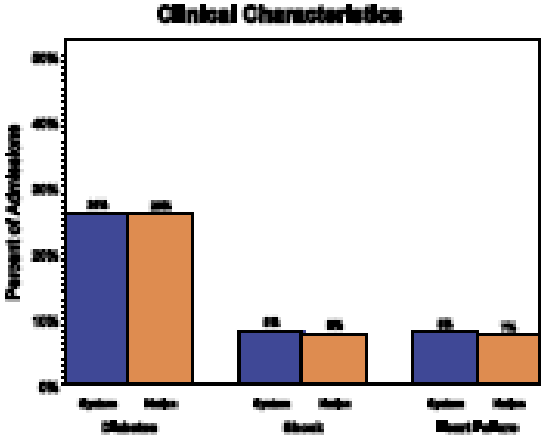
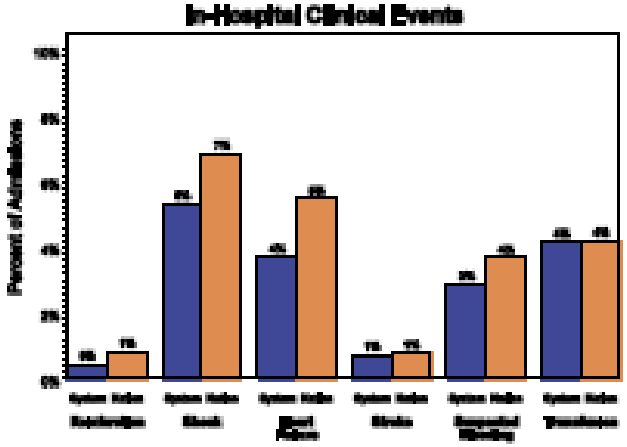
Clinical Characteristics and In-Hospital Patient Outcomes

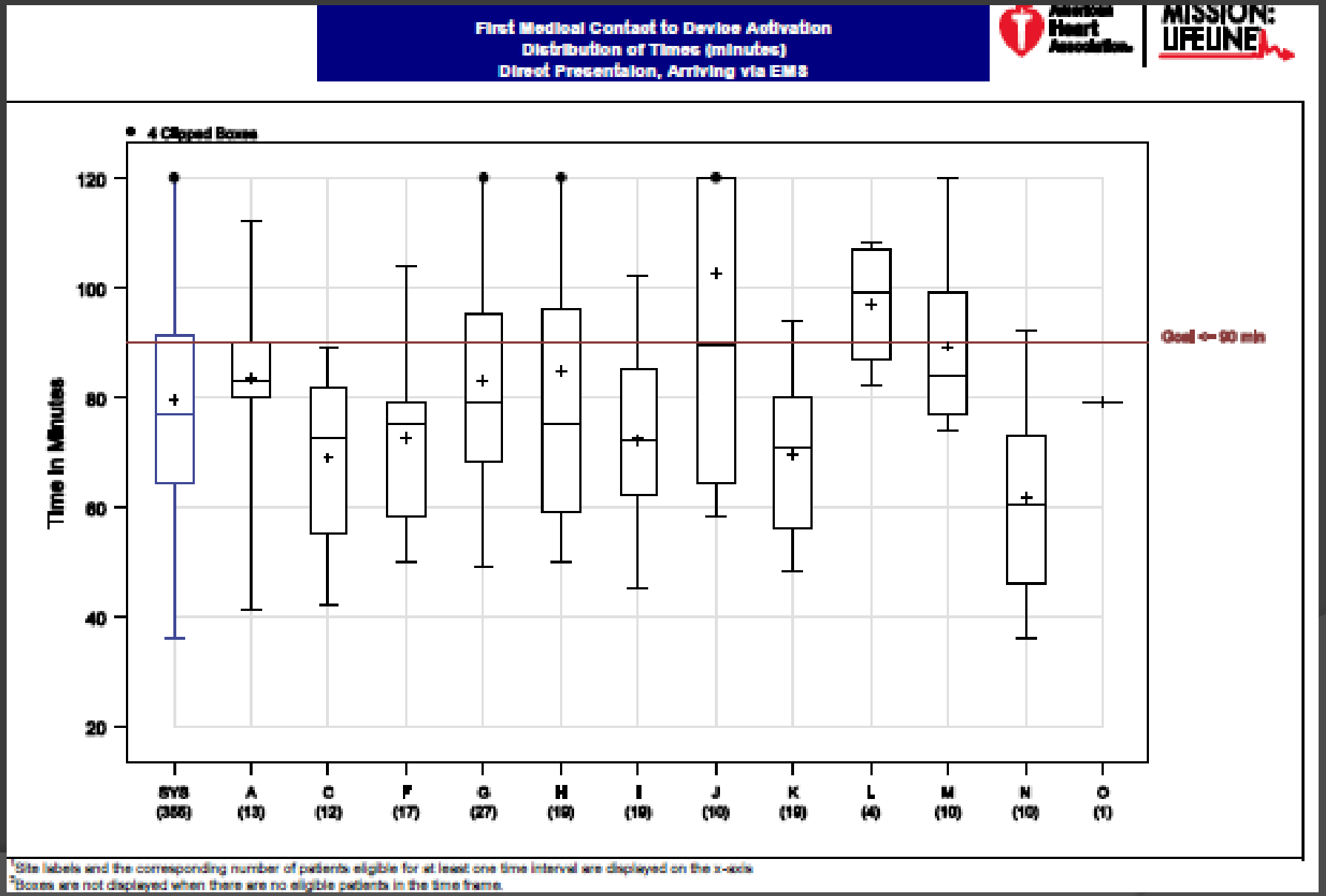
	System		State[1]	Nation[2]
	Last Qtr	Last 12 mo		
Clinical Characteristics				
History of Diabetes	26%	26%	26%	26%
Cardiogenic Shock on Presentation	8%	8%	8%	8%
Heart Failure on Presentation	7%	8%	8%	7%
In-hospital Mortality[3]				
Unadjusted				
Observed Mortality rate	5.6%	6.0%	6.0%	6.5%
Lower 95% confidence limit	4.3%	5.3%	5.3%	6.3%
Upper 95% confidence limit	6.9%	6.6%	6.6%	6.7%
Among cardiac arrest patients[4]	32.3%	31.6%	31.6%	32.0%
Among non-cardiac arrest patients[4]	3.4%	3.9%	3.9%	4.3%
Risk-adjusted death[5]				
Expected Mortality rate	-	7.2%	7.2%	6.9%
Observed/Expected Ratio	-	0.83	0.83	0.95
Lower 95% confidence limit	-	0.75	0.75	0.92
Upper 95% confidence limit	-	0.91	0.91	0.98
In-hospital Clinical Events[3]				
ReInfarction	0.4%	0.4%	0.4%	0.6%
Cardiogenic shock	4.3%	5.3%	5.3%	6.9%
Heart Failure	3.7%	3.7%	3.7%	5.5%
CVA/Stroke	0.6%	0.7%	0.7%	0.8%
Hemorrhagic stroke	0.0%	20.6%	20.6%	20.7%
Suspected Bleeding Event	3.0%	2.9%	2.9%	3.7%
RBC/Whole Blood Cell Transfusion	4.0%	4.2%	4.2%	4.2%
Any of above events	14.5%	15.2%	15.3%	16.6%
Median Length of Stay (days)[6]	3.0	3.0	3.0	3.0



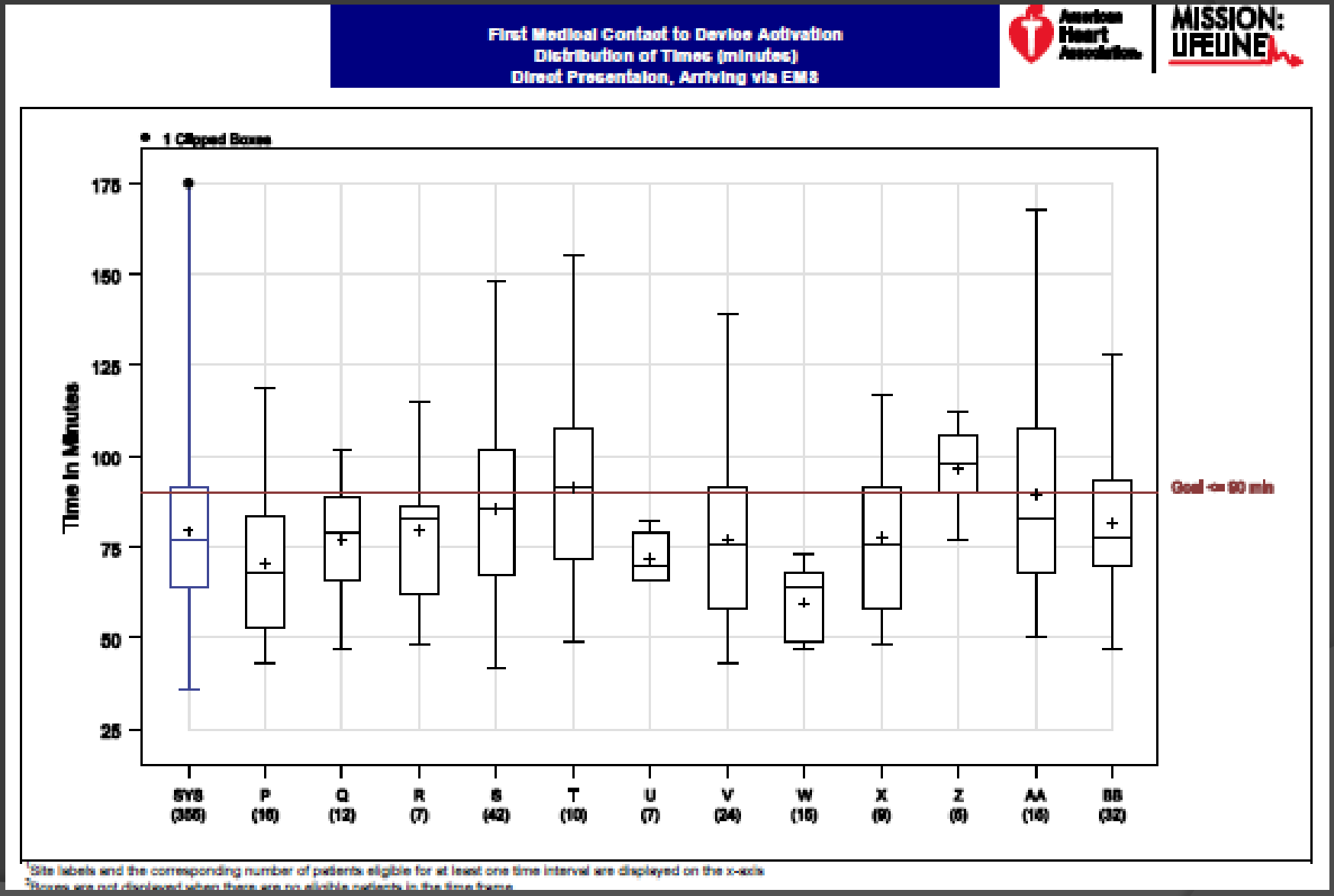


[1] Among all hospitals in system's state; reported for states with 6+ sites
[2] Among all hospitals in Mission: Lifeline
[3] Excluding transfers out
[4] From new data version (April 1, 2011) only
[5] Refer to the Interpretation Manual for information on risk-adjustment methodology
[6] Excluding transfers in and transfers out

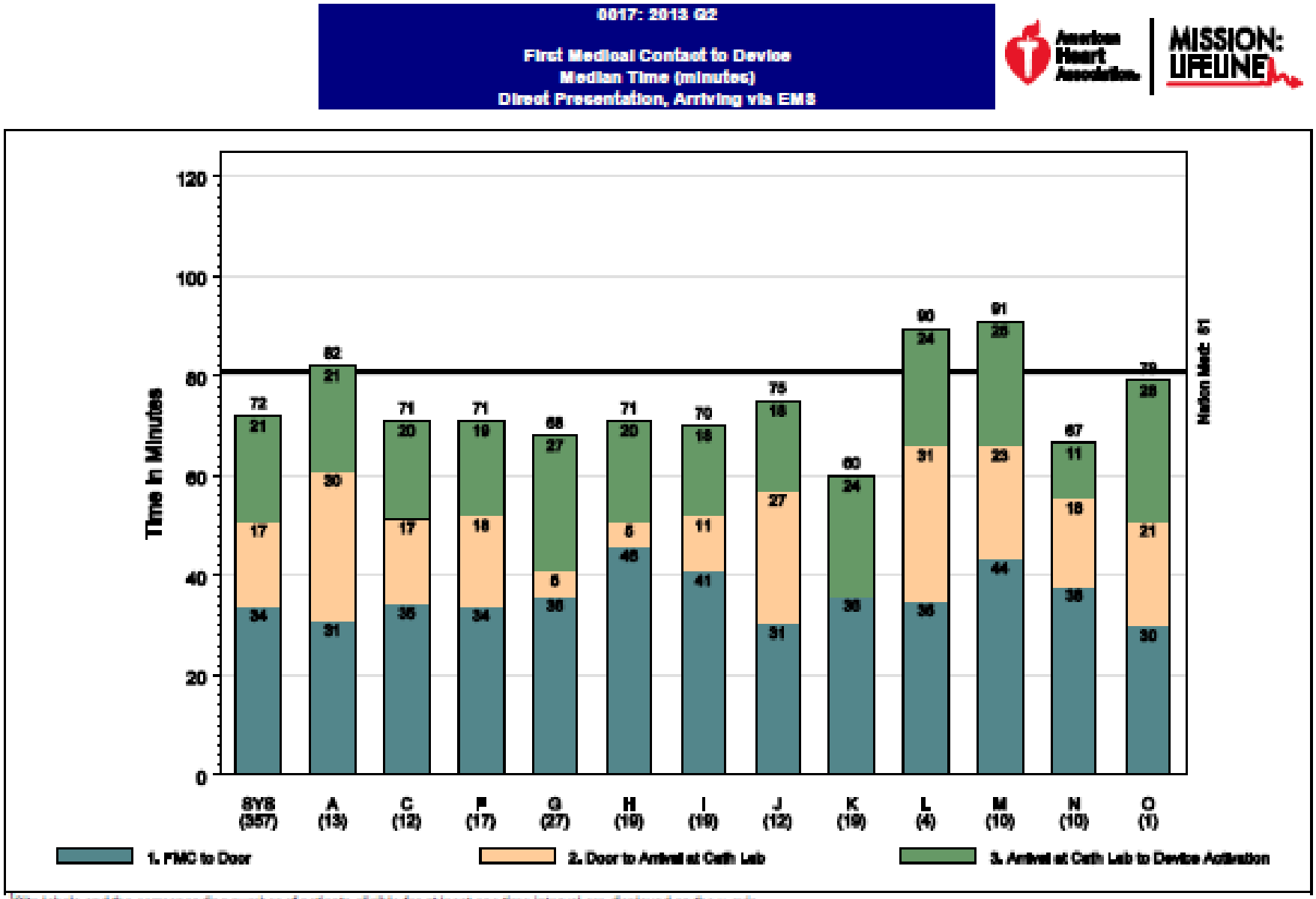
FMC2B


First Medical Contact to Device Activation
Distribution of Times (minutes)
Direct Presentation, Arriving via EMS
American Heart Association.
MISSION: LIFELINE
4 Clipped Boxes
Time In Minutes
120
100
80
60
40
20
Goal <= 90 min
SYS (356)
A (13)
C (12)
F (17)
G (27)
H (19)
I (19)
J (19)
K (19)
L (4)
M (10)
N (10)
O (1)
[1]Site labels and the corresponding number of patients eligible for at least one time interval are displayed on the x-axis
[2]Boxes are not displayed when there are no eligible patients in the time frame.

FMC2B

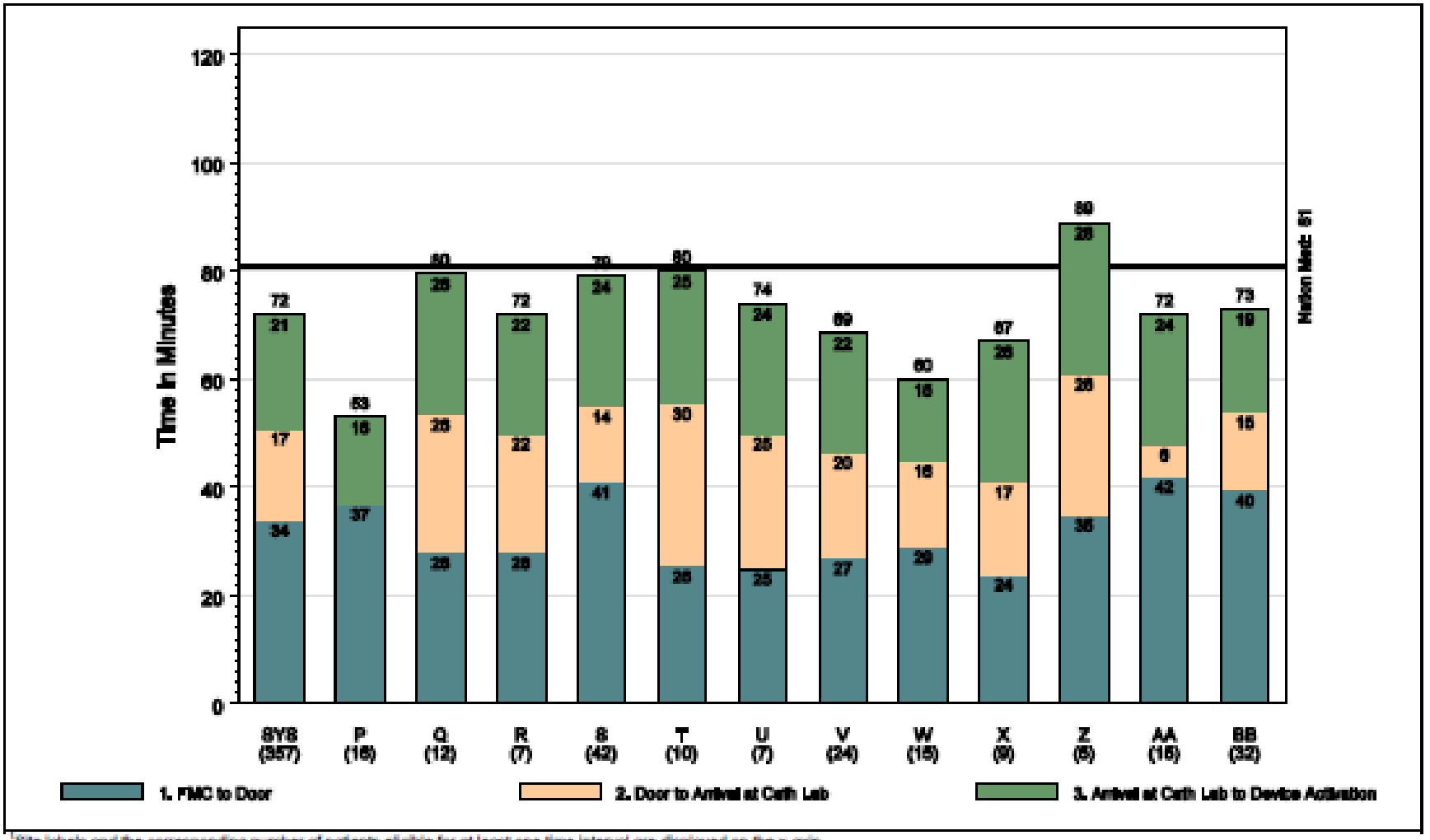

First Medical Contact to Device Activation
Distribution of Times (minutes)
Direct Presentation, Arriving via EMS
American Heart Association.
MISSION: LIFELINE
1 Clipped Boxes
Time in Minutes
175
150
125
100
75
50
25
Goal <= 90 min
SYS (355)
P (16)
Q (12)
R (7)
S (42)
T (10)
U (7)
V (24)
W (16)
X (9)
Z (6)
AA (16)
BB (32)
[1]Site labels and the corresponding number of patients eligible for at least one time interval are displayed on the x-axis
[2]Boxes are not displayed when there are no eligible patients in the time frame

FMC2B



[1]Site labels and the corresponding number of patients eligible for at least one time interval are displayed on the x-axis

FMC2B



[1]Site labels and the corresponding number of patients eligible for at least one time interval are displayed on the x-axis

[2]Bars are not displayed when there are no patients eligible for at least one time interval. Additionally, specific time intervals without any eligible patients are not plotted.

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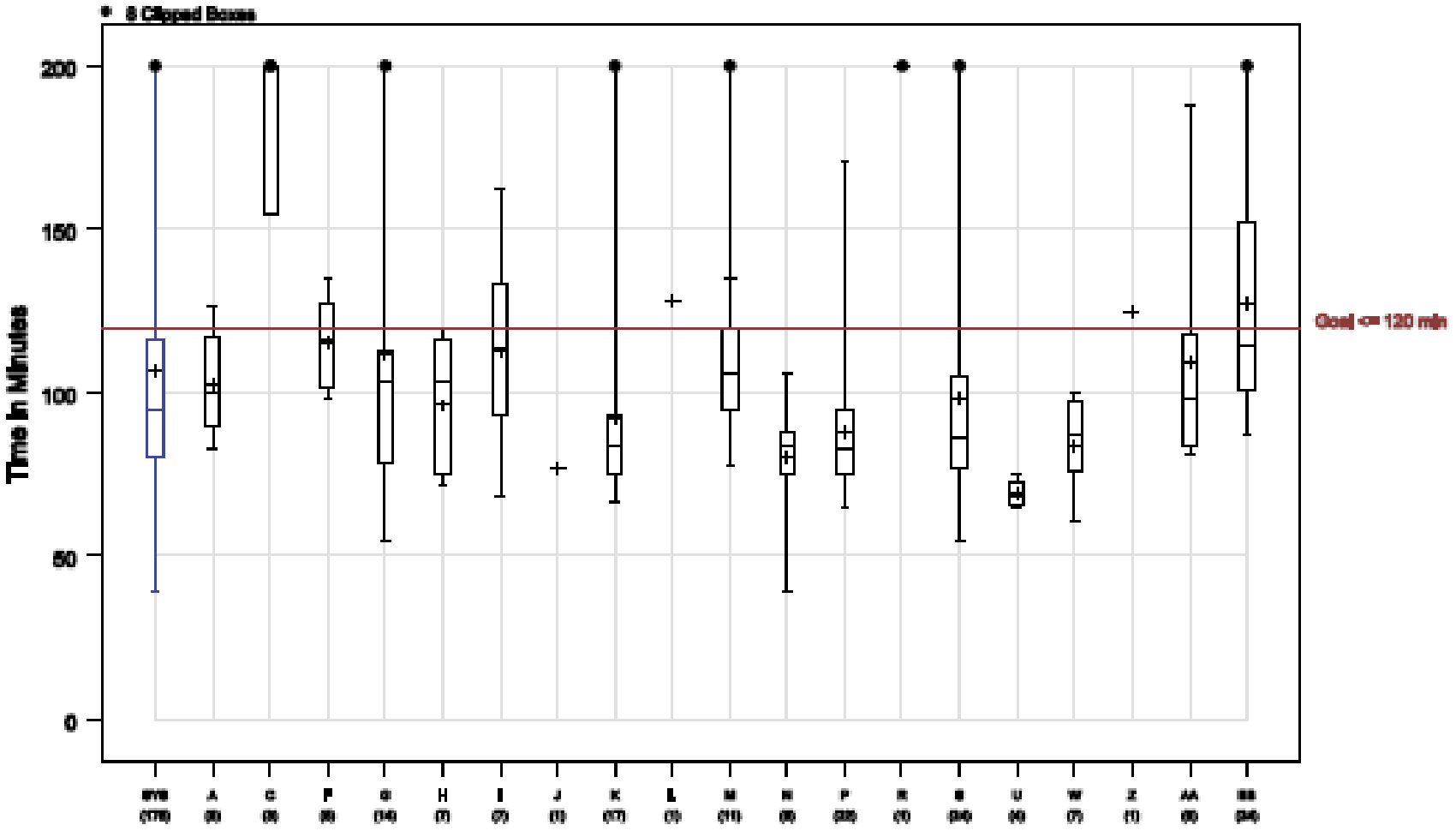
Arrival at First Facility to Device Activation
Distribution of Times (minutes)
Transfer In for Primary PCI



[1]Site labels and the corresponding number of patients eligible for at least one time interval are displayed on the x-axis
[2]Boxes are not displayed when there are no eligible patients in the time frame.

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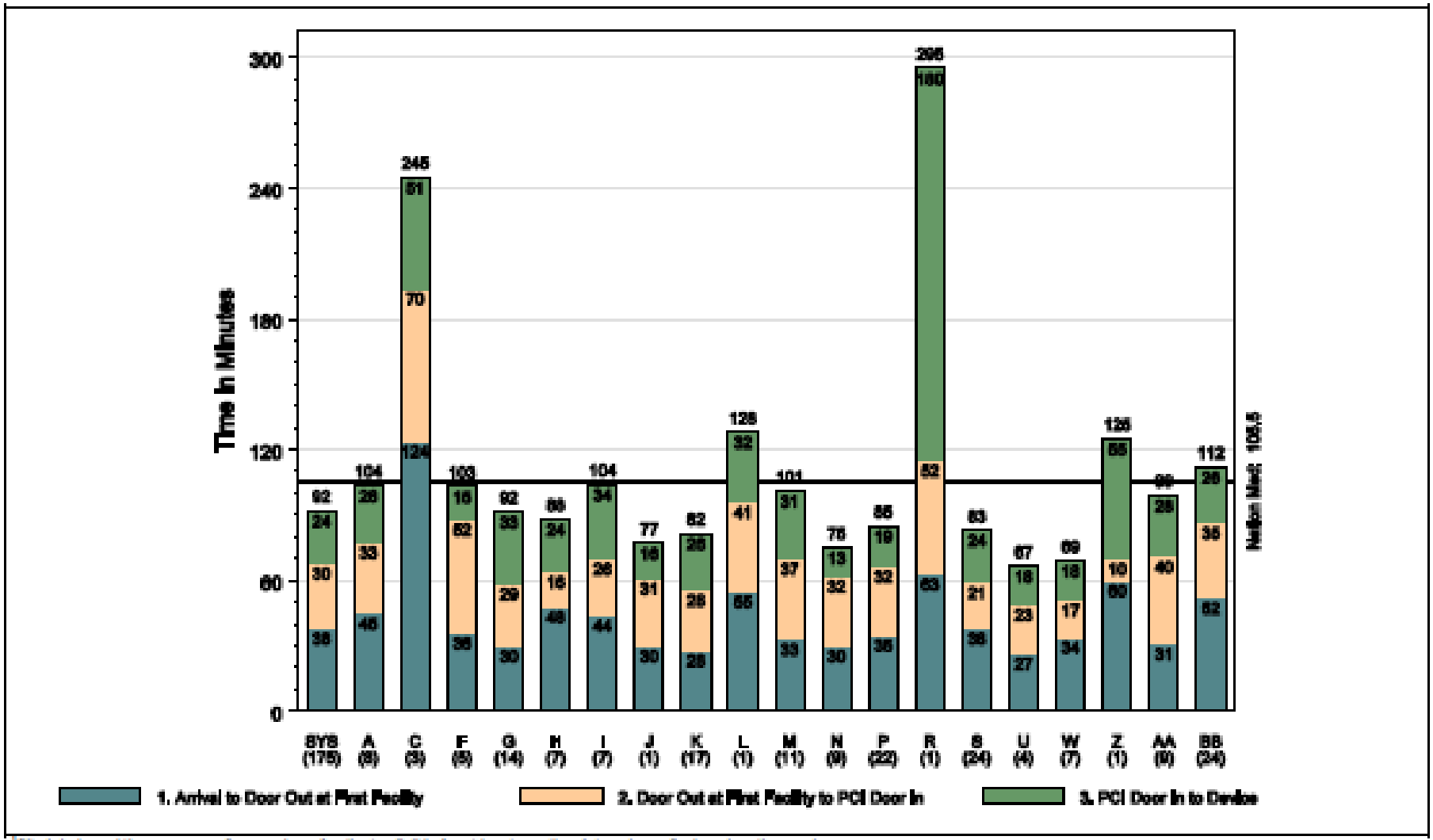
Arrival at First Facility to Device
Median Time (minutes)
Transfer In for Primary PCI



[1]Site labels and the corresponding number of patients eligible for at least one time interval are displayed on the x-axis
[2]Bars are not displayed when there are no patients eligible for at least one time interval. Additionally, specific time intervals without any eligible patients are not plotted.