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WELCOME to the Mission: Lifeline STEMI & Cardiac Resuscitation Systems of Care Webinar



Chris Granger, MD Chair Mission: Lifeline Advisory Working Group
Graham Nichol, MD Chair Mission: Lifeline Cardiac Resuscitation
Chris Bjerke, RN, MBA National Mission: Lifeline Director

Chris Granger, MD

- Research contracts: AstraZeneca, Novartis, GSK, Merck, Sanofi-Aventis, BMS, Pfizer, The Medicines Company, Astellas, Medtronic, and Boehringer Ingelheim
- Consulting/Honoraria: AstraZeneca, GSK, BMS, Pfizer, Lilly, Novartis, Roche, Boehringer Ingelheim, The Medicines Company, and Sanofi-Aventis
- For full listing see www.dcri.duke.edu/research/coi.jsp

Graham Nichol, MD

• Funding

- University of Washington, Seattle, WA. Salary, Medic One Foundation Endowed Chair in Prehospital Emergency Care.
- NHLBI, Bethesda, MD. Co-PI, Resuscitation Outcomes Consortium Data Coordinating Center.
- NHLBI, Bethesda, MD. PI, Randomized Trial of Hemofiltration After Resuscitation from Cardiac Arrest.
- NHLBI, Bethesda, MD. Co-I, Randomized Field Trial of Cold Saline IV After Resuscitation from Cardiac Arrest.
- NHLBI, Bethesda, MD. Co-I. Monitoring Disparities in Chronic Conditions.
- Medtronic Foundation, Minneapolis, MN. PI, Cascade HeartRescue Program.

Speaker Disclosures Continued

- Collaborations
 - Sotera Wireless, San Diego, CA. Unpaid research collaborator.
 - Gambro Renal Inc., San Diego, CA. Unpaid research collaborator
 - .
- AHA Volunteer
 - Member, Western States Affiliate BOD
 - Volunteer, Mission:Lifeline Cardiac Resuscitation
 - Member, National Advanced Cardiac Life Support Subcommittee
 - Chair, Resuscitation Science Symposium Planning Committee

Chris Bjerke

- American Heart Association Employee
- No other disclosures

Outline

Mission: Lifeline Background

- STEMI Statistics
- Mission: Lifeline History
- Program updates
- Program Outcomes

Opportunities to Improve Systems of Care

Cardiac Resuscitation Statistics

- History
- Mission: Lifeline Tools
 - Point of Entry Protocol
 - Ideal System Elements

How Can you get involved?

- Questions and Answers



Acute Myocardial Infarction (AMI) Statistics

- Myocardial infarction strikes 935,000 people a year in the United States
- Over 250,000 of those are STEMIs
- It is estimated that the combination of direct and indirect health care costs of coronary heart disease reached over \$500 billion in 2011
- 1 of 6 deaths (>400,000 per year) is from coronary disease
- Coronary heart disease is the single largest killer

History 2004-2006

MAY 2004

AHA recruited an Advisory Working Group (AWG)

JUNE 2005

Price Waterhouse Coopers presents its market research to AWG

MARCH 2006

AWG Consensus Statement appears in *Circulation*

Stakeholders called to action

AWG develops a set of guiding principles

AHA held a conference of multidisciplinary groups involved in STEMI patient care

Circulation

JOURNAL OF THE AMERICAN HEART ASSOCIATION

AHA Consensus Statement

Recommendation to Develop Strategies to Increase the Number of ST-Segment–Elevation Myocardial Infarction Patients With Timely Access to Primary Percutaneous Coronary Intervention

The American Heart Association's Acute Myocardial Infarction (AMI) Advisory Working Group

Alice K. Jacobs, MD, FAHA, Chair; Elliott M. Antman, MD, FAHA; Gray Ellrodt, MD; David P. Faxon, MD, FAHA; Tammy Gregory; George A. Mensah, MD, FAHA*; Peter Moyer, MD; Joseph Ornato, MD, FAHA; Eric D. Peterson, MD, FAHA; Larry Sadwin; Sidney C. Smith, MD, FAHA

History 2007-2008

EARLY 2007

Drafts of STEMI Systems of Care manuscripts are finalized

Action items for the AHA begin to take shape

APRIL 2007

A cross-functional team was recruited to spearhead Mission: Lifeline

MAY 2007

Eleven manuscripts are published in *Circulation*

Mission: Lifeline was formally launched

JULY 2008

Affiliate Staff Kick-Off was held



Development of Systems of Care for ST-Elevation
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Development of Systems of Care for ST-Elevation

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

Executive Summary

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

Alice K. Jacobs, MD, FAHA, Chair; Elliott M. Antman, MD, FAHA; David P. Faxon, MD, FAHA; Tammy Gregory; Penelope Solis, JD

2009-Present

SPRING 2009

Completion of a national EMS Assessment for STEMI Systems represents 91% of US population

FALL 2009

Accreditation requirements for STEMI Systems, hospitals and EMS Agencies are released

2010

Hospital recognition program and reports are released

2011

AHA collaborates with SCPC and hospital accreditation program released

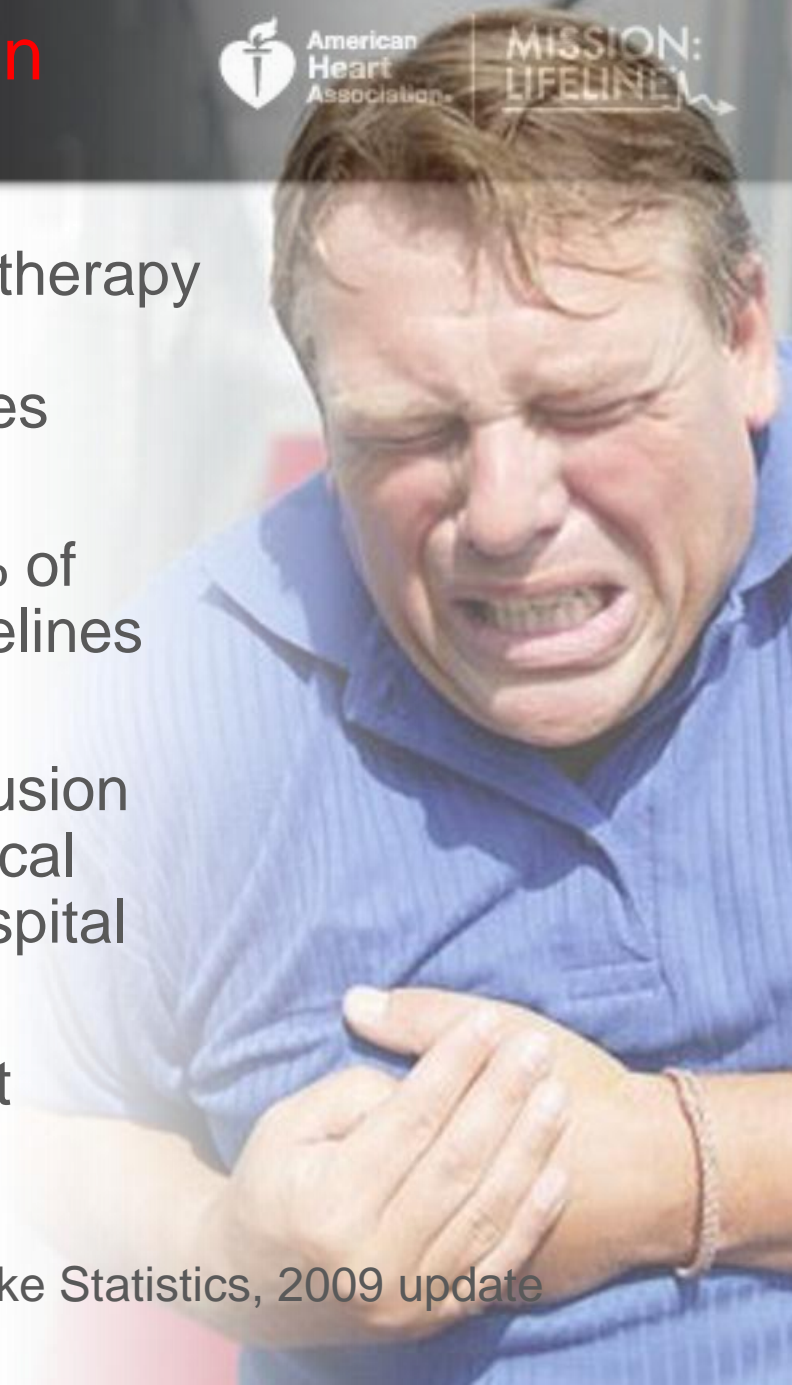


ST Elevation Myocardial Infarction (STEMI)



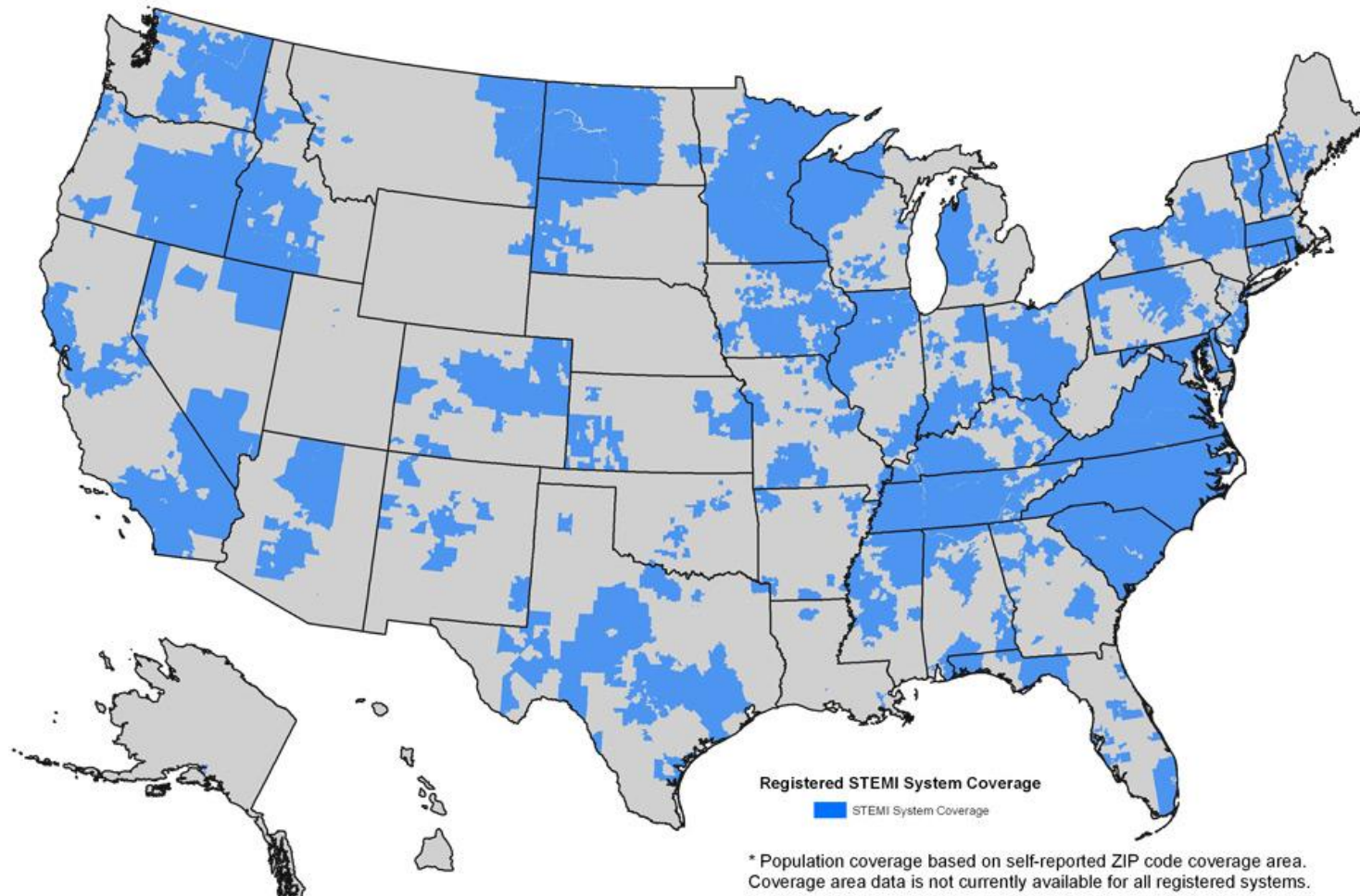
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- Early diagnosis and rapid reperfusion therapy for ST-segment myocardial infarction (STEMI) limits infarct size and improves survival
- Door-to-balloon is <90 minutes in 90% of cases in ACTION- Get With The Guidelines Registry
- Current guidelines recommend reperfusion therapy within 90 minutes of first medical contact and within 120 minutes for hospital transfers
- Delay in symptom onset to treatment increases mortality



STEMI Systems Coverage

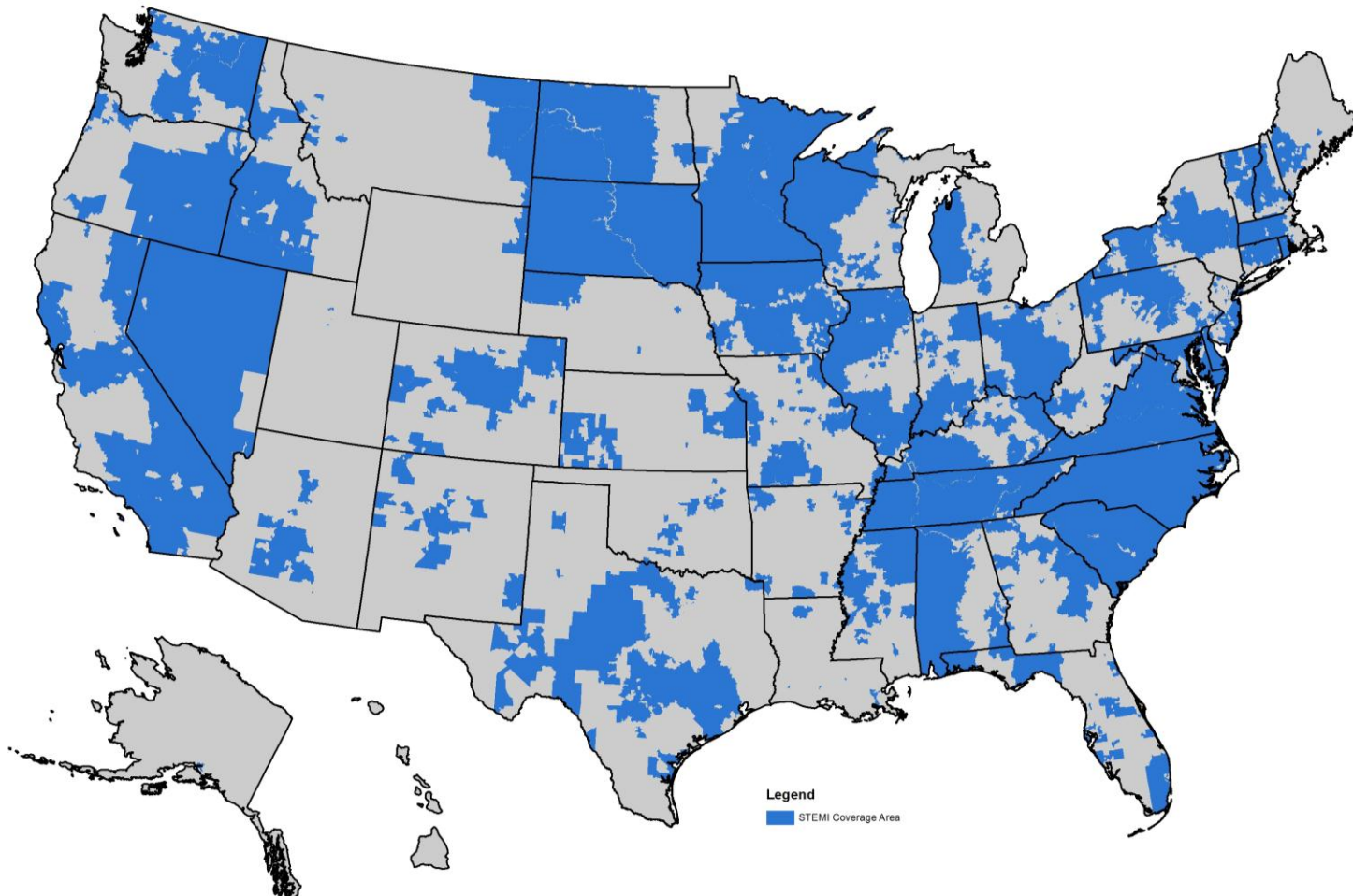
As of 6/3/2011 (563 Systems; 58.9% Population Coverage)



* Population coverage based on self-reported ZIP code coverage area. Coverage area data is not currently available for all registered systems.

STEMI Systems Coverage

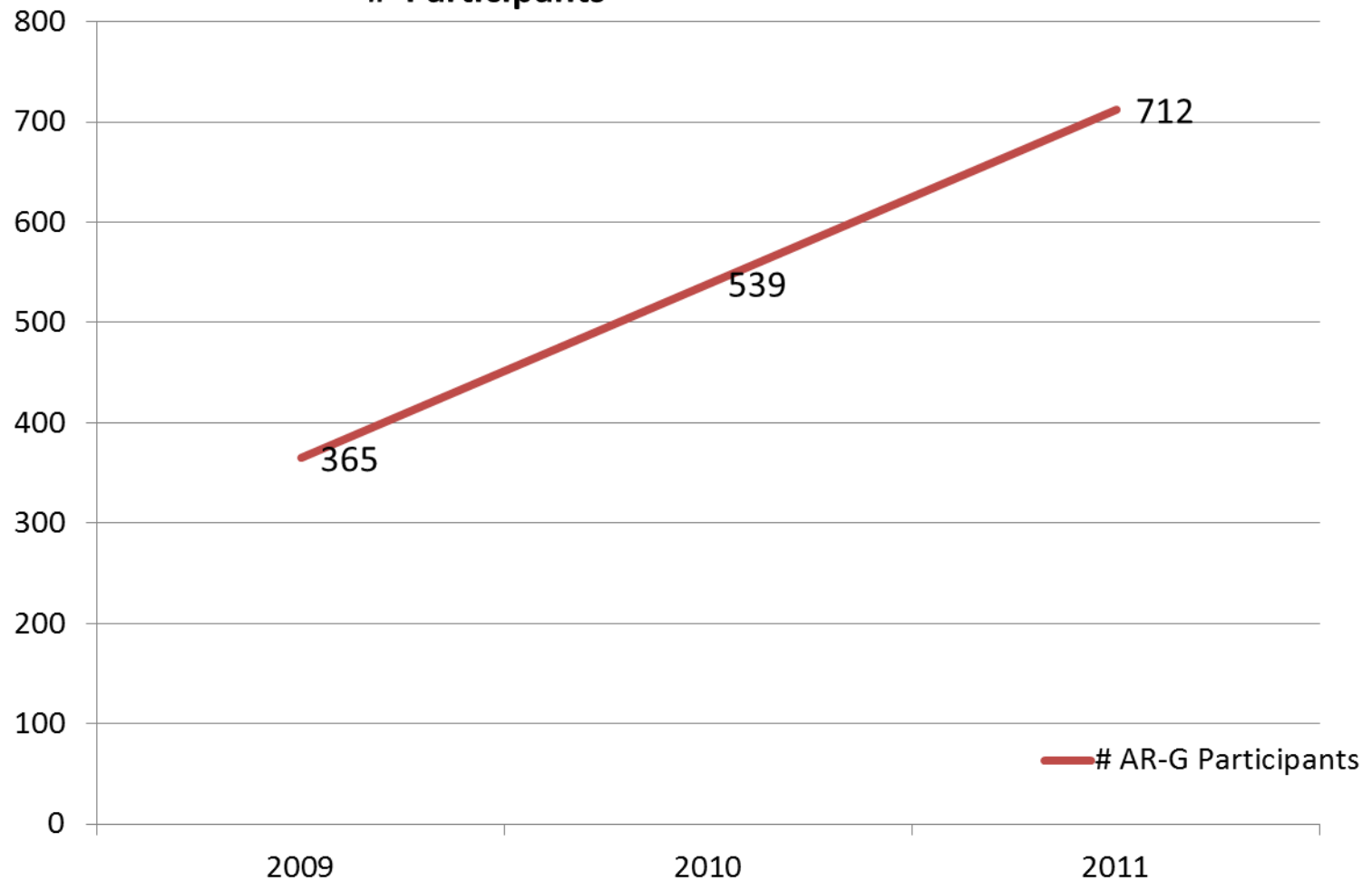
As of 3/5/2012 (615 Systems; 61.4% Population Coverage)



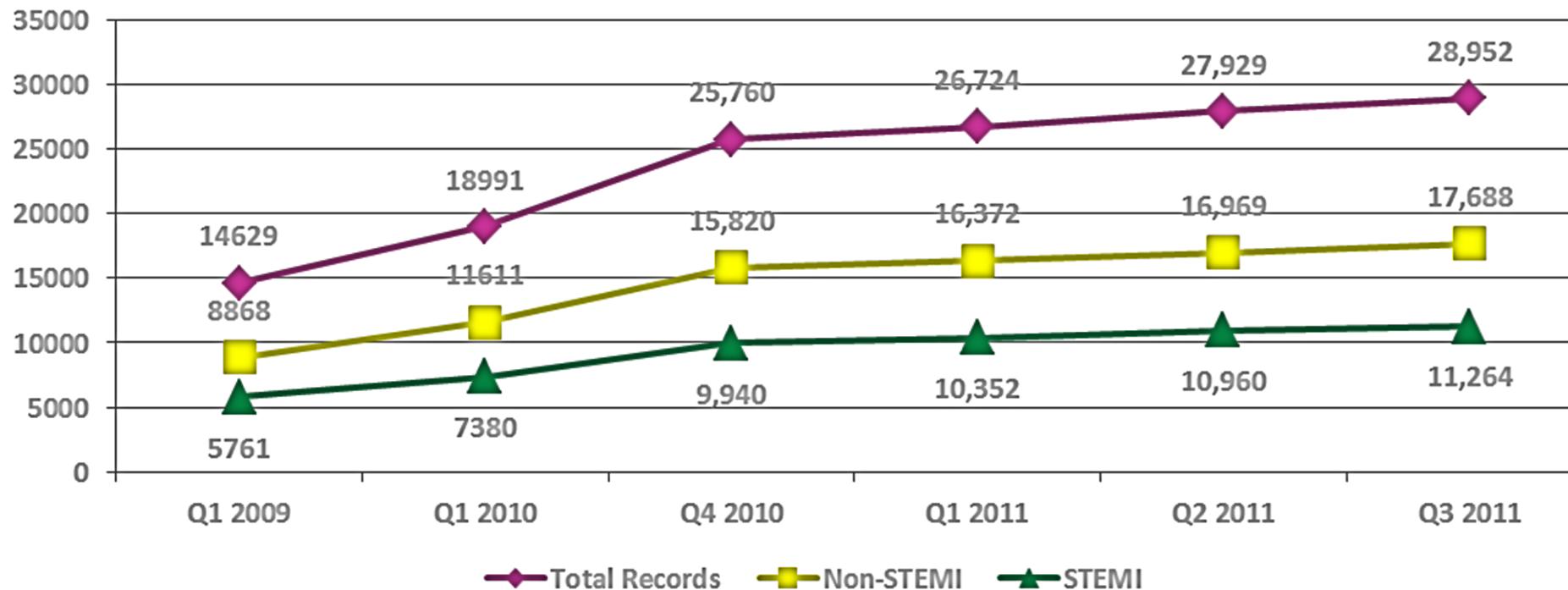
ACTION Registry-GWTG[®]

For acute coronary syndrome patients

Participants



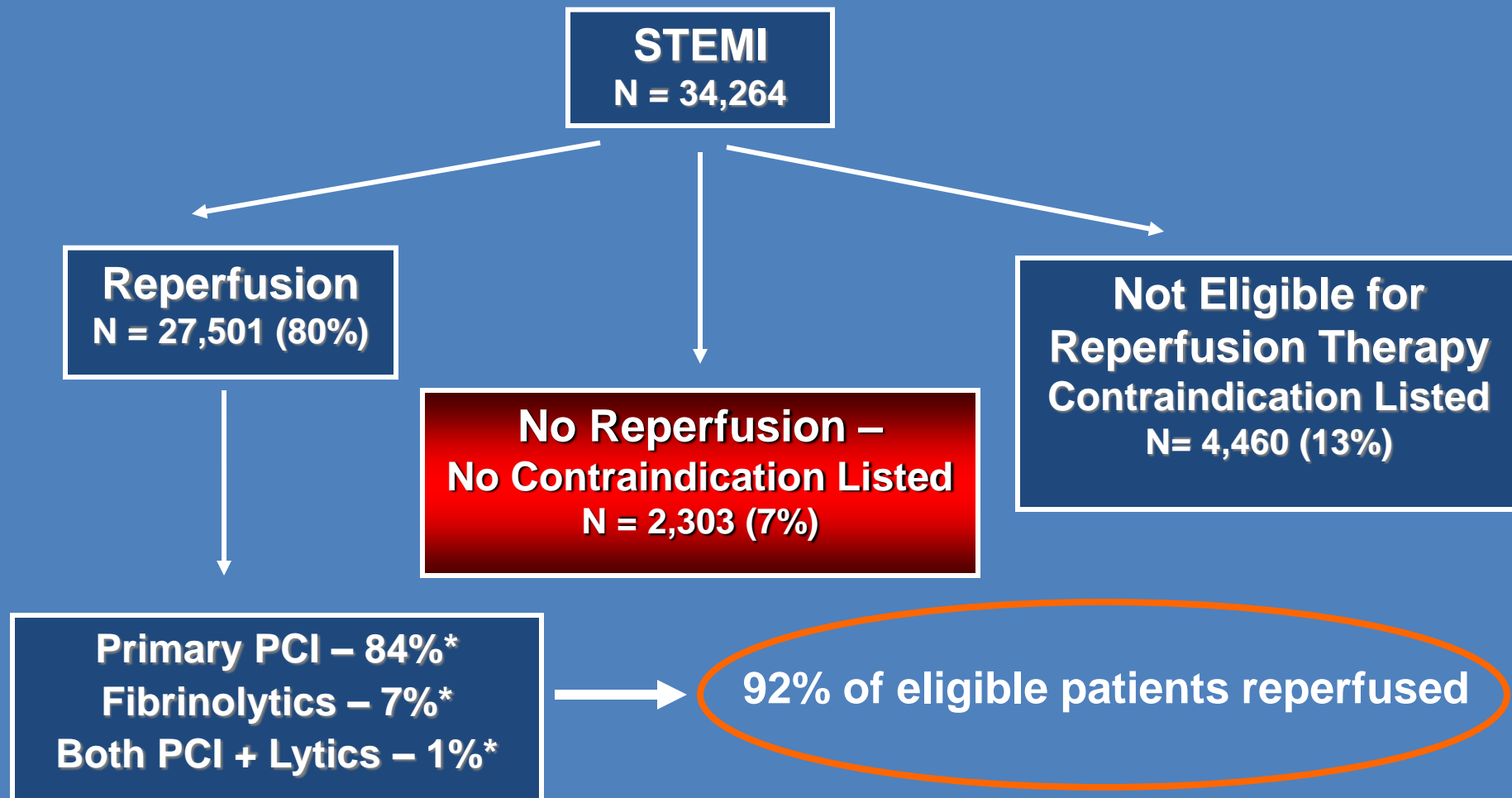
ACTION Registry-GWTG Records Submitted by Diagnosis



Use of Reperfusion Therapy for STEMI



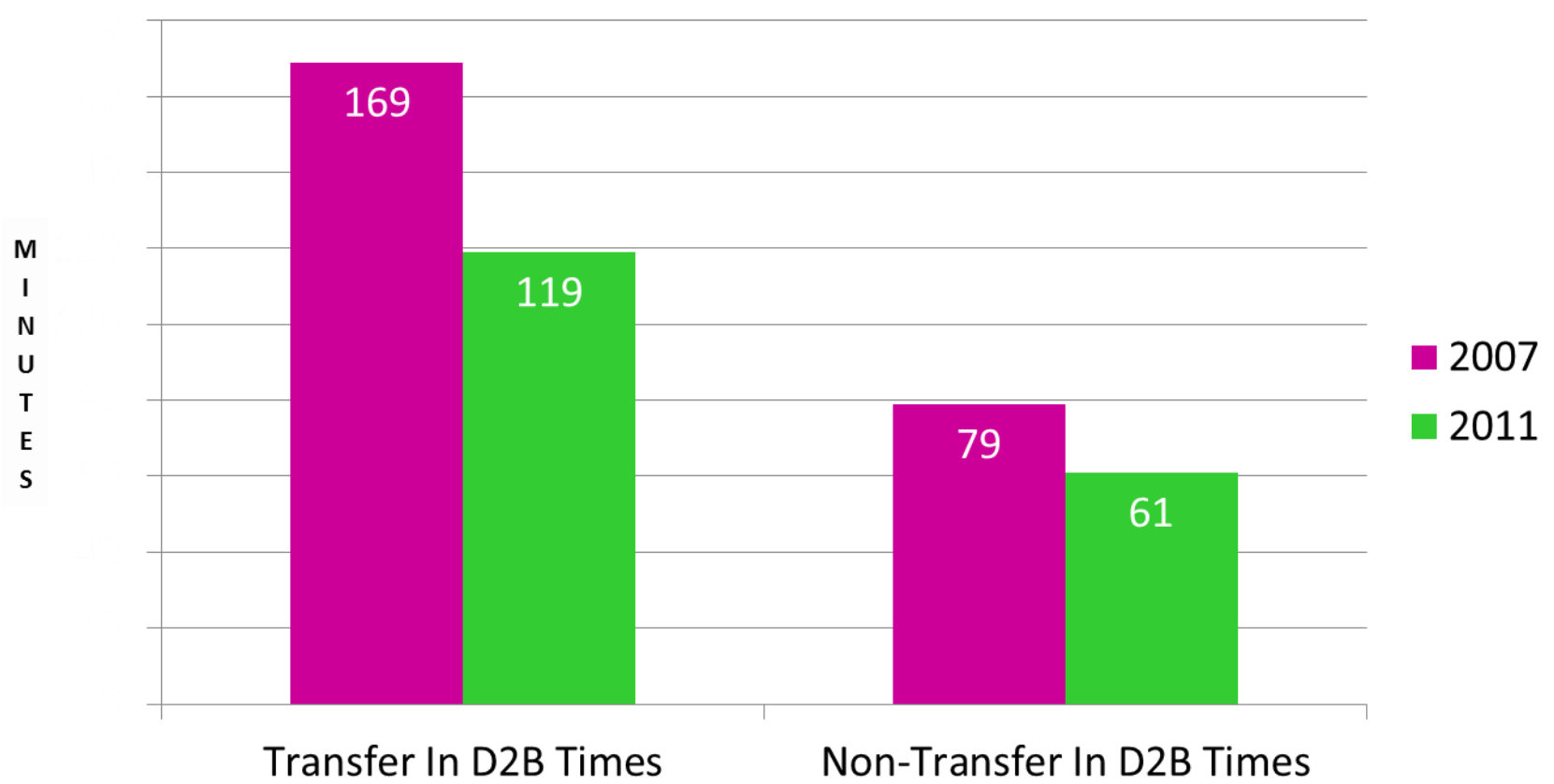
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* Among patients receiving reperfusion

STEMI Door-to-Balloon Times

Median Times for Transfer and Non-Transfer In patients

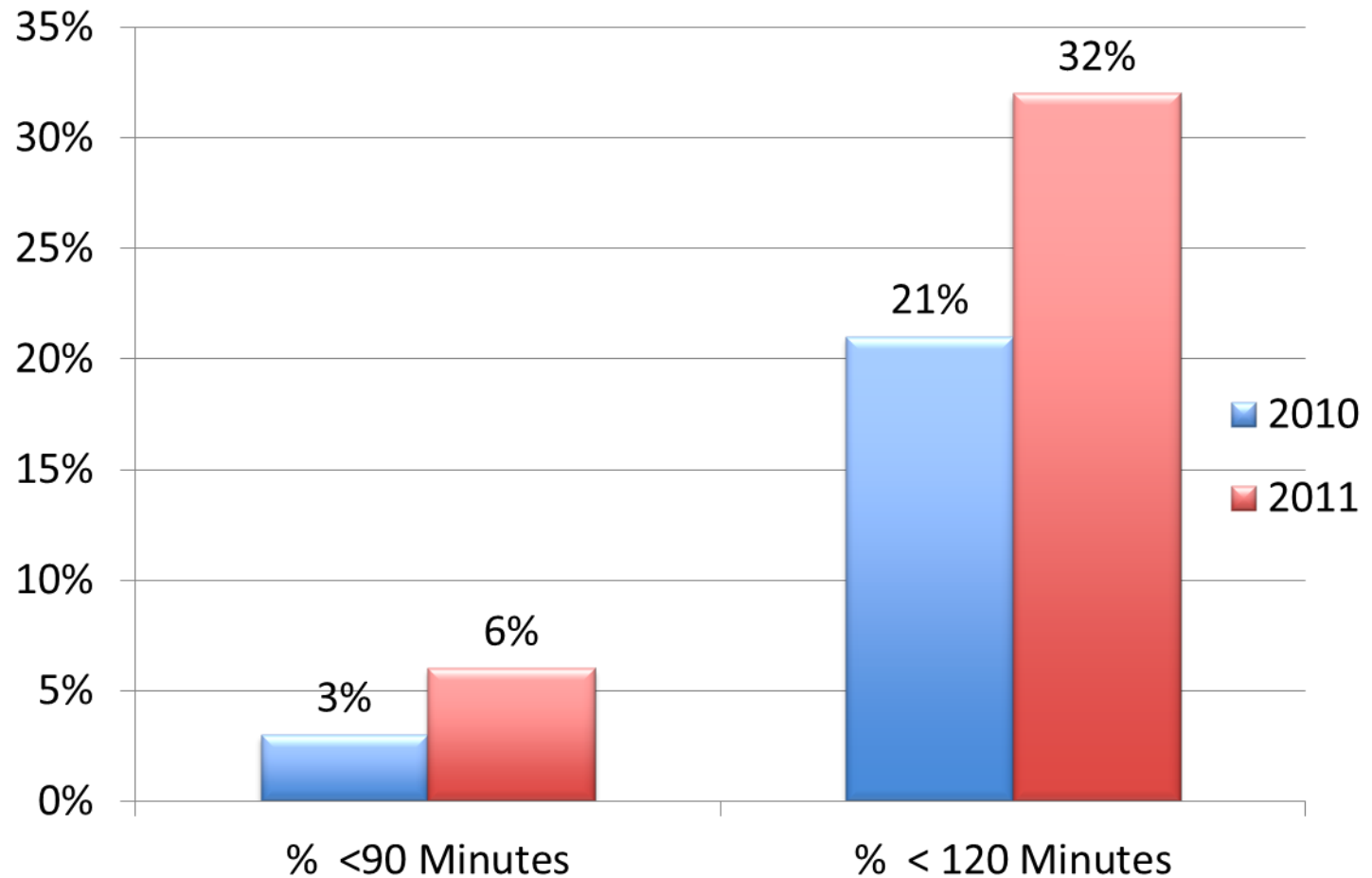


Mission: Lifeline Data



Measure Metric	National Score Q1 2010	National Score Q3 2011
Overall Mission: Lifeline Composite Score	94.5%	93.9%
Time to PPCI <=90 Minutes	91.5%	94.2%
Mission: Lifeline FMC to PPCI <=90 Minutes	56.9%	64.3%
Reperfusion Therapy	93.0%	~
ASA at Arrival	99.1%	98.9%
ASA at Discharge	98.5%	99.0%
Beta Blocker at Discharge	97.2%	97.9%
Statin at Discharge	98.5%	98.9%
ACE-I or ARB for LVSD at Discharge	89.7%	91.9%
Adult Smoking Cessation Advice	98.6%	98.3%

Door 1 – Transfer - Device



In-Hospital Outcomes - STEMI

Variable	STEMI (n=41,808)
Death*	6.0%
Re-infarction	0.9%
HF	5.3%
Cardiogenic Shock	4.6%
Stroke	0.6%
RBC Transfusion**	7.9%
Suspected Bleeding Event**	4.2%

*Unadjusted mortality

** Among non-CABG

Mission: Lifeline Goals

- Promote the ideal STEMI and Cardiac Resuscitation systems of care
- Help STEMI and Cardiac Arrest patients get the life-saving care they need in time
- Bring together healthcare resources into an efficient, synergistic system
- Improve overall quality of care





- “MEN WANTED for Hazardous Journey. Small wages, long months of complete darkness, constant danger, safe return doubtful. Honour and recognition in case of success.”
– Ernest Shackleton



“They're not gonna catch us. We're on a mission from God.”
- Elwood in Blues Brothers

Why Create Better Systems?

- 382,000 individuals with out of hospital cardiac arrest assessed by EMS annually
 - Roger Circulation 2012
- About 50% of cardiac arrest victims have acute occlusion on coronary angiography
 - Nichol Circulation 2010
- 11.4% of those treated by EMS for cardiac arrest survive to discharge
 - Roger Circulation 2012
- 41% received bystander CPR
 - Roger Circulation 2012
- 2.1% had an AED applied by lay persons before EMS arrival
 - Weisfeldt JACC 2010

History

2010

Regional Systems of Care for Out-of-Hospital Cardiac Arrest: A Policy Statement from the American Heart Association

Circulation American Heart Association
JOURNAL OF THE AMERICAN HEART ASSOCIATION
Learn and Live.

Regional Systems of Care for Out-of-Hospital Cardiac Arrest: A Policy Statement from the American Heart Association
Graham Nichol, Tom P. Aufderheide, Brian Ergt, Robert W. Hesse, Keith G. Lurie, Vincent J. Bucklin, Catha W. Callaway, Vangelis Mehta, Robert B. Ross, Benjamin S. Abella, Michael Sayre, Cynthia M. Donoghue, Edward M. Rhee, Monica E. Klusman, Robert E. O'Connor, John P. Reilly, Eric W. Olson, Eric Peterson, on behalf of the American Heart Association Emergency Cardiovascular Care Committee, Council on Arteriosclerosis, Thrombosis, and Vascular Biology, Council on Cardiovascular Critical Care, Perspectives and Resuscitation, Council on Cardiovascular Nursing, Council on Clinical Cardiology, Advocacy Committee and Council on Quality of Care and Outcomes Research
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2011

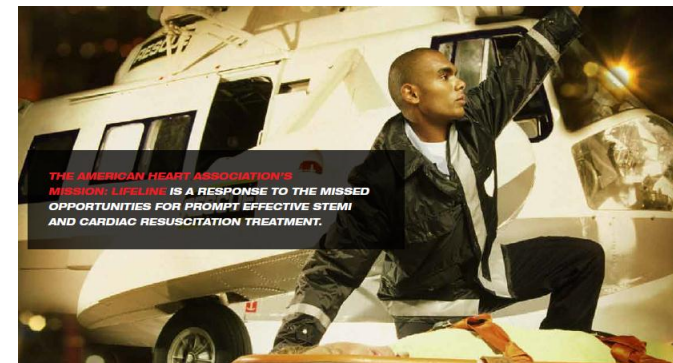
Task Force convened to explore addition of Cardiac Resuscitation quality improvement efforts to current M:L Program

- Overlapping clinical conditions
- Common providers and procedures
- Well-documented effectiveness of regionalized STEMI systems

Development of Ideal systems for Cardiac Arrest

APRIL 2012

Launch of STEMI and Cardiac Resuscitation Systems of Care Mission: Lifeline program

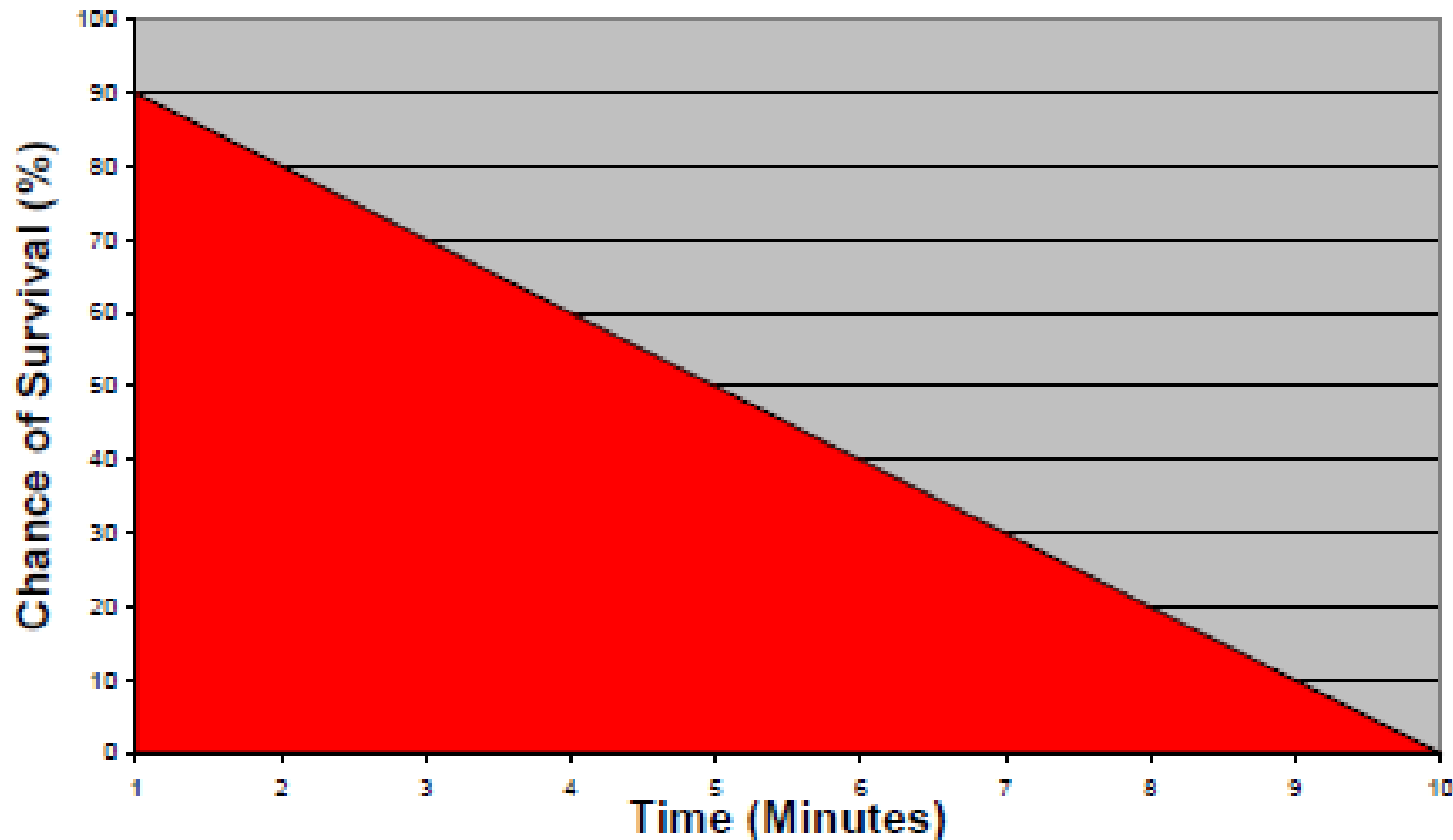


Why Add Cardiac Resuscitation to Mission: Lifeline STEMI ?

OPPORTUNITIES

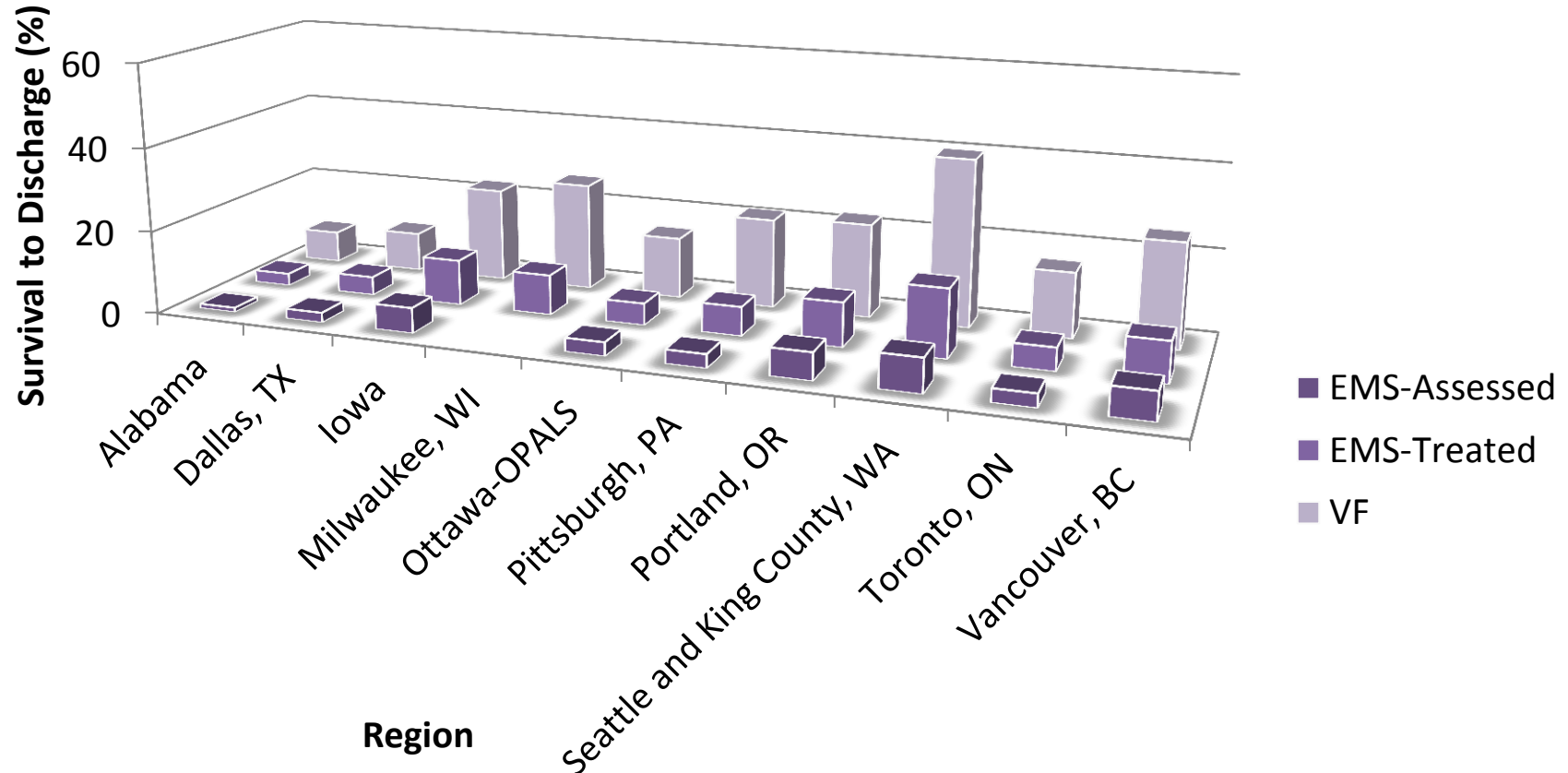
- Increase community response and action
 - Bystander CPR
 - Public access to AEDs
- Improve coordination by First Responder Professionals, EMS, Emergency Departments and Hospital providers
 - Effective and Continuous CPR
 - Induction of Therapeutic Hypothermia
 - Prompt PCI when indicated
 - Multidisciplinary Approach throughout the continuum of care
- Develop and implement regional system of care for patients resuscitated from OHCA
- Increase in continuous monitoring and reporting of OHCA incidence, process variables and outcomes

Each Minute Without CPR and Defibrillation a SCA Victim's Chance of Survival Decreases 7-10%



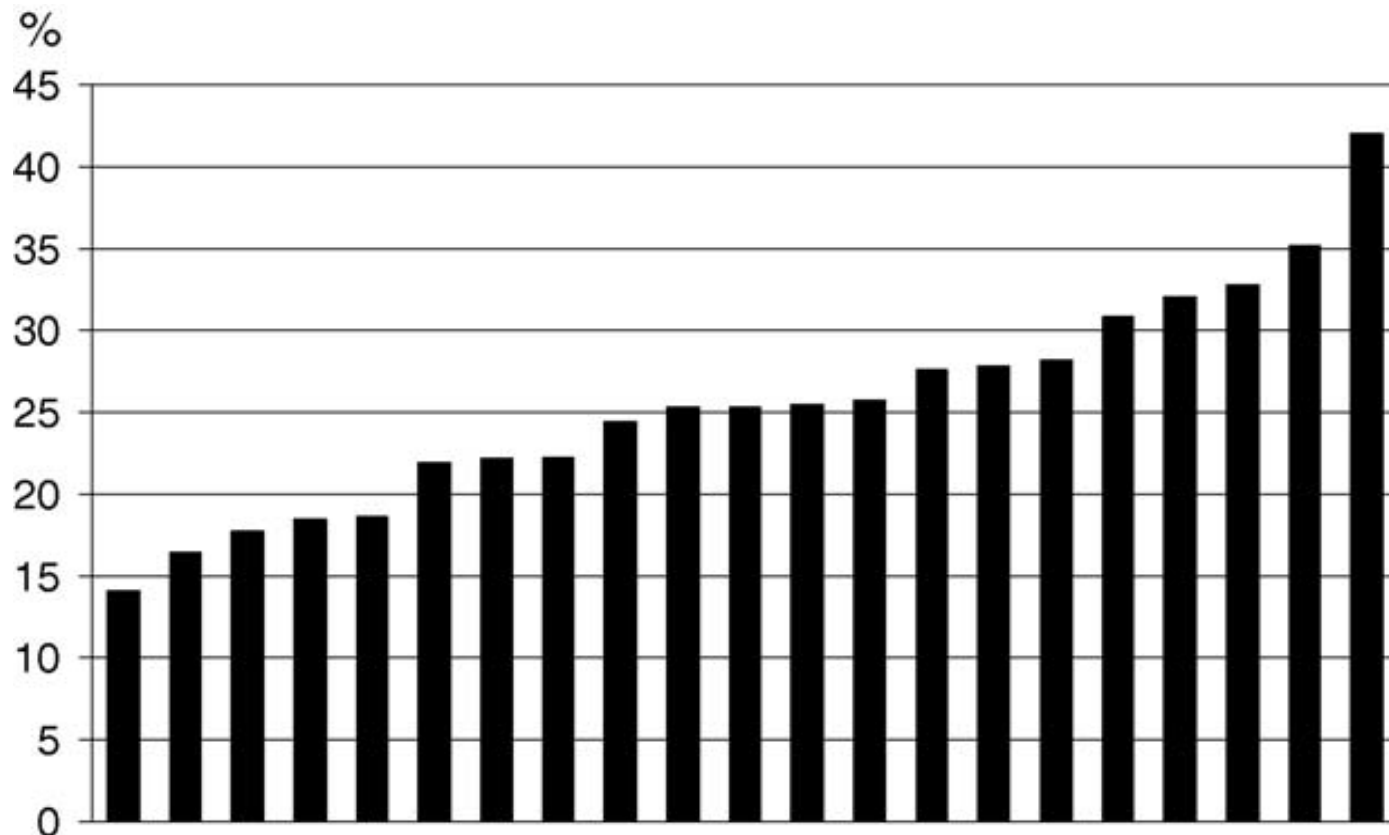
Large Regional Variation in Survival After Out-of-Hospital Cardiac Arrest

Nichol JAMA 2008



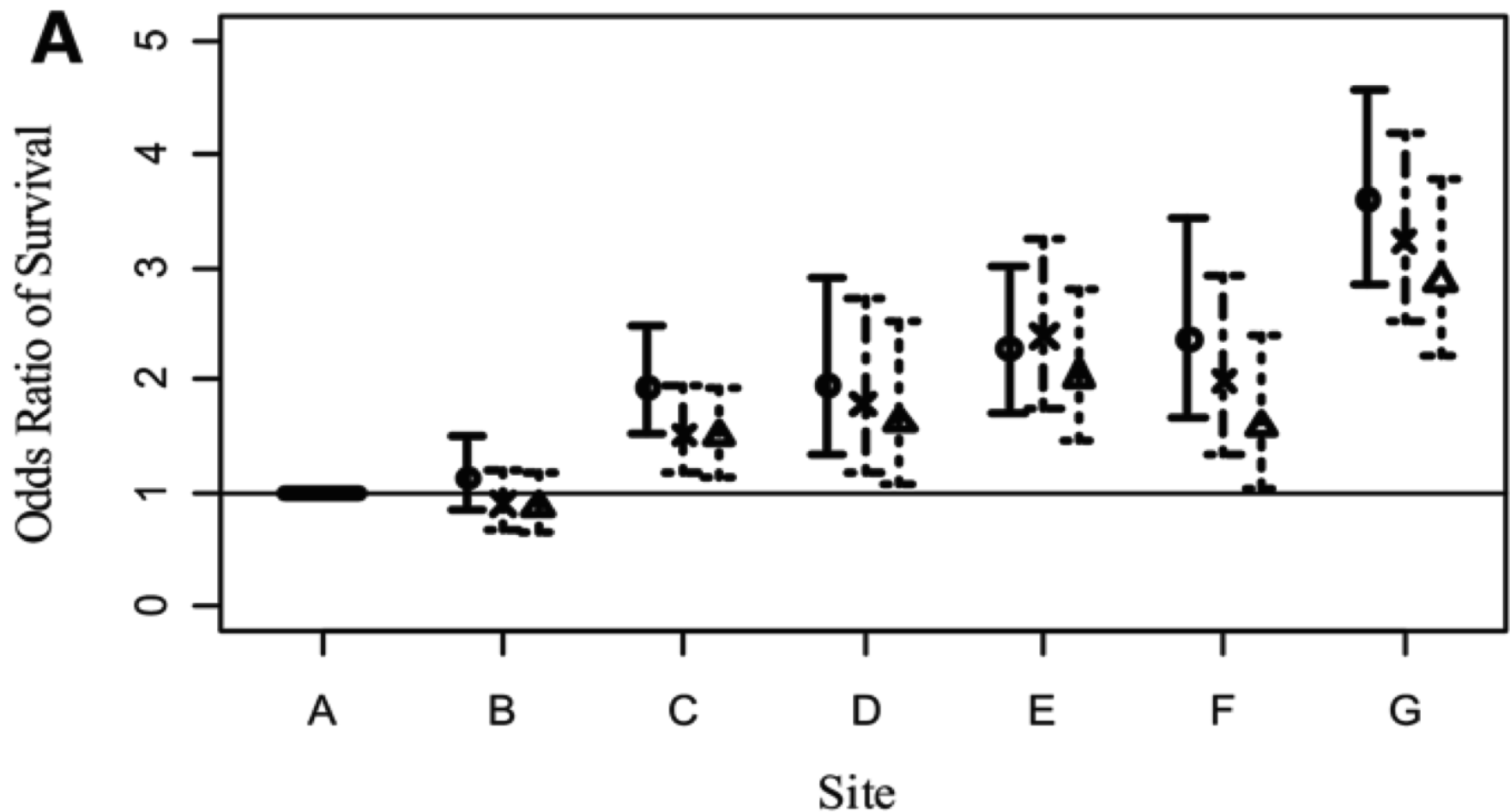
Large Regional Variation in Survival from Admission to One Month

Herlitz Resuscitation 2006



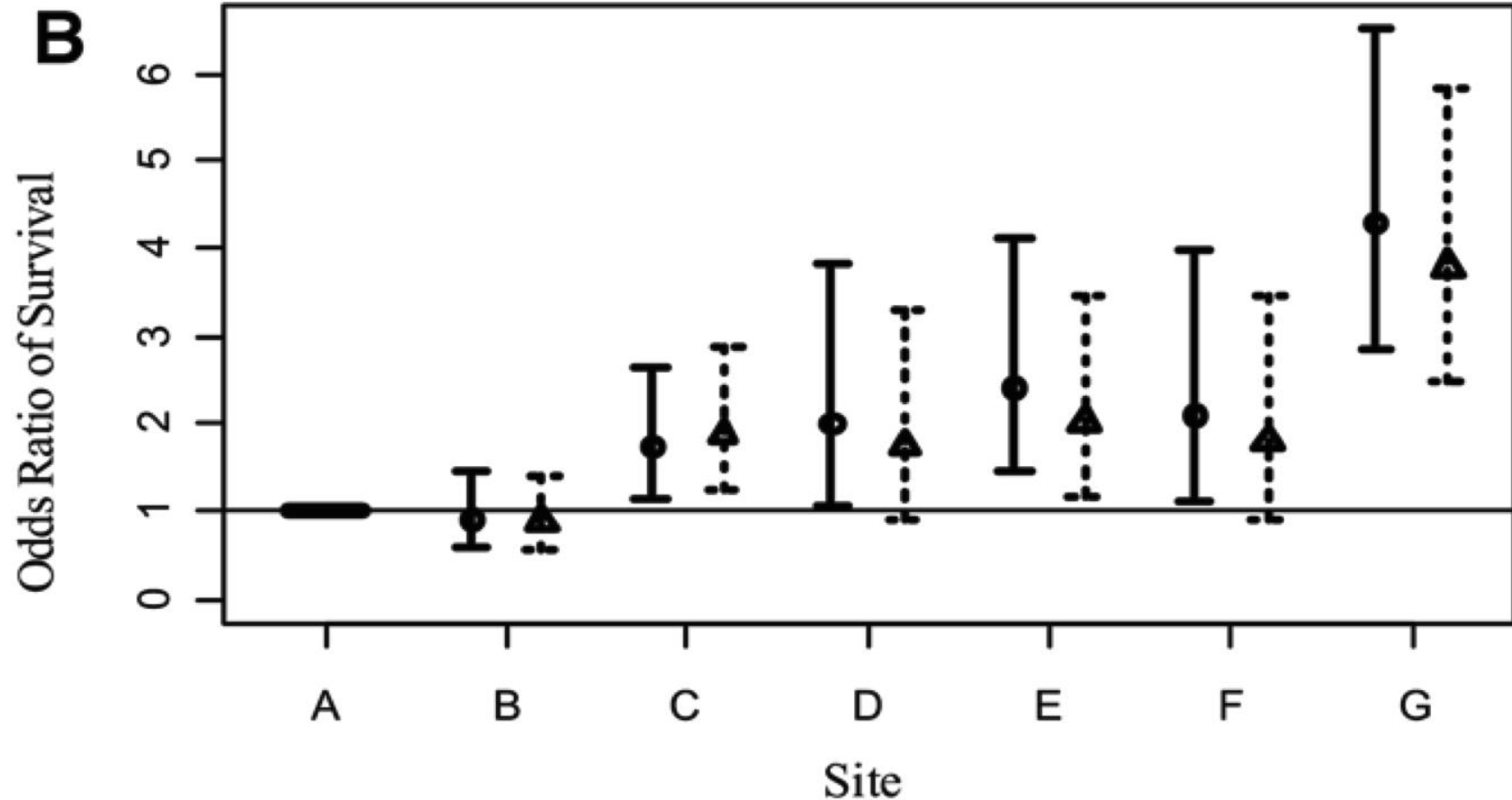
EMS-Treated Cardiac Arrest

Rea Ann Emerg Med 2010



Bystander Witnessed VF of Presumed Cardiac Etiology

Rea [Ann Emerg Med](#) 2010

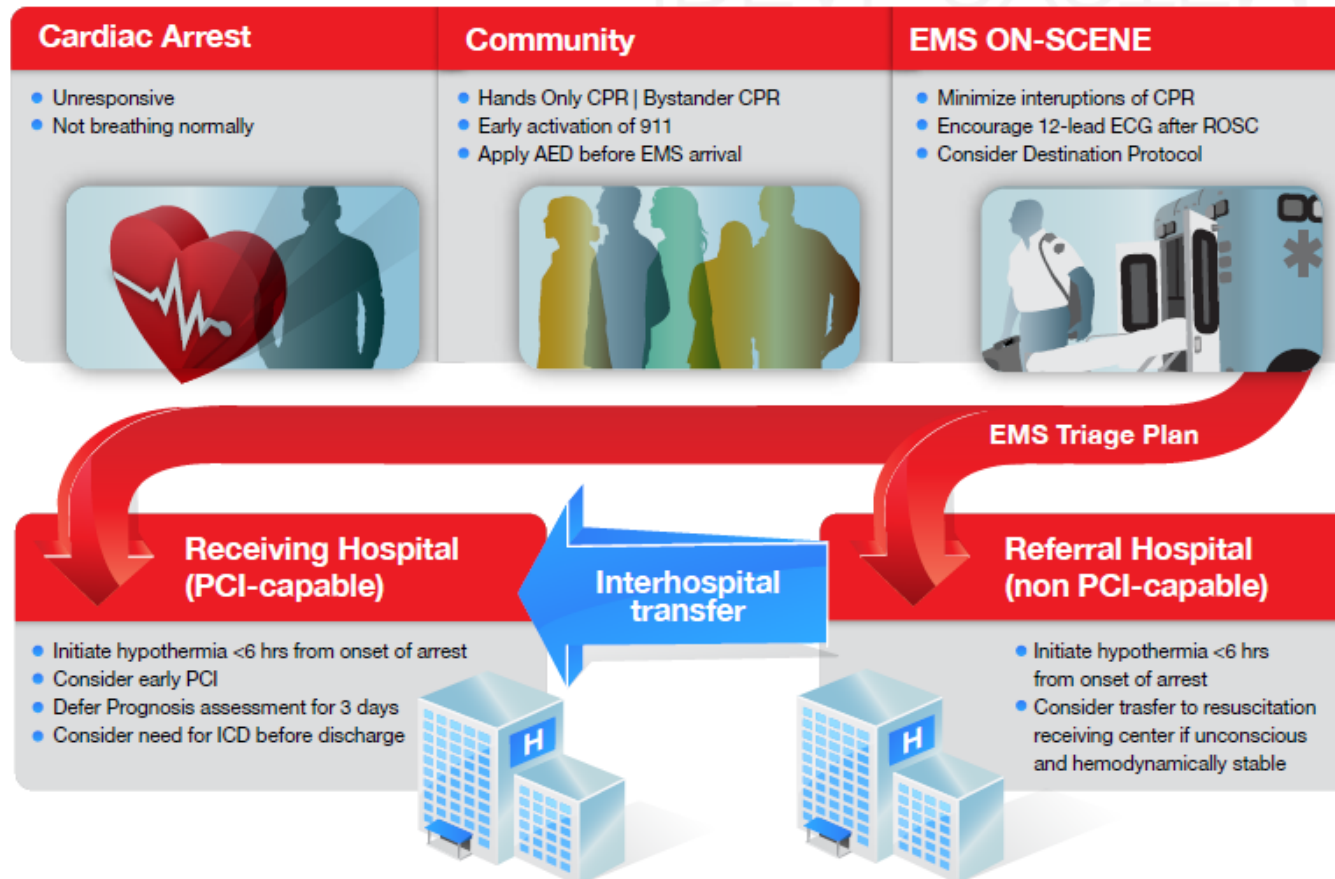




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STEMI & CARDIAC RESUSCITATION

IDEAL SYSTEM





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STEMI & CARDIAC RESUSCITATION IDEAL SYSTEM

Cardiac Resuscitation



System (all 5 required)

- Must meet ideal STEMI System requirements
- Register with Mission: Lifeline.
- Conduct on-going multidisciplinary team meetings that include Community, EMS, Cardiac Resuscitation Referral Centers, and Cardiac Resuscitation Receiving Center representatives or staff to monitor and improve Cardiac Resuscitation care process and outcomes.
- Has process for pre-hospital identification and activation of STEMI in patients resuscitated from OHCA, destination protocols to Cardiac Resuscitation Receiving Centers
- Has process for transfer of appropriate patients who arrive at Cardiac Resuscitation Referral Centers to Cardiac Resuscitation Receiving Centers
- Each system component (Community EMS, Cardiac Resuscitation Referral Centers, and Cardiac Resuscitation Receiving Centers) meets criteria listed above

Community

- Designated Community Champion for Cardiac Resuscitation
- Community has a multidisciplinary group to monitor, provide feedback and improve Cardiac Resuscitation care process and outcome.
- Uses multiple strategies to increase skills and awareness of CPR, including but not limited to CPR in schools, Hands-Only CPR, public awareness campaign, credentialled CPR courses, with a goal of achieving >50% bystander CPR
- Implements and maintains public access defibrillation program including training, regular maintenance and usage tracking
- External certification not self-designation as part of cardiac resuscitation system of care

EMS

- Must meet criteria for ideal STEMI EMS
- Medical director actively participates in multidisciplinary team including but not limited to EMS, emergency medicine, nursing, cardiology, neurology and critical care personnel, referral center staff and receiving center staff to monitor, provide feedback and improve Cardiac Resuscitation care processes and outcomes
- Implements and maintains destinations protocols for triage of patients to hospitals able to care for Cardiac Resuscitation patients
- Emergency medical dispatchers provide bystanders CPR instruction
- Provides audit and feedback of cardiac arrest process and outcome to provider and EMS
- Ambulances dispatched to suspected Cardiac Resuscitation have 12-lead ECG and manual defibrillator equipment where permitted by law and transport highest priority to appropriate receiving center
- Field triage of patients with return of circulation after arrest to Cardiac Resuscitation Receiving Center, when feasible (including transport time < 45 minutes longer than nearest hospital)
- Able to communicate ECG results to the Cardiac Resuscitation Receiving Center when possible
- Send patient to the closest, most appropriate Cardiac Resuscitation Referral or Receiving Center
- External certification not self-designation as part of cardiac resuscitation system of care
- Should include at least compression-only CPR training for all employees.

Referral Center (no PCI)

- Must meet criteria for ideal STEMI Referral Center
- Designated hospital champion for Cardiac Resuscitation
- Actively participates in multidisciplinary team meetings to monitor, provide feedback and improve Cardiac Resuscitation care process and outcome
- Implements and maintains standard triage and treatment protocols for Cardiac Resuscitation patient consistent with ACC/AHA guidelines
- Implements and maintains a plan with EMS to ensure inter-hospital transfers receive priority response
- Initiates hypothermia as soon as possible, when indicated
- Not capable of PPCI.
- Transports early patients resuscitated from OHCA to Cardiac Resuscitation Receiving Center to allow angiography of cath eligible/appropriate patients as soon as possible, to achieve goal of first door to device within 120 minutes
- Implements and maintains ability to treat re-arrest including mechanical CPR AND/OR pharmacological support if indicated
- Provides CPR training for community, with goal of achieving bystander CPR rates > 50%
- Provides CPR and ACLS training for appropriate staff
- External certification not self-designation as part of cardiac resuscitation system of care
- Should include at least compression-only CPR training for all employees.

Receiving Center (PCI-capable)

- Must meet all requirements of a STEMI Receiving Center
- Designated hospital champion for Cardiac Resuscitation
- Actively participates in multidisciplinary group to monitor, provide feedback and improve Cardiac Resuscitation process and outcome
- Implements and maintains standard triage and treatment protocols for Cardiac Resuscitation patient consistent with AHA guidelines
- Works with EMS medical direction and cardiac resuscitation referral center to develop Cardiac Resuscitation treatment plan
- Initiates hypothermia as soon as possible when indicated
- Initiates cardiology consult as soon as possible
- Universal 24/7 acceptance of Cardiac Resuscitation patients regardless of diversion status of ED
- Has plan to treat simultaneous Cardiac Resuscitation patients
- Has plan for and ability to treat re-arrest, including mechanical CPR AND/OR pharmacological support
- Capable of assessment of need for ICD placement and providing appropriate follow up
- Defers assessment of prognostication and withdrawal of care for at least 72 hours after Cardiac Resuscitation.
- Participates in regional or national quality improvement program for to monitor and improve Cardiac Resuscitation care processes and outcome
- Integrate plans for return of the patient to the local community for follow-up care following discharge from the Cardiac Resuscitation Receiving hospital on a routine basis
- Provides CPR training for community, with goal of achieving bystander CPR rates > 50%
- Provides CPR, ACLS and PALS training for appropriate staff
- External certification not self-designation as part of cardiac resuscitation system of care
- Should include at least compression-only CPR training for all employees.

Ideal Community

- Hands Only CPR with a goal of achieving >50% bystander CPR
- Early activation of 911
- Apply AED before EMS arrival
- Designated Community Champion
- Multidisciplinary group to monitor, provide feedback and improve processes and outcomes
- Implements and maintains public access defibrillation program
- Identify Community Champion



Ideal EMS

- EMS Dispatchers provide bystanders CPR instruction
- Ambulances are equipped with 12-lead ECG machines and Manual defibrillators
- EMS providers are trained to:
 - Use and transmit 12-lead ECGs
 - Care for STEMI & Cardiac Arrest
 - Provide feedback on performance and compliance with guidelines
- For positive ECG results provides early cath lab activation enroute
- Implements and maintains destinations protocols for triage of patients to hospitals able to care for Cardiac Resuscitation & STEMI patients
- EMS Champion



Ideal Referral Hospital

- Standardized POE protocols dictate transport of STEMI patients directly to a receiving hospital based on:
 - Specific criteria for risk; including cardiac arrest
 - Contraindications to thrombolysis
 - The proximity of the nearest PCI service
- Patients presenting to a referral hospital are treated according to standardized triage and transfer protocols
- Initiates hypothermia as soon as possible, when indicated
- Transports early patients resuscitated from OHCA to Receiving Center to allow angiography of cath eligible/appropriate patients as soon as possible, to achieve goal of first door to device within 120 minutes

Ideal Referral Hospital (Continued)

- Rapid and efficient data transfer, data collection and feedback
- Integrated plans for return of the patient to the community for care are provided
- Provides CPR training for community, with goal of achieving bystander CPR rates > 50%
- Implements and maintains ability to treat re-arrest including mechanical CPR AND/OR pharmacological support if indicated
- Referral Hospital Champion



Ideal Receiving Hospital

- Pre-hospital ECG diagnosis of STEMI, ED notification and cath lab activation occurs according to standard algorithms
- Algorithms facilitate:
 - A short ED stay for the STEMI patient
 - Transport directly from the field to the cath lab
- Single-call systems activate the cath lab
- Primary PCI is provided as routine treatment for STEMI 24-7
- Has plan for and ability to treat re-arrest, including mechanical CPR AND/OR pharmacological support
- Capable of assessment of need for ICD placement and providing appropriate follow up
- Defers assessment of prognostication and withdrawal of care for at least 72 hours after Cardiac Resuscitation.
- Receiving Center Champion

Ideal System of Care

- Individual parties are encouraged to work together for common goals.
- Build a consensus on what the ideal STEMI system looks like for their region, considering its unique challenges
- System Champion



How Can You Get Involved?



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YOU CAN MAKE THE DIFFERENCE BETWEEN
AN EVENT THAT KILLS AND ONE THAT DOESN'T.
**STEMI AND CARDIAC RESUSCITATION
SYSTEMS OF CARE.**



STEMI and Cardiac Resuscitation Systems of Care



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HOSPITAL
Accreditation
& Certification



Existing Users

- STEMI and Cardiac Resuscitation
- STEMI
- Resuscitation



New Users

- STEMI and Cardiac Resuscitation
- STEMI

Questions

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