







HAPPY VALENTINES DAY

RACING To SAVE Lives in NC
"NC Cardiac Arrest Registry"

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2/14/2013

HeartRescue PROJECT

Every Second Counts. Every Action Matters.

RACE

Cardiac Arrest Resuscitation System

Conflicts of Interest:

- No Conflict
- Our project is funded by the Medtronic Foundation
- The Medicines Company

Objectives:

- Discuss regionalization of care
- Review National and NC Statistics
- Discuss strategies for improving time sensitive emergency care


If we can't save them,
DONATE LIFE
DONE VIDA
RACE CARS

History STEMI Systems in NC:

"RACE moved beyond the cath lab and PCI hospitals to focus on EDs, EMS, hospital networks, and associated communication and transport systems." Heart.org

"AHA's Mission: Lifeline – A Call to Arms for Emergency Medicine" ACEP News Jan 2009

RACE Pilot 1st STEMI System — 2003

RACE 65 hospitals/ Multiple EMS Agencies — 2005 2006 2007

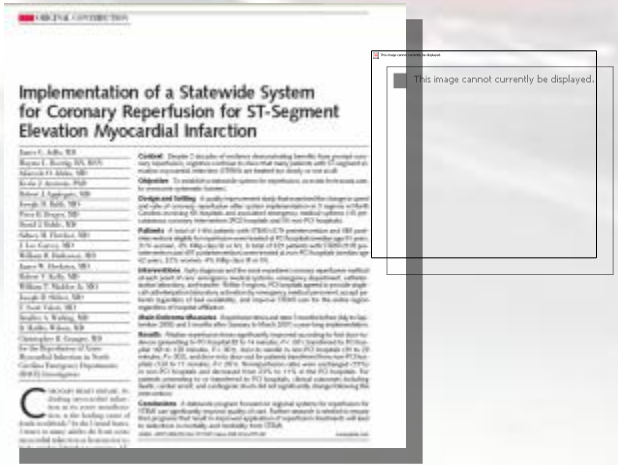
RACE - ER Entire State — 2008 2009

RACE CARS Goal: Improve OOHCA survival by 50% by 2015

Mission Lifeline RACECARS — 2010 2011 - 2015

"Racing Against the Clock: A North Carolina-based project becomes a model for discovery-to-balloon"
Richard R. Rogoski 2008

"RACE: A Herculean attempt to improve STEMI care"
Nov 12, 2007 Lisa Nainggolan

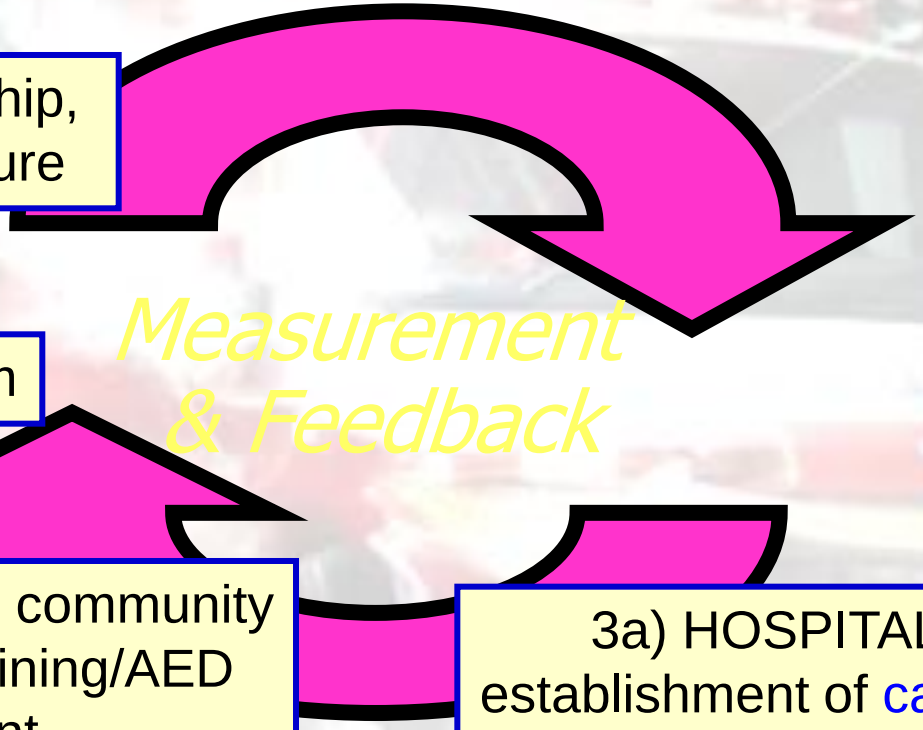

Implementation of a Statewide System for Coronary Reperfusion for ST-Segment Elevation Myocardial Infarction

"North Carolina's RACE program cuts door-in door-out times for STEMI patients"
Jun 28, 2011 Reed Miller

RACE *Cardiac Arrest Resuscitation System*

2) Establish REGIONAL *CARDIAC ARREST* CENTERS

1) Develop leadership, funding, data structure



4) Improve system

3c) Community by community cardiac arrest training/AED placement

3a) HOSPITAL by hospital establishment of cardiac arrest plan (review, consensus, training)

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

Definition of Regionalization:

- is a systematic method of bringing patients
  - from a defined geographic region
  - in need of specialized, specific emergent medical or surgical care
  - to designated facilities with the capabilities and resources immediately available to provide such treatment.

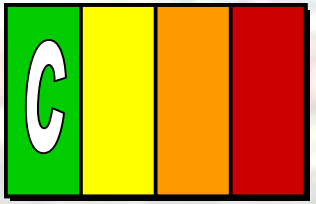
Systems of Care

Each community should develop a STEMI system of care following the standards developed for Mission Lifeline (AHA) including:

- Ongoing multidisciplinary team meetings with EMS, non-PCI, and PCI centers
- A process for pre-hospital identification and activation
- Destination protocols for PCI centers
- Transfer protocols for non-PCI centers for appropriate patients

NEW Recommendation

I IIa IIb III



ACC/AHA 2009 Joint STEMI/PCI Guidelines Focused Update JACC 2009

American Heart Association. | American Stroke Association.
Learn and Live.

TARGET: STROKE
TIME LOST IS BRAIN LOST.

AHA/ASA Recommendations for EMS Systems of Care for Stroke

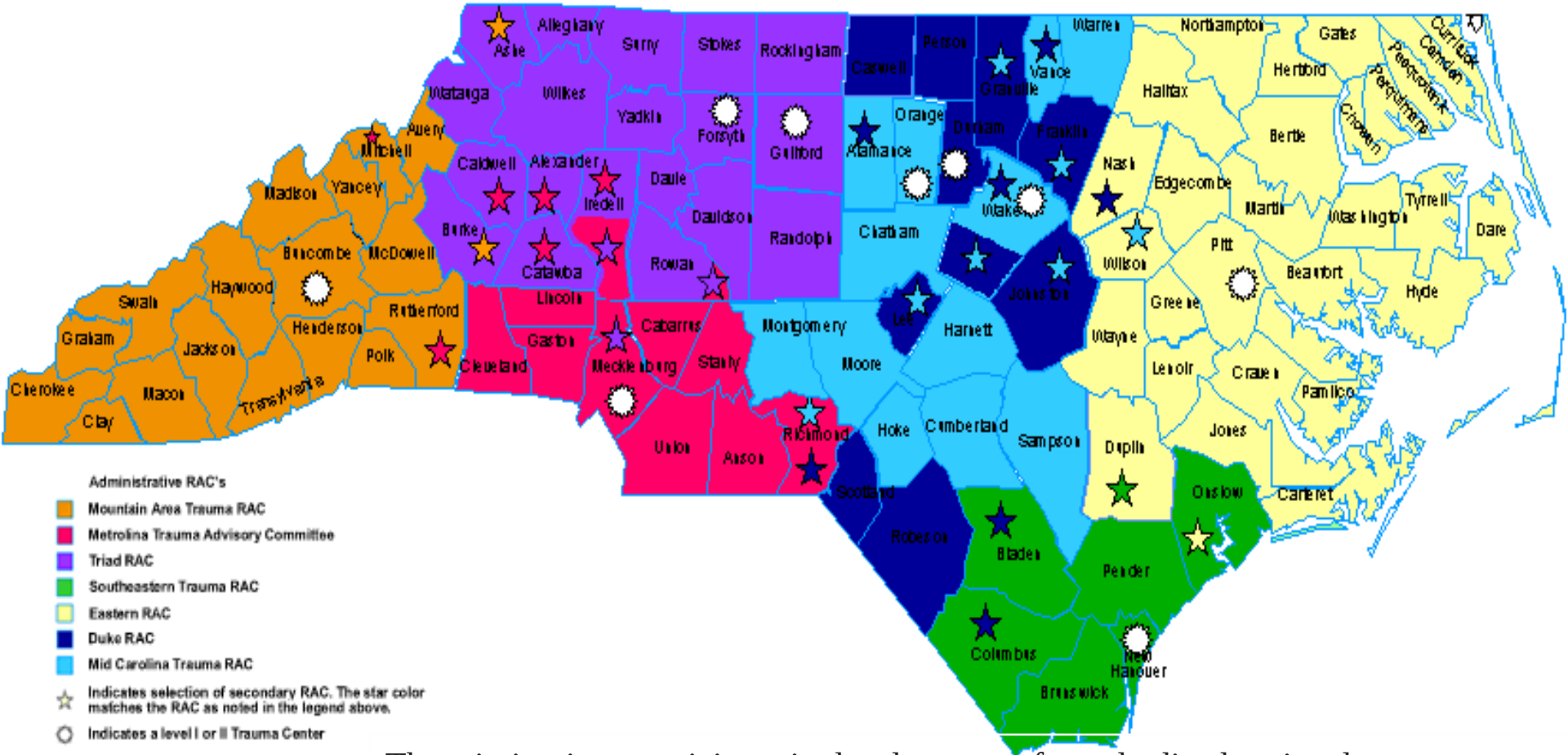
Exec Summary

1. Rapid dispatch.
2. Use algorithms/protocols.
3. Involve ER physicians, EMS and acute stroke team.
4. Transport to acute-stroke capable hospital.
5. Establish assessments for thrombolysis eligibility.

What would TRAUMA do?
The Trauma Call:

- Patient/bystander calls 911
- Dispatch
- EMS response
- **Recognition of a RED TAG trauma by Paramedics**
- Pre-hospital emergency care/treatment
- Notification of the Trauma Team prior to ED arrival
- Transport to the most appropriate facility (Level I Trauma Center)
- Early definitive care

North Carolina Trauma Centers
RACs- Regional Advisory Committee



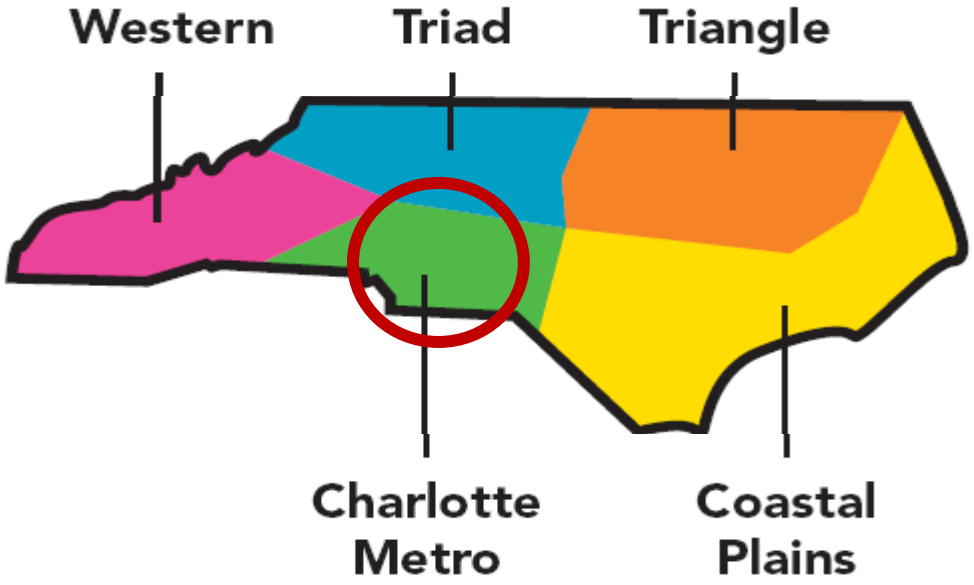
The mission is to participate in development of standardized regional trauma care, as well as the establishment and maintenance of a coordinated trauma system to promote optimal trauma care for all citizens within the Trauma RAC's area.

Charlotte Metro pop. >1,050,000 (2008)
18th largest city in the U.S.

98 Non PCI Hospitals

19 PCI Hospitals

500+ EMS Systems



RACE PCI Hospitals by Region (24 / 7 availability with on-site surgical backup)

Western	Triad	Charlotte Metro	Triangle	Coastal Plains
Frye Mission	Forsyth Highpoint Moses Cone WFUBMC	CMC CMC-Mercy CMC-Northeast Gaston Presbyterian	Duke Durham Regional UNC Rex Wake	Cape Fear Valley CarolinaEast First Health New Hanover Pitt

Hub and Spoke concept

Benefits of Regionalization:

- Right patient, right hospital, right time
- Streamlined process
- Eliminate duplication
  - Resultant cost reduction?
- Networking of un-networked hospitals

System Barriers to Implementing a Regional System:

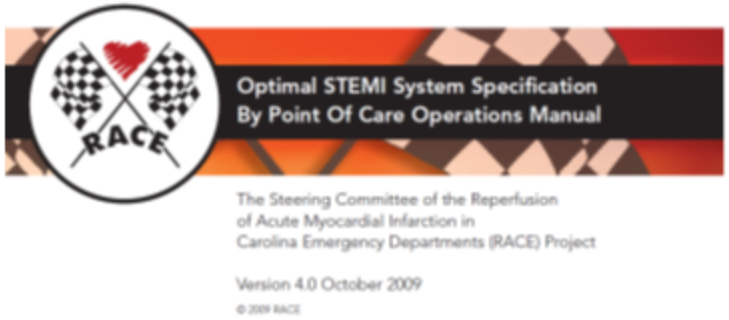
- Lack of integrated healthcare system
- Lack of standardized protocols
- Hospital overcrowding
- Reimbursement
- EMTALA
- Ambiguity of leadership
- Resources
- EMS level of provider
- Geographical challenges

Steps for Creating a Regional System for Stroke and STEMI Care:

- Create common goals based on evidence-national guidelines and specialty recommendations

- Design care tools that emphasize goals
- Create methods to measure performance (registries)
- Create a method to feedback results (real time & registries)
- Reformulate the aims
- Sustain the Gain

RACE Operations Manual:



Optimal system specifications by point of care

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

Single best plan per hospital: RACE OPERATIONS MANUAL:

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 IV infusions should only be used if required for stability during transfer.

OTHER MEDICATIONS

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

PRN Medications:

1. Nitroglycerin paste 1 to 2 inches topically PRN chest pain.
2. 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 _____ kg
Patient-specific dose _____ mg
(NOT TO EXCEED 50mg)

Patient Weight (kg)	TNK (mg)	Volume TNK to be administered (ml)
< 60	30	6
≥ 60 to < 70	35	7
≥ 70 to < 80	40	8
≥ 80 to < 90	45	9
≥ 90	50	10

OR

Reteplase (rPA) regimen
10 units IV over 2 minutes given twice at 30-minute intervals.

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

OTHER MEDICATIONS:

1. Heparin:
   a. Bolus at initiation of TNK or rPA - 60 IU/kg IV bolus (maximum 4,000 IU).
   b. 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
- ❒ Pregnancy

Successes:

- State resources already addressing regionalization of STEMI and Stroke care
  - Legislative initiatives
  - OEMS
  - Grants
- Regions exist for STEMI and Networks exist for Stroke
- Data platforms already exist
- Best treatment options are being built into plans

Regional Systems of Care for Out-of-Hospital Cardiac Arrest : A Policy Statement From t he American Heart Association

we believe **that the time has come** for a call **to develop and implement** standards for **regional systems of care for** those with restoration of circulation after **OOHCA**; concentrate **specialized** post resuscitation skills in selected **hospitals**; transfer unconscious post– cardiac arrest patients to these hospitals as appropriate; **monitor, report**, and try to **improve** cardiac resuscitation **structure, process**, and **outcome;** and reimburse these activities.

Circulation. **2010;121:709-729;**

Successful implementation and maintenance of cardiac resuscitation systems of care would have a significant and important impact on the third-leading cause of death in the United States.

The time to implement these systems of care

IS NOW!

Agree to Participate:

- This is a grass roots effort
- Informal process
- No contract required

EMS Participation:

- Agree to participate
- Complete survey to understand current practice
- Participate in regional meetings
- Create/update order sets, protocols, etc., based on
  - AHA guideline recommendations, NC Operations Manual, Regional Plan, NCOEMS Protocols
- Agree to enter CARES registry data on cardiac arrest patients
- Engage First Responders and Dispatch in this project
- Implement improvement efforts as identified by your data

Hospital

- Post cardiac arrest care
  - Strong physician leader
  - Cardiac arrest team / coordinator
  - ICU / hypothermia / cath. / neurology protocols
  - Limited data measurement and feedback
- EP evaluation / Implantable defibrillators
- Community support / training

All Hospitals:

- Lead community education efforts
- Train all employees in some level of CPR based on job classification
  - Orientation and ongoing yearly training
- Train patient and families on recognition and compression only CPR on discharge

Survey:

- EMS Agencies and All hospitals
- RACE Coordinator will send to your contact to complete
- Understand current processes around cardiac arrest
- Use for regional, hospital, and agency specific plans
- Completion:
  - 76% PCI centers 16/21
  - 37% EMS 37/100
  - 31% Smaller facilities 31/100
- Complete Before and at the End of the Project to evaluate process changes

Regional Meeting:

- Understand resources
- Understand what EMS Agencies and Hospitals plans are for OOHCA
- Create regional plan based on input from all
- Consider Bypass and STEMI plans
  - If non PCI hospitals do not want to care for these cardiac arrest patients, EMS would implement their bypass plan if appropriate
  - Non PCI center still need a transfer process for STEMI patients – EMS could also bypass if appropriate
- Community Plans

Regional Plans:

- Sets expectations for best care of the cardiac arrest patient
- From Dispatch to Hospital Discharge
- Monitoring to make sure we have the best plan in place
- Adjust plans based on data and change in resources
- Decide on data, feedback, and review

Feedback:

- Who drives this process?
- What data to include?
- Individual Case Data
- Data over time

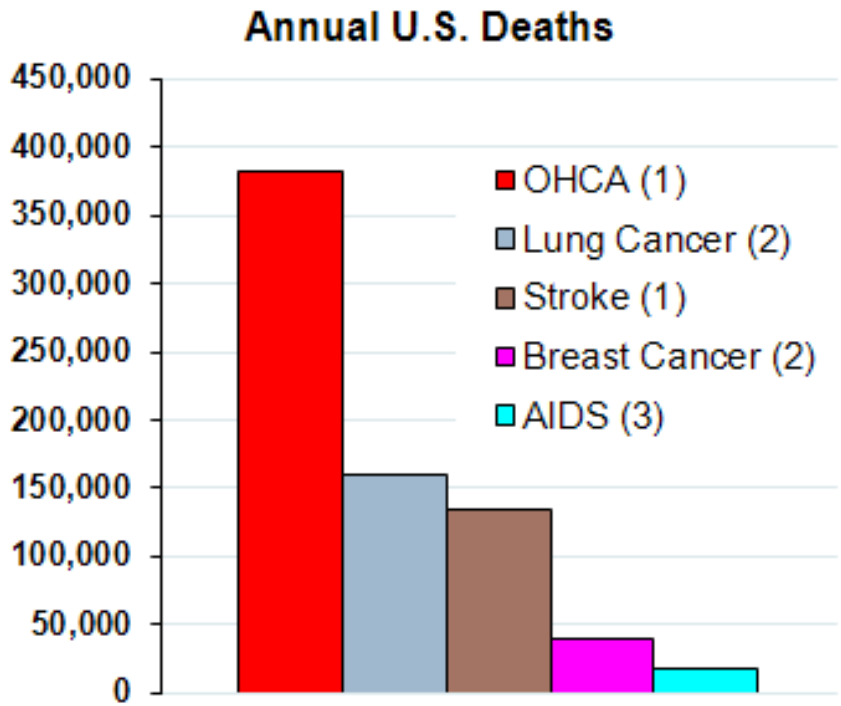
Data Review:

- What to review?
- How often to review?
- What format to review?
  - Meeting, call, written
- Case review

"Where you live should not determine whether you live"

HeartRescue PROJECT

Out-of-Hospital Cardiac Arrest: Overlooked Cause of Death



- Wide variance in local, regional, economic and ethnic survival rates
- Current data collection sporadic, minimizing motives for systemic improvement

(1) American Heart Association. Heart Disease and Stroke Statistics – 2012 Update.

(2) Cancer.org - 2012.

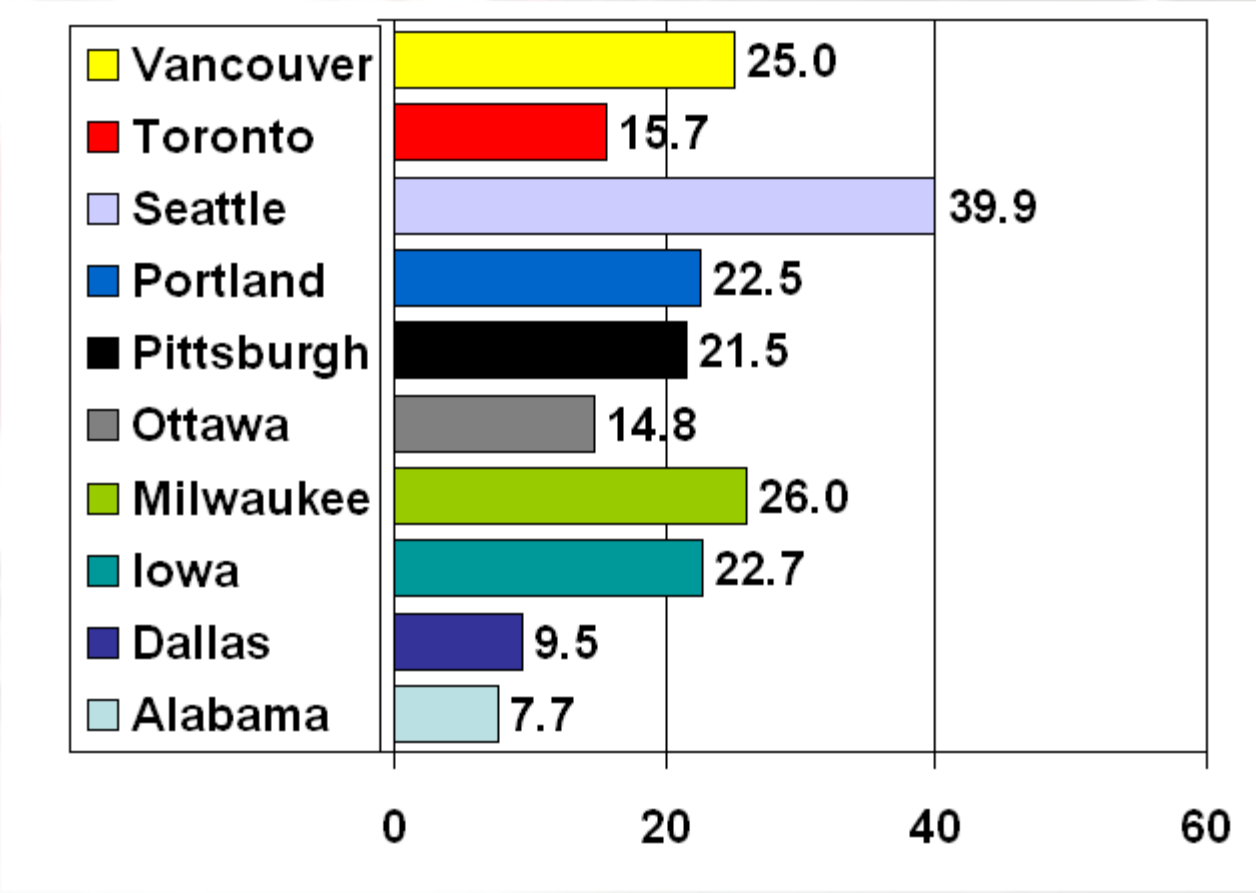
(3) U.S. HIV & AIDS Statistic Summary. Avert.org.

Medtronic FOUNDATION

Variation in survival VF arrest

Resuscitations Outcomes Consortium

Survival to discharge



Nichol JAMA. 2008;300(12):1423-1431

Cardiac arrest in North Carolina:

~ 5000-8000 per year (ED vs. EMS records)

NC Office of EMS Preliminary data

- Statewide Cardiac Arrests: 5,213
- EMS Return of Spontaneous Circulation: 1,845 (35%)
- Arrived at Emergency Department Alive: 1,034 (20%)
- Admitted to Hospital Alive: 589 (11%)
- Discharge from Hospital Alive :not available… likely under 5%

Cardiac arrest in North Carolina From the CARES Registry:

Bystander CPR	23%
AED Use	1.3%
Public CPR training	3% / year

32% Survival Rate

(Utstein criteria)

Original CARES data from Wake, Durham and Mecklenburg Counties

NC Success Stories:

- Pregnant Woman/School Teacher – Charlotte
- Legislator-Raleigh
- Police Officer - Yadkinville
- Baseball Coach-Winston-Salem
- Former Girl scout performs CPR-Durham
- Rural EMS: Stokes County Survival Rate 66%

HeartRescue PROJECT

HeartRescue Partners

HeartRescue PROJECT

Program Goals:

Goal 1: Improve Survival of Cardiac Arrest by 50% over 5 years in geographies we fund.
Goal 2: Increase and improve measurement of Sudden Cardiac Arrest.
Goal 3: Expand and improve national and global impact of the HeartRescue Project.

Program Results FY12- Q1FY13:

1. Partner programs now covering 50% or more of state populations, and reported on baseline and 2011 survival outcomes. **900 survivors reported in 2011.**
2. New partners in FY12 (AMR), and FY13 (University of Illinois)
3. All partners hosted 25 Resuscitation Academies and eLearning webinars reaching 1,000+ EMS/Hospital leaders with best practice education
4. Partners presented to 1,200 EMS leaders at 8 events to date.
5. 3 million people saved a life virtually with Save-a-Life Simulator on HeartRescueNow.com

Goals:

Program Goals

Improved Survival Rates

50% improvement in SCA survival in program states

- Partner grants

Improved Reporting

Increase and improve measurement of SCA nationwide

- Common data set and registry (CARES)
- SCA national index

Improved National and Global Impact

Expand nationally and internationally

- Expand grant program
- SCA Community Playbook

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CPC Score:

Cerebral Performance Category

GOAL-ALIVE WITH GOOD NEURO OUTCOMES

The level at the time of discharge

Level 1: Alert, able to work and lead a normal life.

Level 2: Conscious and able to function independently, but may have hemiplegia, seizures, or permanent memory or mental changes.

Level 3: Conscious, dependent on others for daily support, functions only in an institution or at home with exceptional family effort.

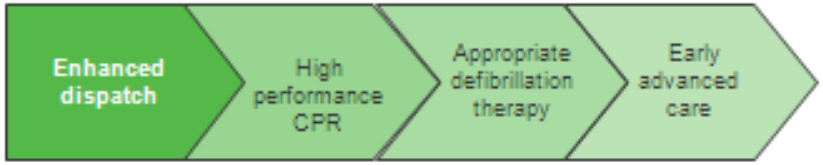
Level 4: Coma, vegetative state.

How to improve:

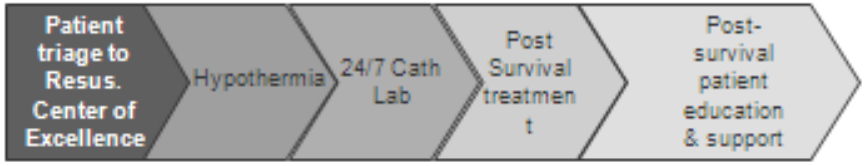
Improving SCA Survival

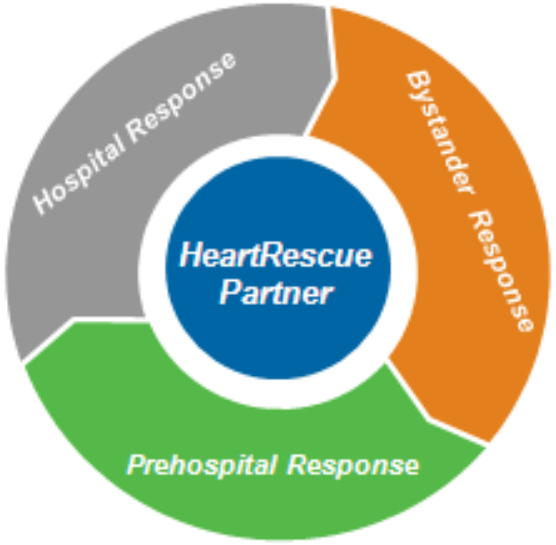
1: Bystander Response

2: Prehospital Response



3: Hospital Response





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Strategies for improving survival

- Medical leadership
- Community
  - Bystander CPR
  - Public access defibrillation
- 911 dispatch
  - Rapid first response
  - Dispatch assisted CPR
- EMS
  - High quality CPR
  - Early defibrillation
- Hospital
  - Specialized centers for treating post–cardiac arrest patients
  - Multidisciplinary post–cardiac arrest care treatment plan
  - Early PCI
  - Therapeutic hypothermia
  - Early hemodynamic optimization
  - AICD placement

Circulation. 2011;123:2898-2910

AHA Guidelines:

Adult Chain of Survival

1. Immediate recognition of cardiac arrest and activation of the emergency response system
2. Early CPR with an emphasis on chest compressions
3. Rapid defibrillation
4. Effective advanced life support
5. Integrated post–cardiac arrest care

Why treat with TH?

- With TH, cell metabolic rate decreases 6 – 7 % for every 1^0 C lowered temp
- ↓ cell metabolism leads to ↓ O_2 consumption
  - TH slows neuroexitatory processes
    - Leads to ↓ in disruptions in blood brain barrier and prevents premature cell death
  - TH ↓ many chemical rxns, including free radical production
  - TH ↓ inflammatory response (by decreasing activity of neutrophils and macrophages)

Trial Outcomes

Alive at hospital discharge with favorable neurological recovery

	Hypothermia	Normothermia	P Value
HACA	53%	36%	.006
Bernard	49%	26%	.052

Alive at 6 months with favorable neurological recovery

	Hypothermia	Normothermia	P Value
HACA	52%	36%	.009

Who to Cool?

American Heart Association®
Learn and Live℠

Part 9: Post–Cardiac Arrest Care

2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care

Mary Ann Peberdy, Co-Chair*; Clifton W. Callaway, Co-Chair*; Robert W. Neumar; Romergryko G. Geocadin; Janice L. Zimmerman; Michael Donnino; Andrea Gabrielli; Scott M. Silvers; Arno L. Zaritsky; Raina Merchant; Terry L. Vanden Hoek; Steven L. Kronick

Class I, LOE B All comatose patients with ROSC after out-of-hospital VF cardiac arrest should be cooled to 32 – 34° C for 12 – 24 hours.

Class IIb, LOE B Induced hypothermia also may be considered for comatose adult patients with ROSC after in-hospital cardiac arrest of any rhythm or after out-of-hospital cardiac arrest with an initial rhythm of pulseless electrical activity or asystole

Who to Cool?

RACE Ops Manual Recommendations

- After cardiac arrest due to VF, all intubated pts should receive TH unless:
  - The pt can follow verbal commands
  - > 8 hours have since ROSC
  - Life threatening bleeding or infection
  - Cardiopulmonary collapse is imminent, despite vasopressor support
  - Refractory hemodynamically significant arrhythmias
  - Aggressive care not warranted
- Also consider TH following cardiac arrest due to PEA or asystole

Who to Cool?

NCOEMS Protocol

- Criteria for TH:
  - Any presenting rhythm is eligible
  - Advanced airway (including BIAD) in place with no purposeful response to verbal commands
  - Initial temp > 34^0 C
  - Non traumatic or hemorrhage arrest
- Relative contraindications:
  - Pregnancy
  - Sepsis

When to Cool

Best time to initiate TH and the optimal duration of cooling is not well defined

Overall thought:

- Reasonable to initiate cooling as soon as possible to maximize benefits
  - Injury to the brain starts within minutes
  - Benefits of cooling have been shown with delayed initiation

Code Cool

1. Induction

2. Maintenance

3. Rewarming

Carolinas Medical Center (CMC)

Therapeutic Hypothermia Post Cardiac Arrest

CMC Critical Care Committee

Initiate: CMC Therapeutic Hypothermia Post Cardiac Arrest
Verify Allergies:_____

Admit to: ICU under Dr.: _____ **List:** _____
Diagnosis: Cardiac Arrest
Condition: Critical
Notify Paging Operator at 355-2443 to activate Code Cool

Consults

Pulmonary and Critical Care Consultants (PCCC) ; page #3767 immediately, unless previously notified
Sanger Cardiology
Physical Medicine and Rehabilitation - List 66287
Activate Group Page 8760 for family support referral

Treatment Parameters

Refer to: **CMC Therapeutic Hypothermia After Cardiac Arrest Guideline**
Goal Temperature 33° C
Minimize FiO_2 to maintain SpO_2 greater than 95%
Maintain Mean Arterial Pressure (MAP) greater than 65 mmHg
Maintain $PaCO_2$ of 38 - 42 mmHg

Pharmacy/Treatments and Interventions Weight: _____ kg
Hold all orders for Beta Blockers and Antihypertensive medications
Maintenance IV Fluids: _____ at _____ ml per hour
Norepinephrine (Levophed) 5 mcg/min; titrate to maintain MAP greater than 65 mmHg

Induction Phase (if not completed in the ED)
Place Temperature monitoring Foley catheter
Initiate refrigerated (4 ° C) IV NS 30 ml/kg bolus over 1 hour as tolerated
Apply Cooling Device with goal temperature set to 33° C

Pantroprazole (Protonix) 40 mg IV Q24H; first dose upon admission to ICU

Shivering Protocol
Initiate sedation per **CMC Sedation and Analgesia for the Mechanically Ventilated Non Paralyzed Patient** (MD to initiate)
For refractory shivering: Vecuronium (Norcuron) 0.1 mg/kg IV Push Q1H PRN shivering

Maintenance Phase
Maintain temperature of **33° C for 24 hours** via Cooling Device

Re-warming Phase
Begin controlled re-warming **at less than 0.5° C per hour** to 37° C via Cooling Device
Discontinue sedation once 36° C is achieved
Cooling Device to remain operational with goal temperature of 37° C until order received to discontinue
____ Refer to: **CMCC Subcutaneous Insulin Orders for the Non-Pregnant Patient** (MD to initiate)
Implement: SO CMC Tight Glucose Control for the Adult Patient in MICU SICU TICU DHU CVRU or Neuro ICU (EndoTool®) if 2 consecutive blood glucose checks greater than 150 mg/dL

EMS & TH

- Trial evaluated efficiency and efficacy of pre-hospital TH
- Cooled ROSC patients in the field with 4^0C Saline
- Found it safe and feasible
- Effective at lowering temp
  - Expect a ↓ of 1.7 - 2^0C with 2L cool saline
  - Pre-hospital cooling <u>not</u> associated with adverse consequences in terms of
    - BP, HR, arterial oxygenation, pulmonary edema, or re-arrest

Pilot Randomized Clinical Trial of Prehospital Induction of Mild Hypothermia in Out-of-Hospital Cardiac Arrest Patients With a Rapid Infusion of 4°C Normal Saline

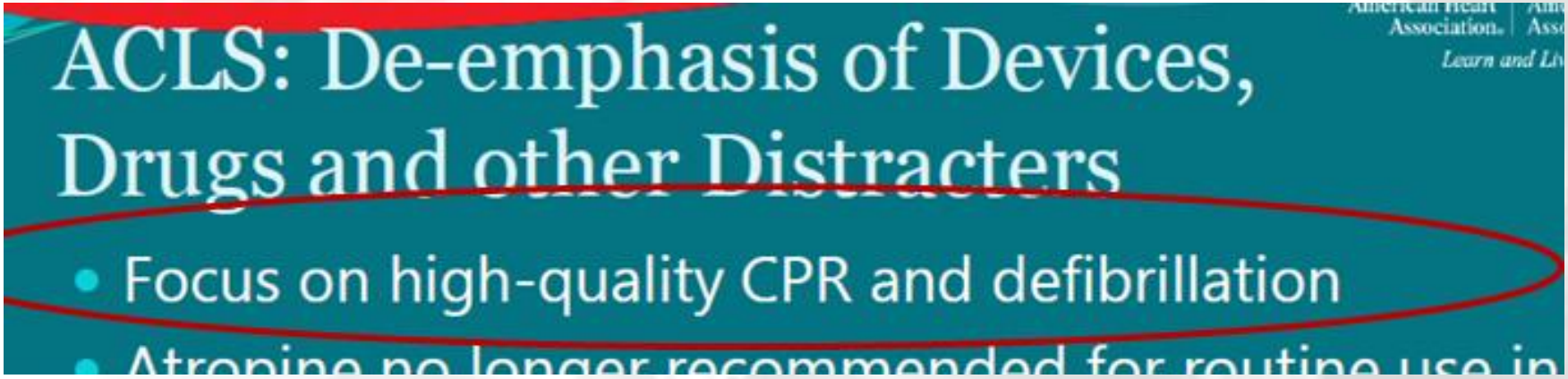
Francis Kim, Michele Olsufka, W.T. Longstreth, Jr, Charles Maynard, David Carlbom, Steven Deem, Peter Kudenchuk, Michael K. Copass and Leonard A. Cobb

American Heart Association | American Stroke Association
Learn and Live

Summary of 2010 Guidelines

- Many resuscitation systems and communities have documented improved survival from cardiac arrest.
- Too few victims of cardiac arrest receive bystander CPR.
- CPR quality must be high.
- Victims require excellent post–cardiac arrest care by organized, integrated teams.
- Education and frequent refresher training key to improving resuscitation performance.
- We must rededicate ourselves to improving the frequency of bystander CPR, the quality of all CPR and the quality of post–cardiac arrest care.

HIGH QUALITY CPR

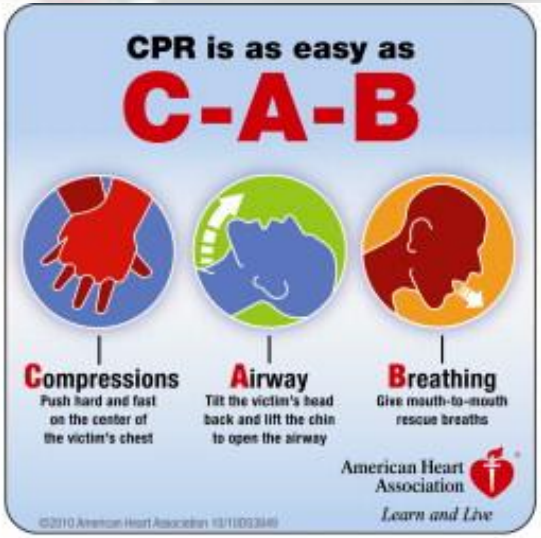


High Quality CPR

- Goal: high quality and continuous chest compressions with *limited interruptions*
  - Rate: 100 – 120/min
  - Depth: 2 inches
  - Allow for complete chest recoil
  - Change every 2 minutes with pulse check
    - not to exceed 5 seconds
  - Address airway after unless indicated earlier

High Quality CPR

- Best chance for survival from OOHCA:
  - Early, continuous compressions and early defibrillation
  - Don't interrupt chest compression for inserting airway
    - Adult takes 10 – 15 minutes to de-saturate below 80%



Ventilation

- Recommended rate: 8 – 10/min
- Maintain SpO2 > 95%
- Avoid Hyperventilation
  - Worsens brain ischemia by inducing cerebral vasoconstriction as PaCO2 falls
  - Hyperinflation of the chest

    → increased intrathoracic pressure

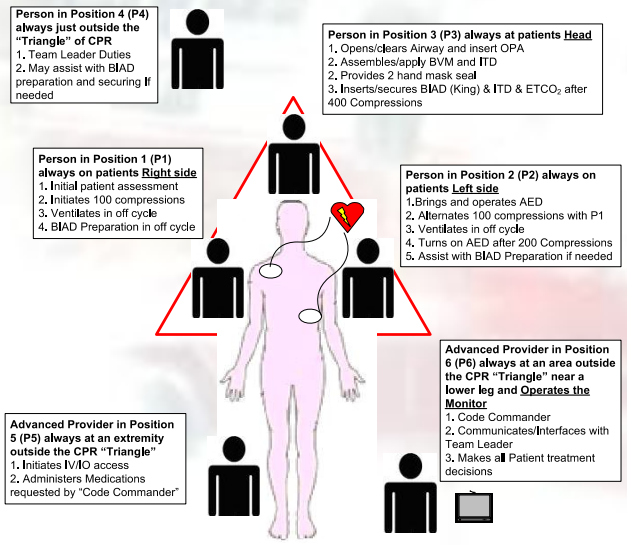
    and

    → impedes venous return to heart, affecting BP

Pit Crew Approach to Resuscitation

- Focus on:
  - Leadership, team approach, skills & competencies, communication & teamwork, best practices, and rehearsal
- Emphasis on:
  - Minimally interrupted CPR
  - Controlled ventilations
  - Defibrillation
  - Appropriate timing of interventions

Pit Crew Approach



Pre-assigned Roles

1. Pit Crew Leader
2. Airway Leader
3. IV/IO & Medications
4. CPR Chief
5. CPR Duty Chief
6. Variable Player

- Each person has assigned role
  - Providers focus on their assigned job expertly and efficiently
  - Practice in each role
  - Helps minimize interruptions

Variations to this model exist for:

3 Rescuers
4 Rescuers
5 Rescuers
6 Rescuers

How to Implement:

- How are you training staff today for CPR?
- Simple training around concepts of CPR
- Practice High Quality CPR
- Adopt on scene resuscitation practice

How to Implement:

- Define roles for the team approach
  - Ask staff for input
- Educate on the roles
- Practice running resuscitation with the new roles
- Engage First Responders, practice with them

Did it work?

- Review each arrest
  - Did wells
  - Opportunities to improve
- Discuss quality of CPR
  - Machine review if possible
- Share metric times with all
- Discuss any changes that need to be made

Considerations:

- Measure what matters
- Make cardiac arrest a public health crisis
- Share your data within you community
  - Leverage support for your efforts
  - May lead to additional funding
  - Need community response to improve survival rates

myCARES.NET

myCares.NET™

Welcome To:

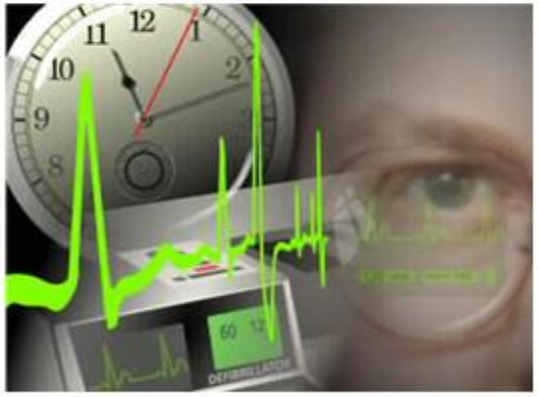
Cardiac Arrest Registry to Enhance Survival (CARES)

Sponsored by:

CDC Department of Health and Human Services Centers for Disease Control and Prevention

EMORY UNIVERSITY SCHOOL OF MEDICINE

American Heart Association. Learn and Live.



Log In to myCares™

Username:

Password:

Log In

Did you forget your password?

CARES Introduction

More information on Cares

Press on Cares

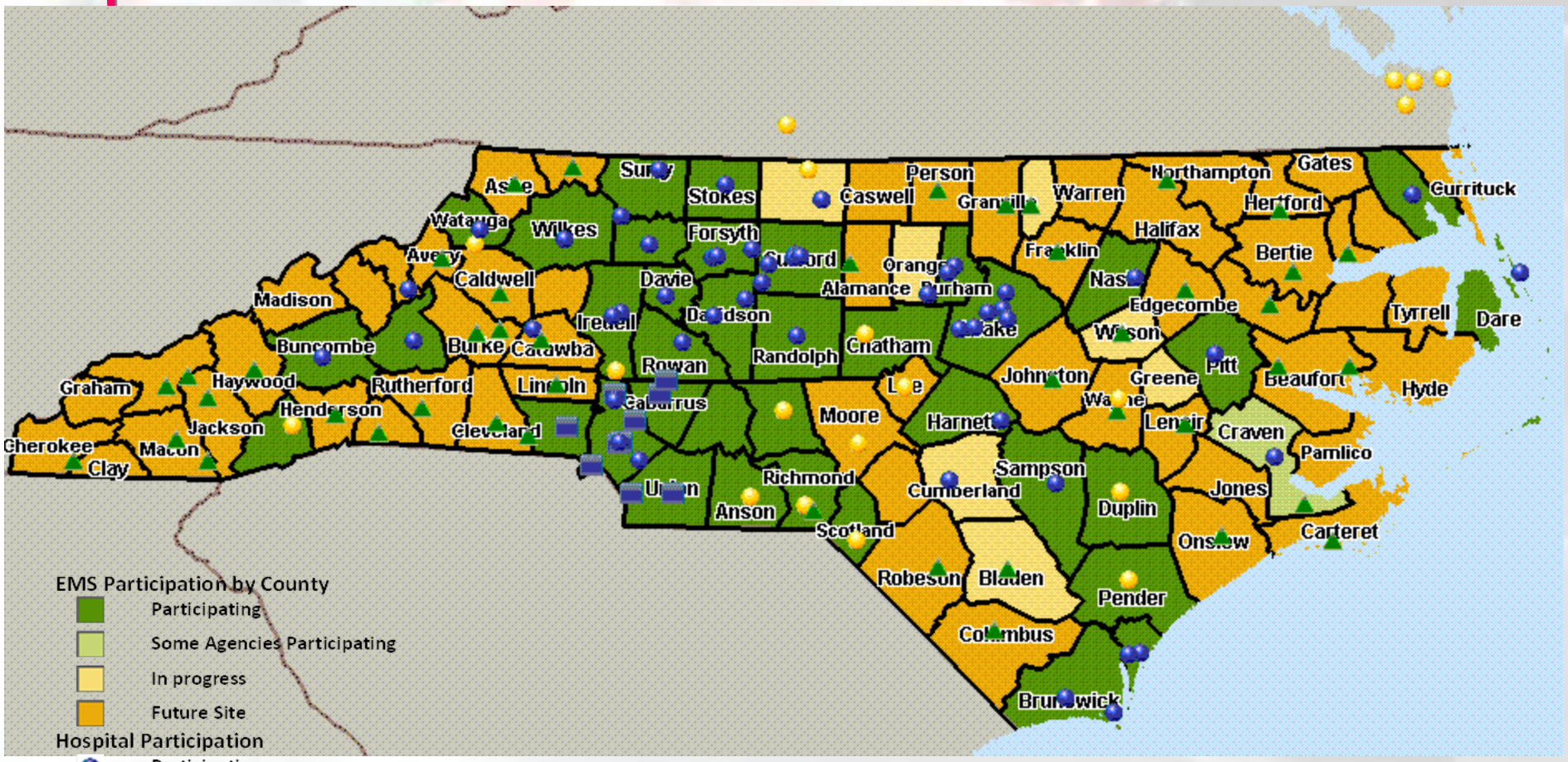
Maps

IRB/HIPAA

CARES

The Cardiac Arrest Registry to Enhance Survival (CARES) was initiated in October 2004 as a cooperative agreement between the Center for Disease Control and Prevention (CDC) and the Department of Emergency Medicine at Emory University School of Medicine to identify incidents of prehospital cardiac arrest. The CARES Program is designed to consolidate all essential data elements of a prehospital cardiac arrest event in an efficient manner. With this standardized collection system, participants can track ongoing system performance in several, tailored reports. If

CARES Participation:



11-6-2012

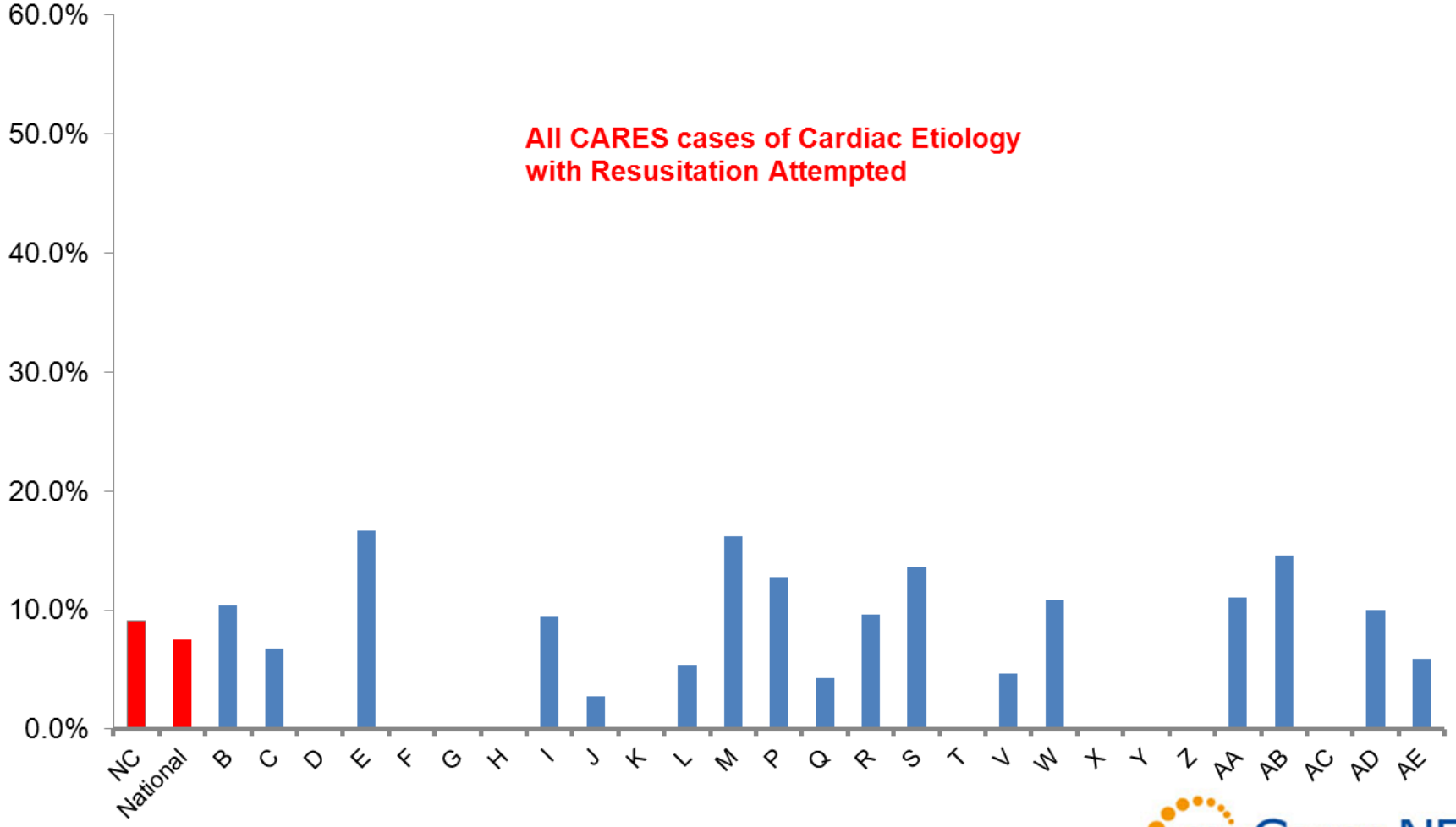
CARES Participation:

	Number	% Population	Cumulative Population
EMS Systems in NC	100	100%	
EMS Systems reporting into CARES	36	63.01%	63.01%
EMS Systems in Progress	9	8.85%	71.86%
Future EMS Systems	55	28.91%	100
Cases in the CARES (Audited)			
Total 2010	1643		
Total 2011	1911		
Total 2012	1829		
Grand Total to date	5383		
Hospitals in CARES			
Hospital identified by EMS as destination	79		
Hospitals Trained	56		
Hospitals with data in system	42		

North Carolina CARES
Overall Survival
Year to Date 2012
September 26, 2012

RACE
Cardiac Arrest Resuscitation System

HeartRescue PROJECT
Every second counts. Every action matters.



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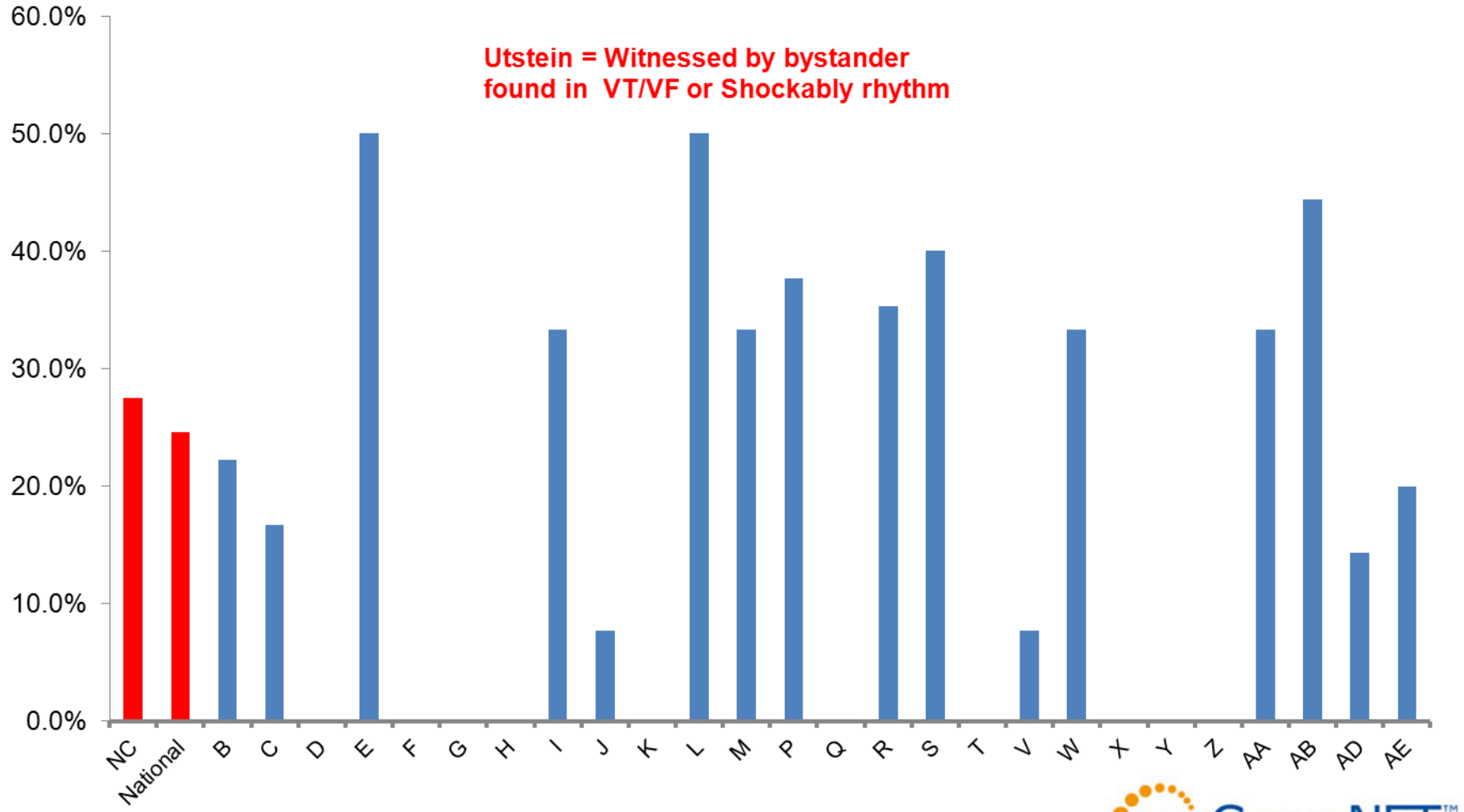
North Carolina CARES
Utstein Survival
Year to Date 2012
September 26, 2012

RACE
Cardiac Arrest Resuscitation System

HeartRescue PROJECT
Every second counts. Every action matters.



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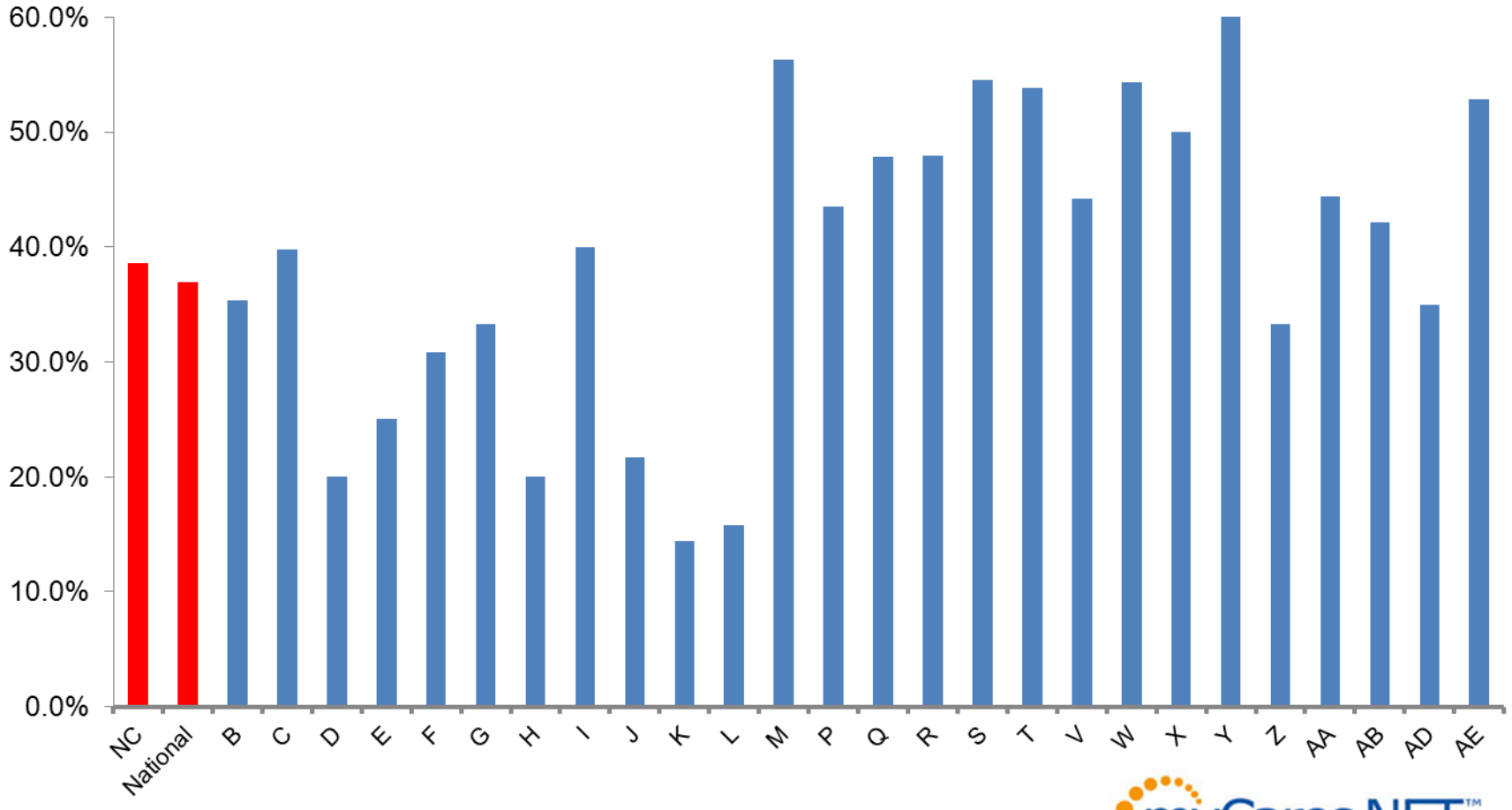
North Carolina CARES
Bystander CPR
Year to Date 2012
September 26, 2012

RACE
Cardiac Arrest Resuscitation System

HeartRescue PROJECT
Every second counts. Every action matters.



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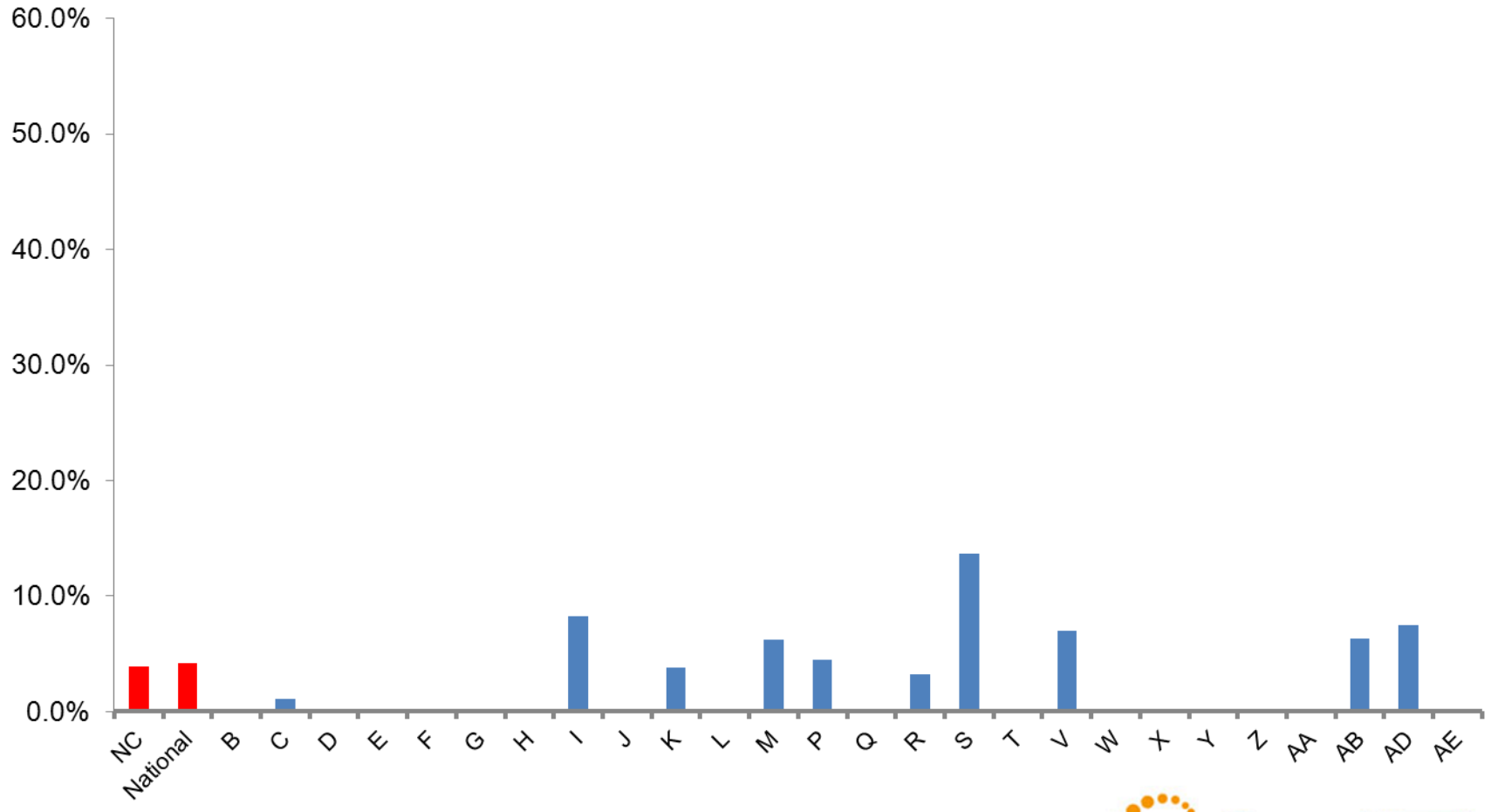
North Carolina CARES
Bystander AED Application
Year to Date 2012
September 26, 2012

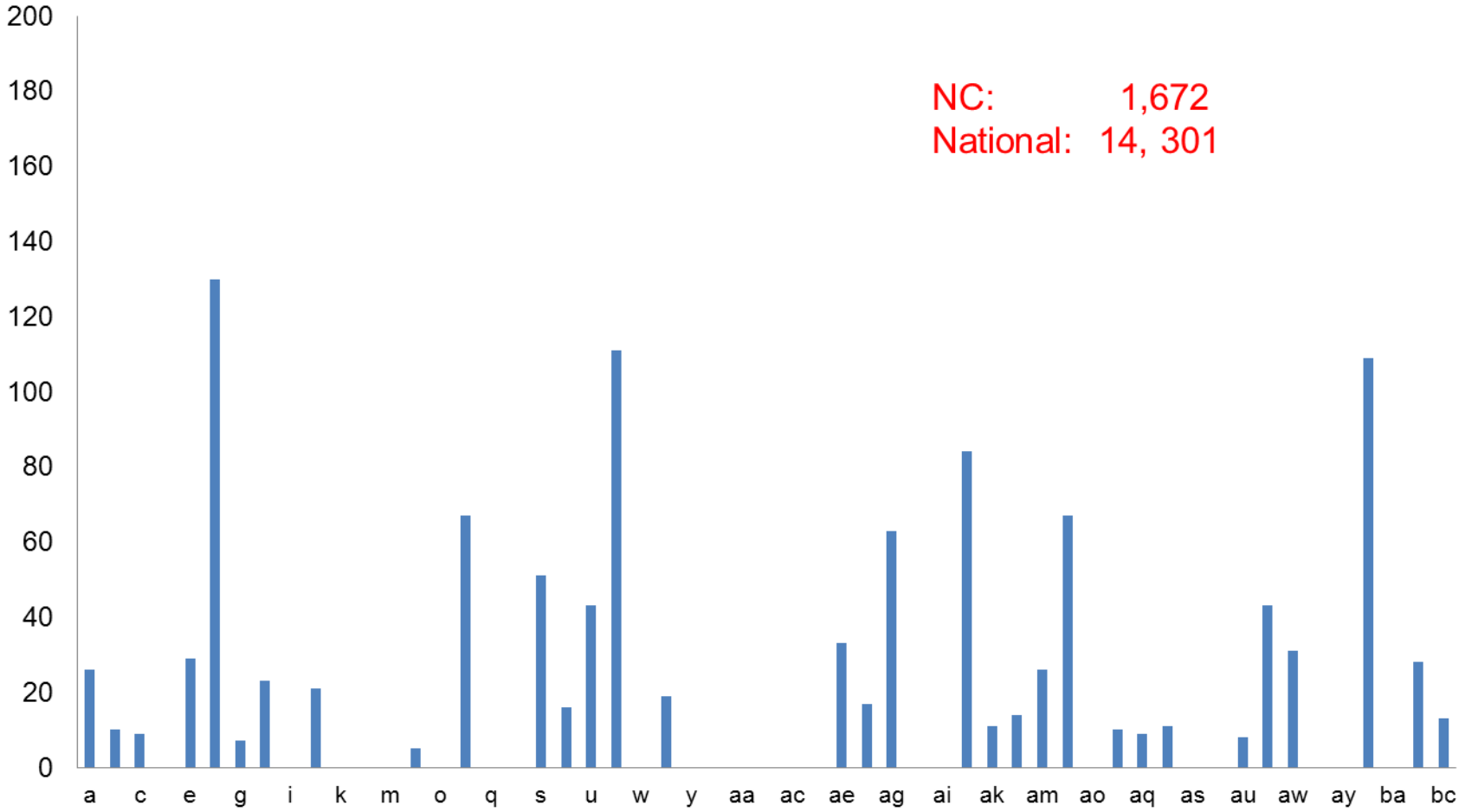


Hospital Reports:

Hospital:

- CARES hospital data is limited:
  - Dies in ED – 1 element
  - Survives to DC – 10 elements
- Consider voluntarily entering into the INTCAR registry

North Carolina CARES
Cases Transported to the Hospital
Year to Date: 2012
September 26, 2012



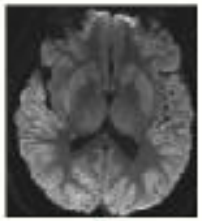
NC: 1,672
National: 14, 301

Volumes	
National	14, 301
NC	1672
Transported to Hospital	1191
Pre-Hospital	
ROSC In Field	614
Hypothermia in Field	535
ED	
Dead in ED	270
Ongoing Resus in ED	864
Admitted to Hospital	364
In-hospital	
STEMI	
Yes	84
No	291
Unknown	502
Blank	314
MI	43
Hypothermia in Hospital	194
Angio	60
Stent	26
ICD	26
CABG	1
Outcomes	
Died in Hospital	144
DC Alive	149
DC Neuro Intact	125
DNR during Stay	69
Incomplete Cases	**298**

INTCAR:

- International Registry for Cardiac Arrest Registry
- http://www.intcar.org/
- is a joint venture of hospitals, research societies and individuals dedicated to improving post-resuscitation care for cardiac arrest survivors.
- allows members to participate in research groups of their own design and choosing

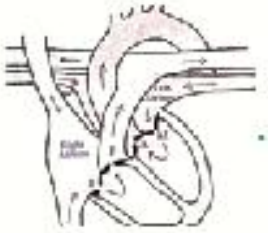
Neuroimaging



Prognostication

Cardiology

Core data set



Hemodynamics

Seizures and EEG

Methods/ Complications

Core Set:

- 108 data elements
- 2 hours to abstract and enter
- Clinical abstractor
- Subset Example:
  - The Cardiology group was developed to evaluate the relationship between cardiac features of cardiac arrest and outcome, and was founded in 2009.

Primary Function of the Registry

- Collect data
  - HOW and on WHOM is hypothermia being performed after Cardiac Arrest
  - Characteristics of the patients
  - Utilization of PCI, EEG, MRI, etc
  - Outcomes
- Return reports to member institutions for internal QI purposes, compare outcomes and practices to norms within the registry

Secondary Functions

- Research within the registry
  - Requires approval and cooperation of the steering committees
- "Networking" function to connect centers
  - Research groups
  - Provide support for new sites

Acta Anaesthesiol Scand 2009; 53: 926–934
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ACTA ANAESTHESIOLOGICA SCANDINAVICA

Outcome, timing and adverse events in therapeutic hypothermia after out-of-hospital cardiac arrest

N. Nielsen, J. Hovdenes, F. Nilsson, S. Rubertsson, P. Stammet, K. Sunde, F. Valsson, M. Wanscher and H. Friberg, for the Hypothermia Network

Acta Anaesthesiol Scand 2009; 53: 926–934

INTCAR Commitment

- Identify a principle investigator and data coordinator
- Report ALL unconscious patients admitted to your ICU, ICU group, or hospital with a primary diagnosis of cardiac arrest*
  - Even if not treated with hypothermia
- PI should maintain contact with INTCAR administrator, and must take responsibility for high quality data entry

Registration

- Go to the INTCAR or the Neurocritical Care Society website and follow registration instructions
- Seek exemption from local IRB to enter fully de-identified patient data
- Administrator will contact you by email, conduct a brief telephone interview, and provide you with a logon and password
- Review the “test patient” field
- Discuss data questions with administrator
- Begin entering patient data for ALL comatose survivors of cardiac arrest admitted to your institution

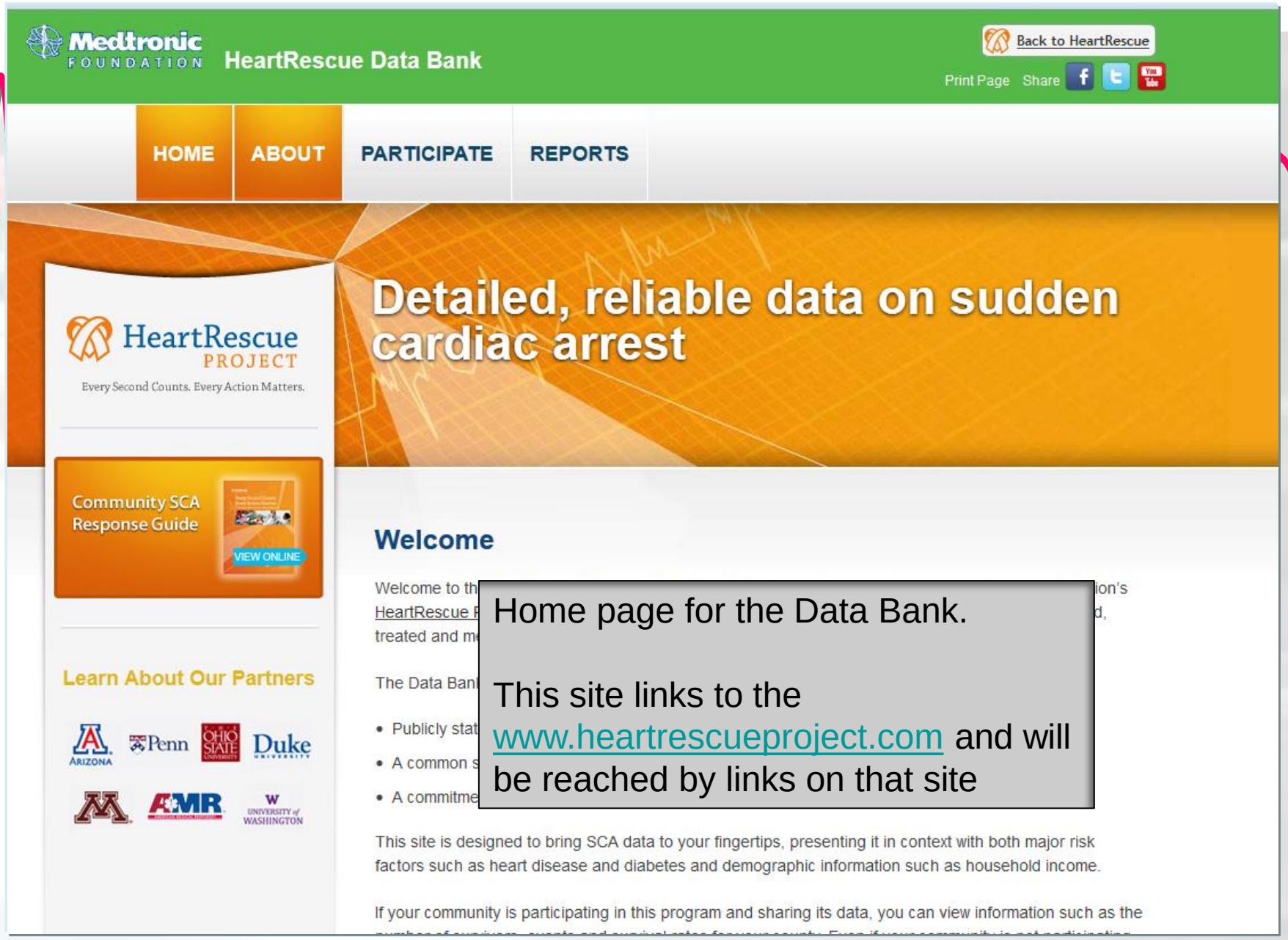
Database Management

- Submit to INTCAR
- Develop a standing database to pull data back locally
- Develop reports to be generated for Quality Improvement
- Research questions addressed by query
- May add fields locally

Community Reporting:

Public Health Crisis:

- have significant impacts on community health, loss of life, and on the economy
- Need transparency of data
- Creates accountability
- Can help leverage resources


Medtronic FOUNDATION
HeartRescue Data Bank
Back to HeartRescue
Print Page
Share
HOME
ABOUT
PARTICIPATE
REPORTS
HeartRescue PROJECT
Every Second Counts. Every Action Matters.
Detailed, reliable data on sudden cardiac arrest
Community SCA Response Guide
VIEW ONLINE
Welcome
Learn About Our Partners
ARIZONA
Penn
OHIO STATE
Duke
AMR
UNIVERSITY of WASHINGTON
Home page for the Data Bank.
This site links to the www.heartrescueproject.com and will be reached by links on that site
This site is designed to bring SCA data to your fingertips, presenting it in context with both major risk factors such as heart disease and diabetes and demographic information such as household income.
If your community is participating in this program and sharing its data, you can view information such as the

	Massachusetts: Plymouth
Demographics	
1. Median Age	40.9
2. Median Household Income	72,634
3. Percent of Population with Bachelors Degree or Higher	32.5%
4. Population	494,919
5. Population Density	750.9
Out-of-Hospital Cardiac Arrest Response	
Bystander	
6. Bystander CPR	28
7. Bystander CPR - Rate	39.0%
8. Witnessed Events - Bystander	71
Pre-Hospital	
9. Arrests - Cardiac etiology	291
Hospital	
10. Treatment Provided - Number	76

This table of data is display (continued on next slide.)

Hospital	
10. Treatment Provided - Number	76
Risk Factors	
11. Cardiovascular Deaths (per 100,000 population)	241.3
12. Diabetes Prevalence Rate	8.3%
13. Heart Attack Prevalence Rate	5.1%
14. Heart Disease Prevalence Rate	4.2%
15. Obesity Prevalence Rate	23.1%
16. Smoking Rate (percent of adults that smoke)	19.9%
Survival	
17. Events - VT / VF	119
18. Shockable Rhythm Survival Rate	46.0%
19. Survival Rate - Overall	26.5%
20. Survivors, Total	77

Data Notes

1. Source: U.S. Census Bureau American Fact Finder
2. Source: U.S. Census Bureau American Fact Finder
3. Source: U.S. Census Bureau American Fact Finder

	Massachusetts: Hampshire	Massachusetts: Plymouth
Demographics		
1. Median Age	36.2	40.9
2. Median Household Income	59,591	72,634
3. Percent of Population with Bachelors Degree or Higher	42.4%	32.5%
4. Population	158,080	494,919
5. Population Density	299.8	750.9
Out-of-Hospital Cardiac Arrest Response		

A county to county(s) comparison would list the data side by side where it is available.

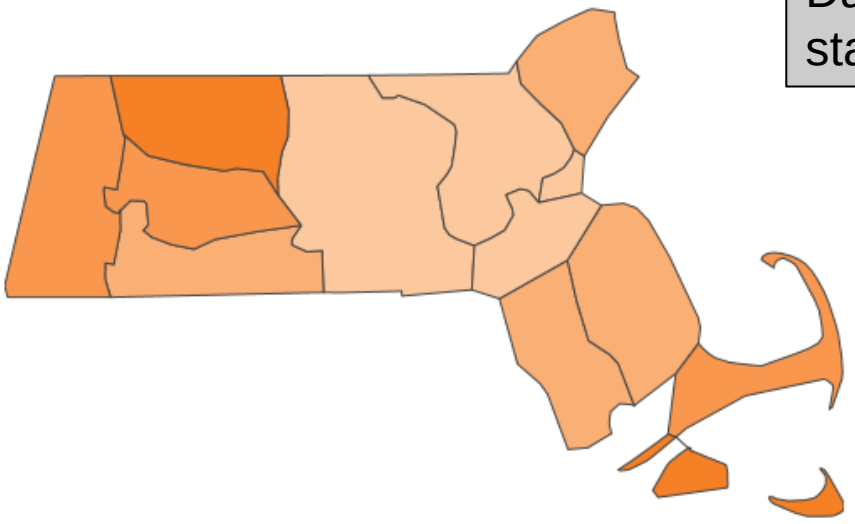
You can compare up to four counties.

		Compared with counties in the same Median Age quartile		
	Massachusetts: Plymouth	**Low**	**Median**	**High**
Demographics				
1. Median Age	40.9	37.4	39.8	41.0
2. Median Household Income	72,634	14,916	41,007	95,563
3. Percent of Population with Bachelors Degree or Higher	32.5%	6.9%	32.1%	53.7%
4. Population	494,919	19,677	26,415	19,378,102
5. Population Density	750.9	3.4	5.9	4,704.8
Out-of-Hospital Cardiac Arrest Response				

Comparison to a group of counties would compare it to the low, median and high value among that group. (There must be at least five counties in the group for data to appear in the comparison columns.)

Location
Massachusetts

Data
Out-of-Hospital Cardiac Arrest Response, Bystander: Bystander CPR

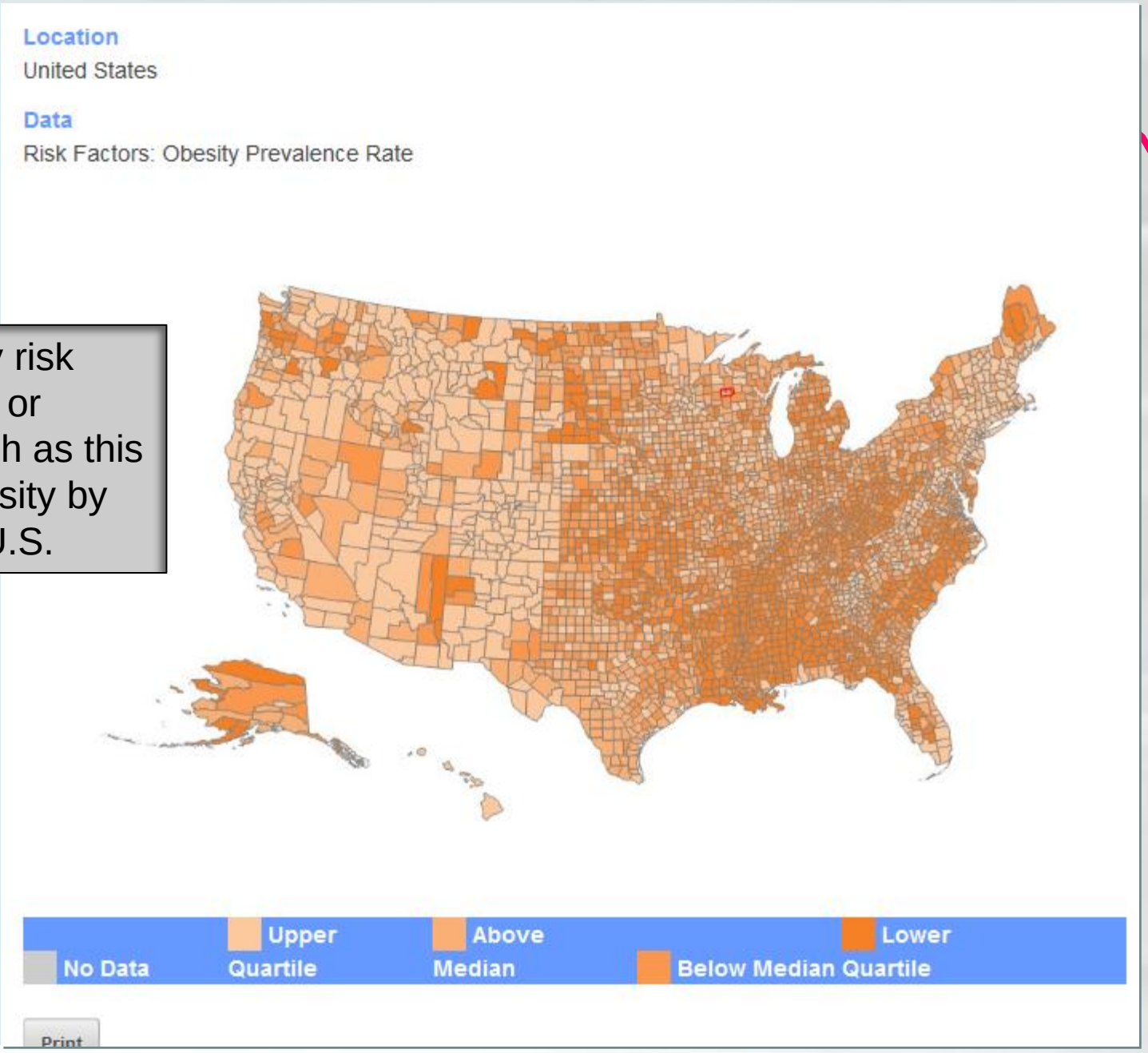


Data is displayed by quartile for the state.

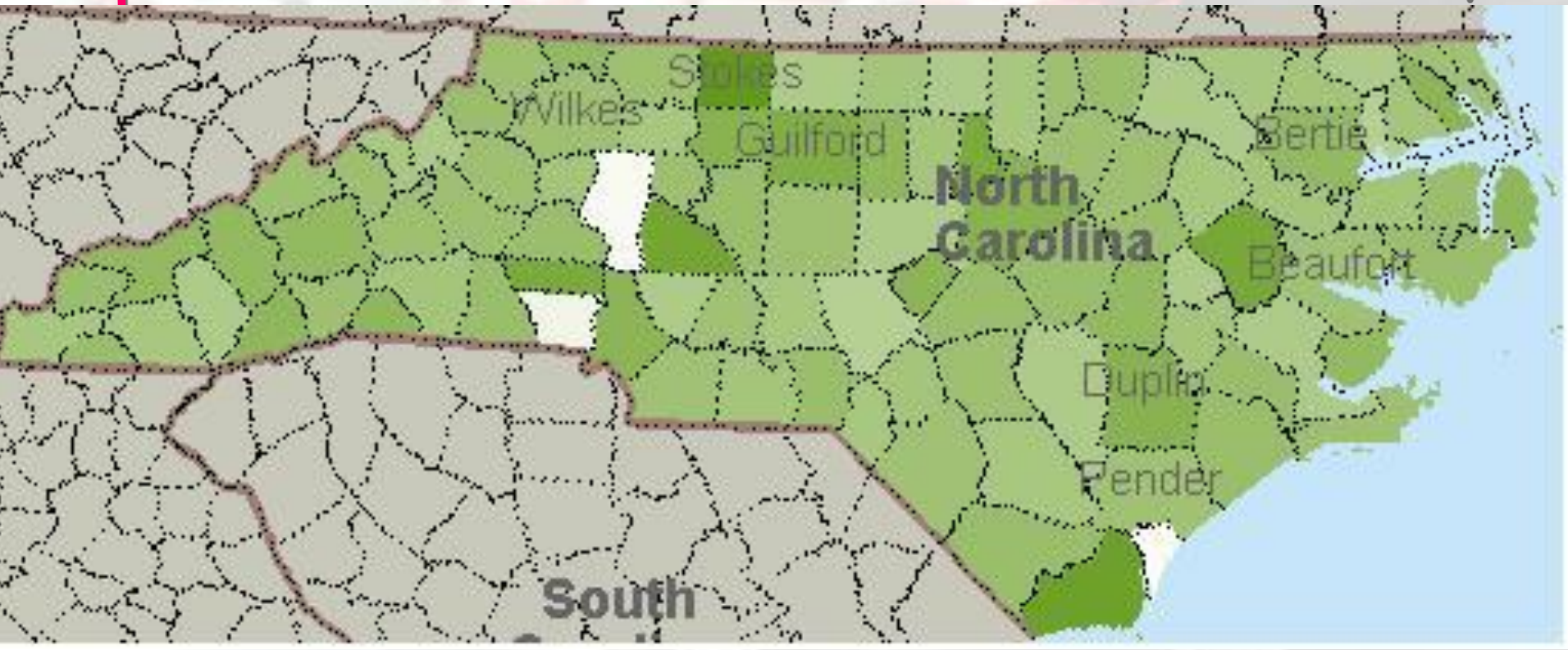
No Data | Upper Quartile | Above Median | Below Median Quartile | Lower Quartile

Print

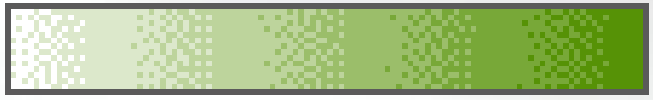
You can display risk factors by state or nationally – such as this example of obesity by county for the U.S.



Regional Trends



Utstein Style Survival Rates



0% 45%

Community Efforts:

Public Health Crisis:

- Have significant impacts on community health, loss of life, and on the economy
- Need transparency of data
- Creates accountability
- Can help leverage resources

North Carolina: RACE CARS

- Challenges
  - EMS response times vary from 4-10 minutes, rural communities even longer
  - Victim's need CPR started within 4 minutes or brain damage begins to occur
  - At 10 minutes, without CPR, survival is not likely
- You can help by learning:
  - Early recognition of SCA
  - Early Access – call 911
  - Early CPR

RACE
Cardiac Arrest Resuscitation System

Community Plans:

Goal: Increase the rate of bystander CPR and AED use

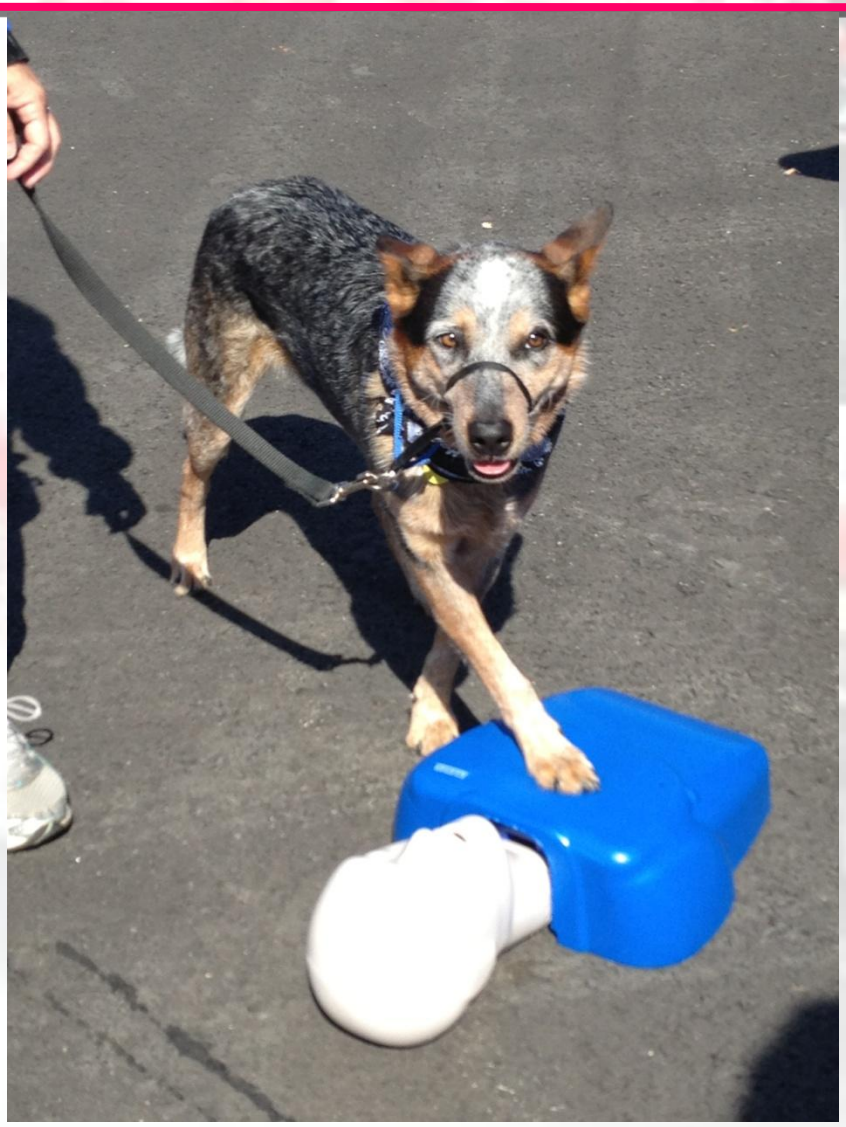
- Coordination by hospitals
  - Survey to understand what resources exist today
- Certification vs Education
  - AHA/Red Cross
  - RACE CARS developed materials
- AED devices – funding and identification
- Train all hospital employees of some level of CPR
- Train all heart patients and families on discharge

EMS, First Responders, and Hospitals will work together to off community education

Compression Only CPR:

- **Check**
  - If your victim is not responsive or breathing normally
- **Call 9-1-1**
- **Compressions**
  - Place victim on back on hard surface
  - Kneel next to victims side
  - Place heal of hand in center of chest
  - Place other hand on top and interlock fingers
  - Push hard, about 2 inches
- Push fast, as least 100/minute
- Switch every 2 minutes, it’s very tiring

SO EASY A DOG CAN DO IT!

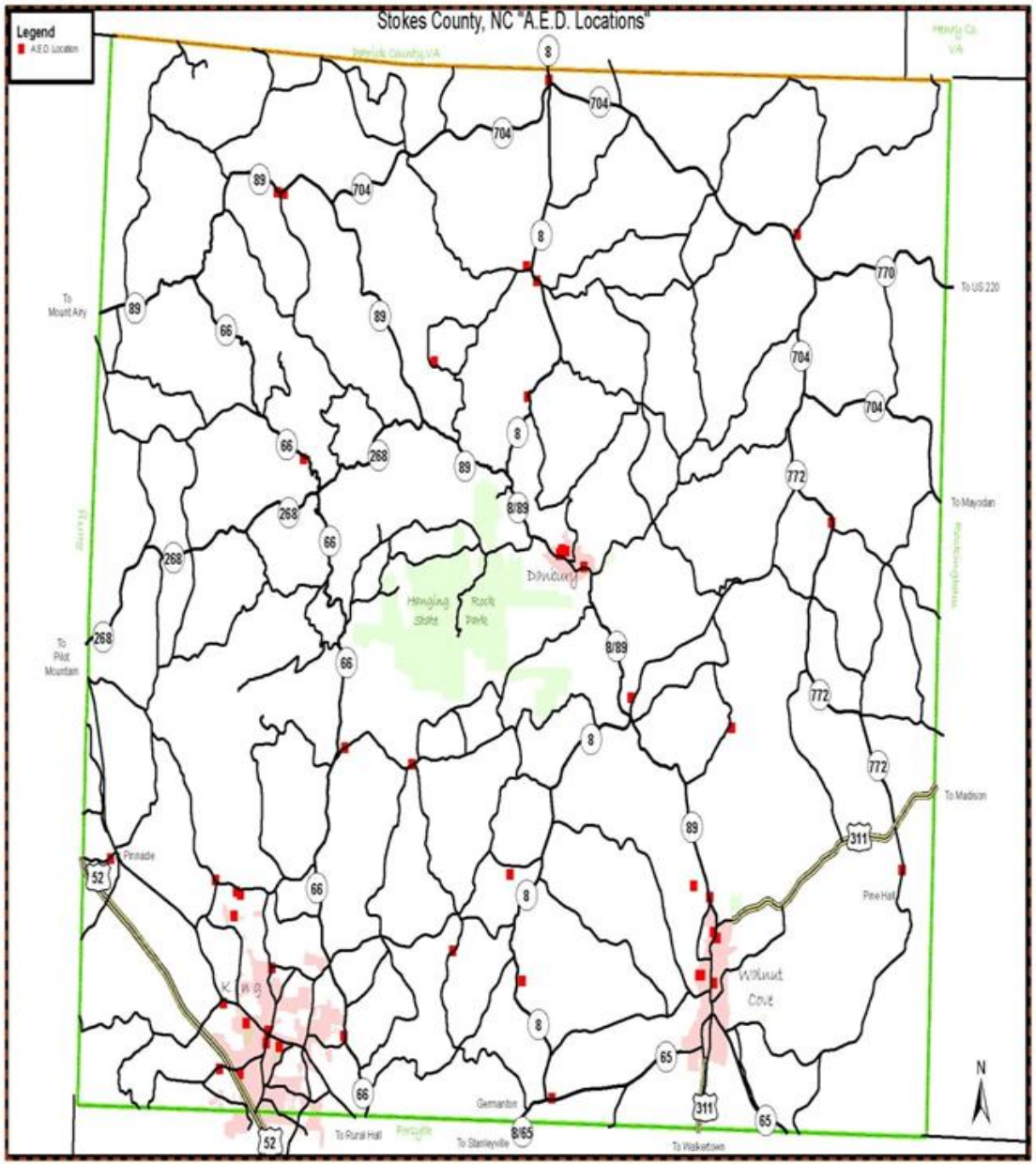


AED:

- If someone else is with you, get the AED while the other does CPR
- Open the AED and follow the prompts
- The AED was meant for untrained rescuers to operate

STOKES

AED



Chances of survival decrease 10% for every minute of delay in defib

CPR < 4 or brain begins to die

If no CPR Brain Death at 10 minutes

Strong Hearts for NC Youth

Our mission is to create a safe environment for our students, staff, and visitors in North Carolina (NC) public and private elementary, middle and high schools.

- Securing funding for an AED
- Placing an AED in the school
- Implementing an Emergency Action Plan (EAP) in each school to respond in case of an emergency
- Tracking AED status in all schools
- Sending monthly reminders to check the AED pad expiration date and battery life
- Reporting location of AED's to local 9-11 Centers

Community Updates:

- House Bill 837 -passed
  - requires students to learn CPR
  - pass a test showing proficiency in order to graduate
  - Effective with the Class of 2015
- House Bill 914 -passed
  - requires at least one AED in every state building
  - state workers must be trained to use them

VIDEO:

- What happened to this person?
- Describe the actions of the bystander.
- Who was the first responder
- When did EMS get there

Adult Chain of Survival

1. Immediate recognition of cardiac arrest and activation of the emergency response system
2. Early CPR with an emphasis on chest compressions
3. Rapid defibrillation
4. Effective advanced life support
5. Integrated post–cardiac arrest care

Summary:

- Search the web address
- Click directly on the RACE CARS Icon
- Click on the tab menu across the top to access the information desired
- To access the document in the file, click directly on the wording

- Please send feedback to lisa.monk@duke.edu

Thanks for your time!

HeartRescue Flagship Premier Partner Program:

1st Chain: Community Response

i. Early SCA Recognition
ii. Early 911
iii. Early and effective bystander CPR or CCC
iv. Early Public Access to AED

2nd Chain: Pre-Hospital Response

i. Enhanced dispatch
ii. Enhanced/high performance CPR or CCC
iii. Defibrillation care (e.g. one shock therapy for VF patients)
iv. Pre-hospital hypothermia
v. Drug delivery (e.g. Intra-osseous drug delivery)

3rd Chain: Hospital Response

i. Patient triage to Resuscitation Center of Excellence
ii. Hypothermia as indicated by local protocol
iii. 24/7 Cath Lab
iv. Patient indicated therapies provided (e.g. ICD, PTCA, stent, CABG)
v. Post survival patient and family education and support

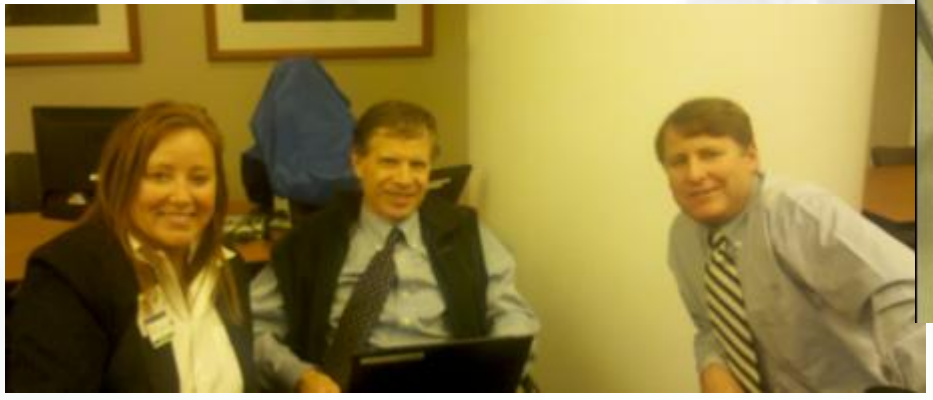
Conclusions:

- Cardiac arrest is common and the third leading cause of death.
- Victims of out of hospital cardiac arrest are unlikely to survive
- Simple interventions in the chain of survival are likely to improve survival
- Data drives change

USE YOUR CARES DATA

TO IT'S FULL POTENTIAL!

Let’s make NC the best place in the country to have a heart attack or a cardiac arrest!



RESOURCES:

RACE CARS

Website

https://cee.dcri.duke.edu/

HeartRescue PROJECT

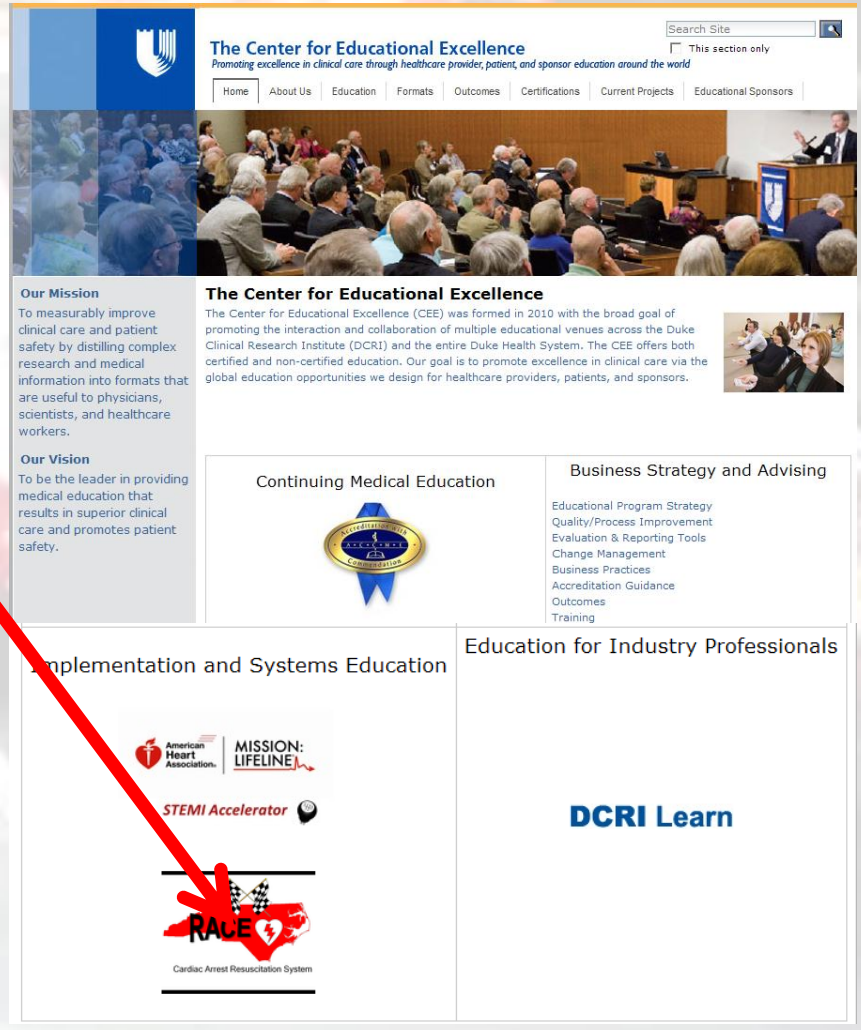
Every Second Counts. Every Action Matters.

RACE

Cardiac Arrest Resuscitation System

Search: https://cee.dcri.duke.edu/

- This is the Home Page
- Scroll down to find the RACE Logo
- Click ***on*** the RACE Logo at the bottom of the page
- This will take you into the RACE Project site

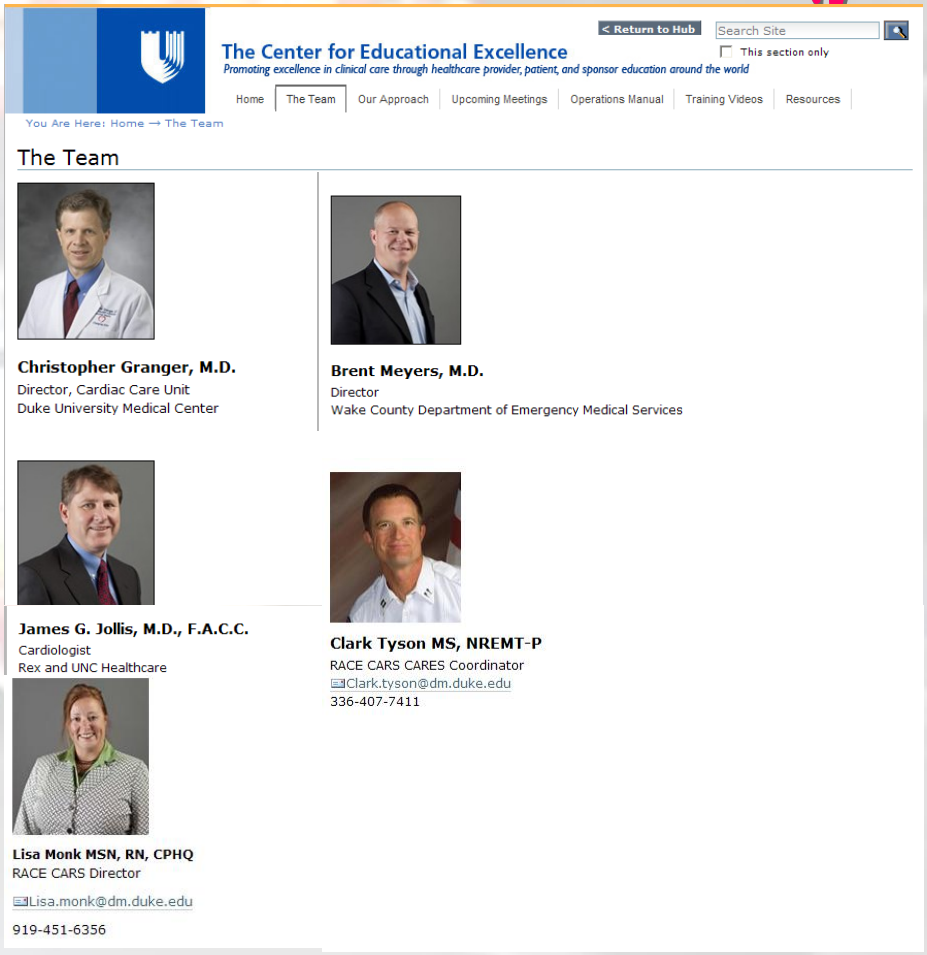


RACE CARS Home Page:

- **RACE Home**
  - provides an overview of the project
- At the top of the screen is a menu:
  - Click on each tab to access the information
- At the bottom of the screen is a:
  - Heart Rescue Public Service Announcement
  - Heart Rescue links for Twitter and Facebook

Click on the Team Tab:

- Provides the names of our NC RACE CARS Administrative Team
- Provides contact information:
  - for the CARES Coordinator and
  - Project Lead

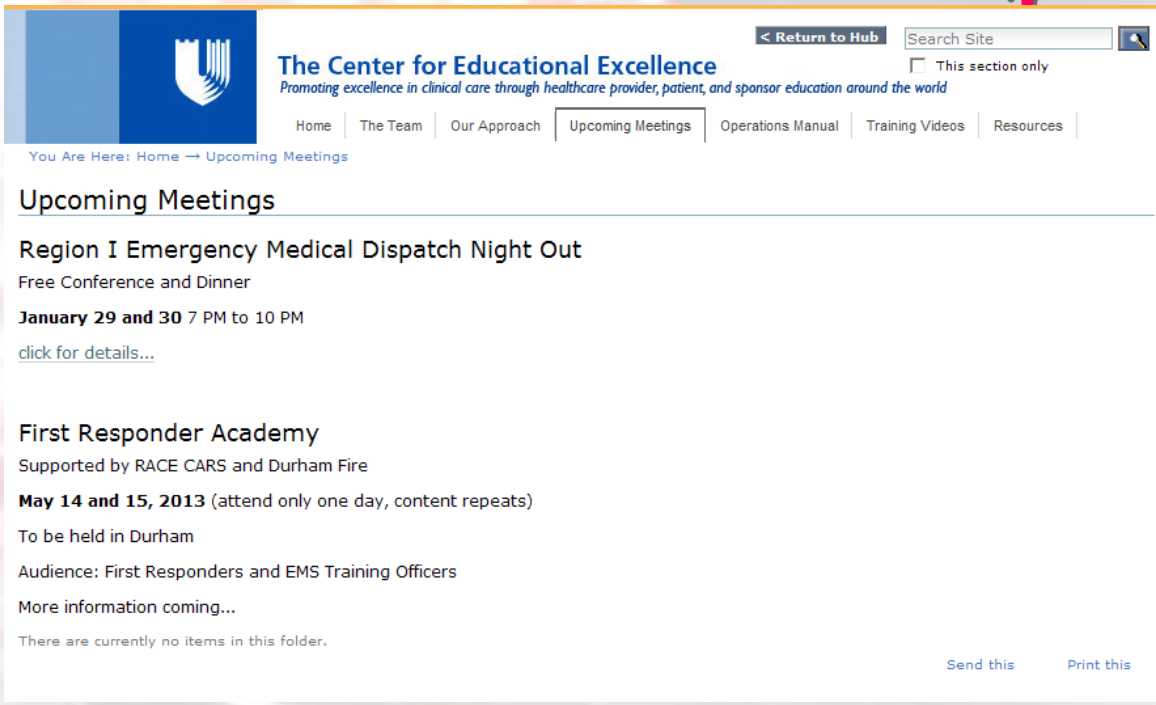


Click the Our Approach Tab:

- Provides our approach to the project including:
  - Community
  - Pre-hospital
  - Hospital

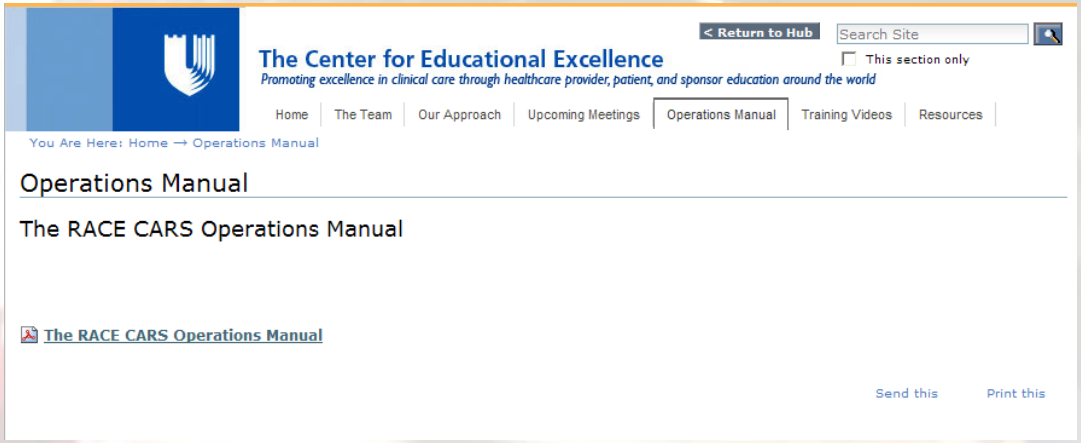
Click the Upcoming Meetings Tab:

- Provides information on upcoming meetings that RACE has planned or is involved with



Click the Operations Manual Tab:

- Provides a PDF of the Operations Manual
- The Manual is divided into sections:
  - Pre-hospital
    - Dispatch
    - First Responders
    - EMS
  - Hospital
  - Community
    - CPR Education and tracking
    - AED funding, placement, and location

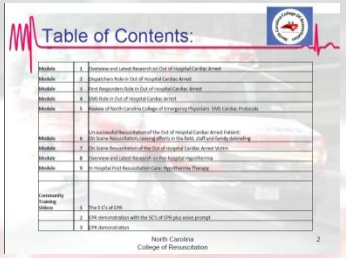


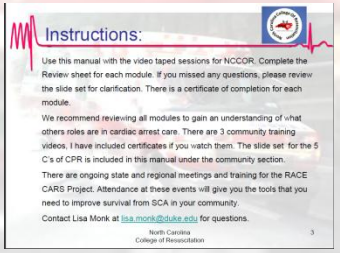
Click the Training Videos Tab:

- Provides:
  - Instruction for using the videos,
  - Videos of topics
  - Copies of the power points used in the videos
  - Q&A to assure understanding of the topic
  - Certificate of completion for each topic
  - NCCOR Thank you is a summary of our work

Under Training Videos: click on the instruction for training videos wording

- Overview of project
- Table of Content
- Instructions for using the videos
- Link to the HeartRescue Website
  - Provides link to other partnering states and all of their resources
  - The HeartRescue Guidebook
  - PSA’s
  - Resource links





Under Training Videos:
Click on the first topic:

- Provides
  - The training video
  - The PowerPoint that is used in the video
  - A Review or Q&A to assure mastering of content
  - Certificate of completion

Must click on the wording to access the files
You can download or print the files
Use the files as you view the videos

Click the Resources Tab:

- Provides Meeting Materials
- Click the Meeting Materials folder:
  - Provides a list of meetings
- Click the meeting folder that you want to view
  - All files from that meeting will be listed
  - Click directly on the words to access the file