



# Critical Topics Saving NC Lives at CarolinaEast Medical Center



Cardiac Arrest Resuscitation System



# ***RACING To SAVE Lives in NC***

**R**egional **A**pproach to **C**ardiovascular **E**mergencies  
*Cardiac Arrest Resuscitation System*

Nick Jarman, EMT-Paramedic



Every Second Counts. Every Action Matters.



Cardiac Arrest Resuscitation System

# RACE CARS

**R**egional  
**A**pproach to  
**C**ardiovascular  
**E**mergencies

**C**ardiac  
**A**rrest  
**R**esuscitation  
**S**ystem



Every Second Counts. Every Action Matters.

# 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

**RACE - ER  
Entire State**

2008

**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



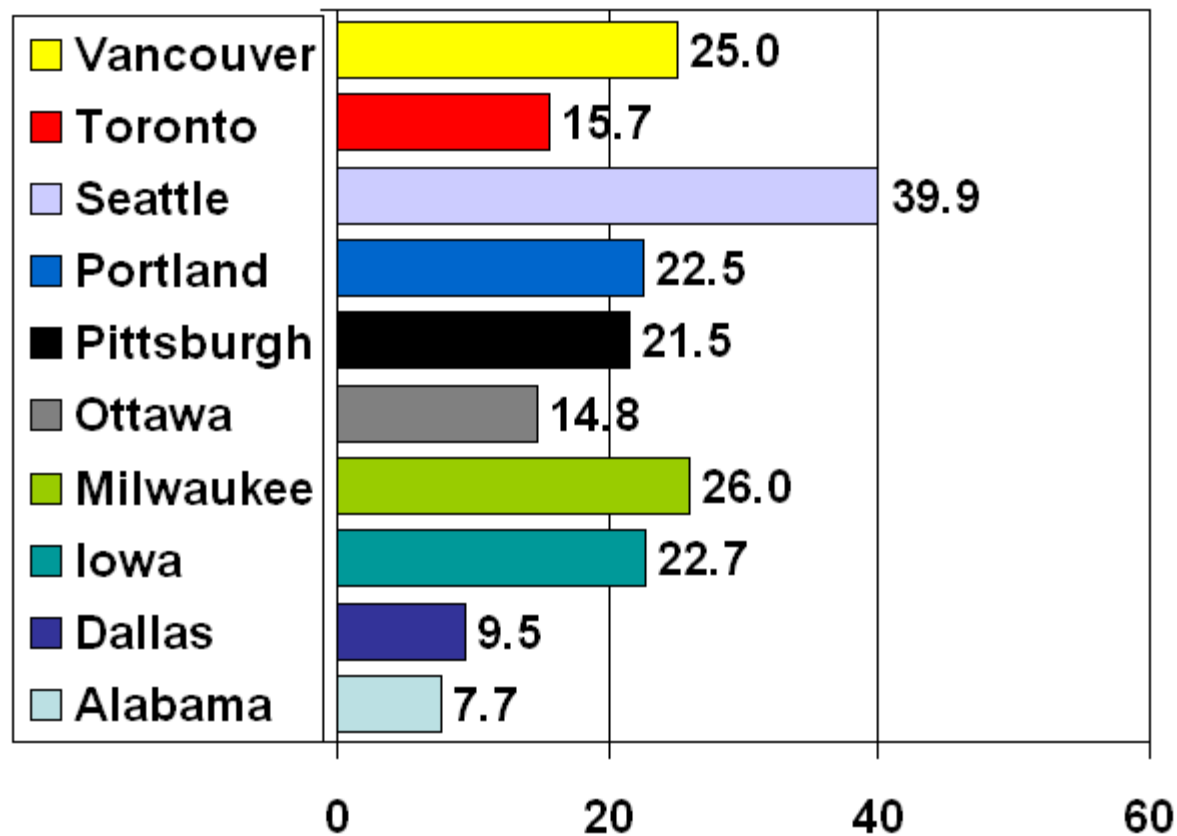
"North Carolina's RACE program cuts door-in door-out times for STEMI patients"

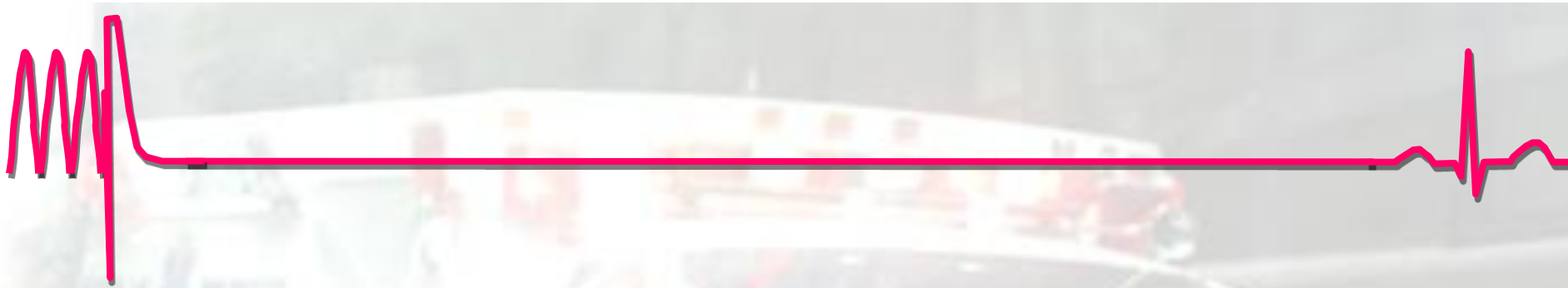
Jun 28, 2011 Reed Miller

# Variation in survival VF arrest

## Resuscitations Outcomes Consortium

### Survival to discharge





*“Where you live should  
not determine  
whether you live”*



If we can't  
save them,

RACE CARS





# HeartRescue Partners







## HeartRescue Partners



### 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

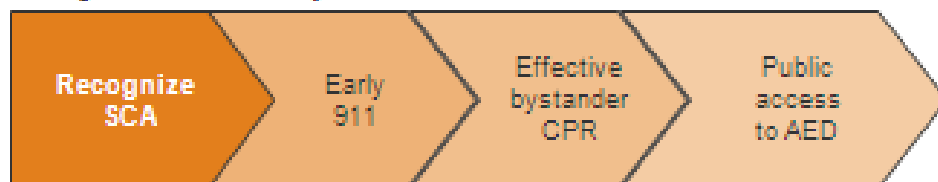
- Expand grant program
- SCA Community Playbook



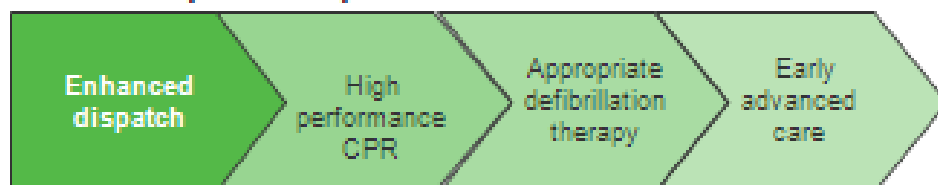
# How to improve:

## Improving SCA Survival

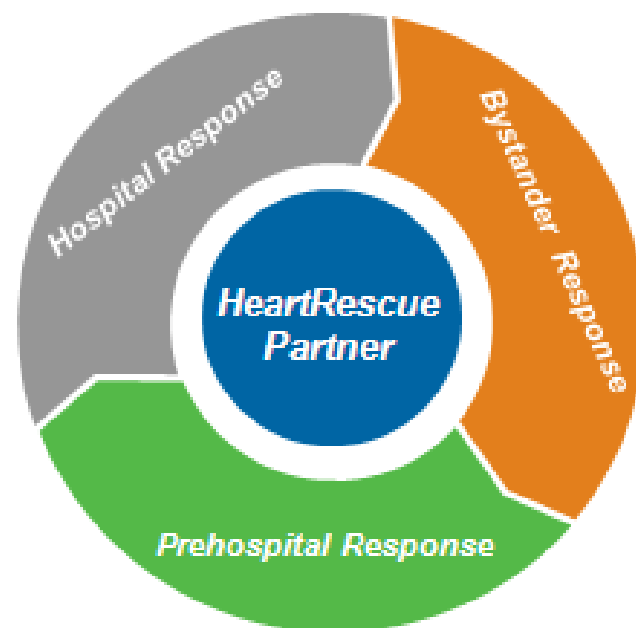
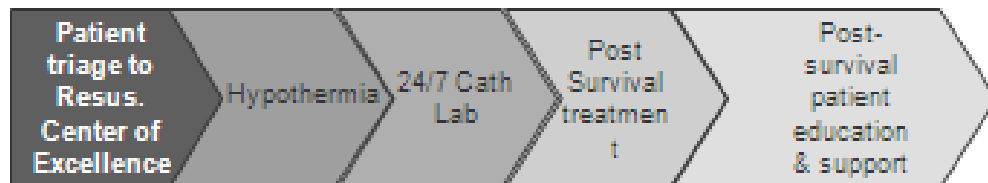
### 1: Bystander Response



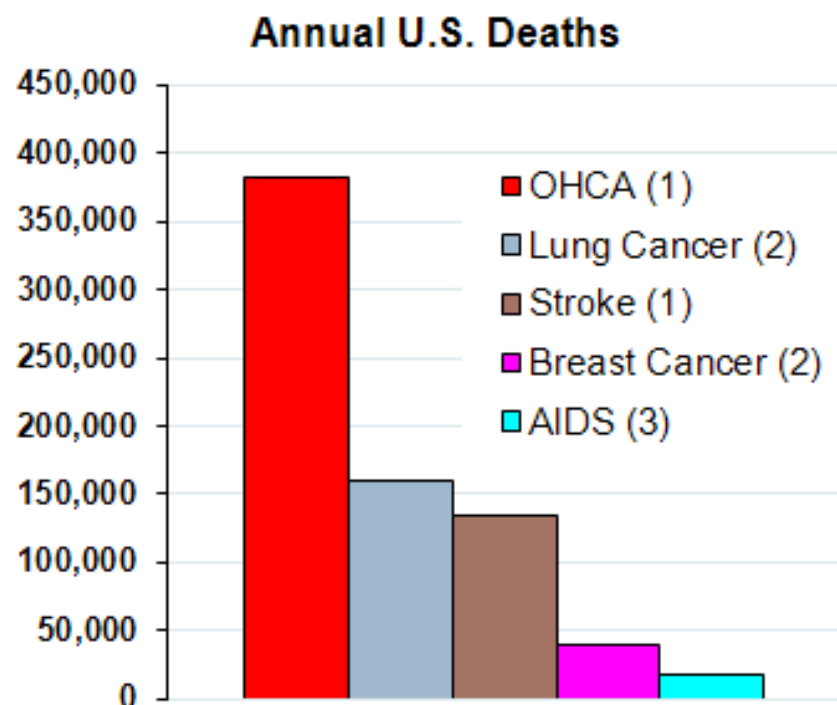
### 2: Prehospital Response



### 3: Hospital Response



## 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.





# 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



# 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



# 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.



# 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 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.



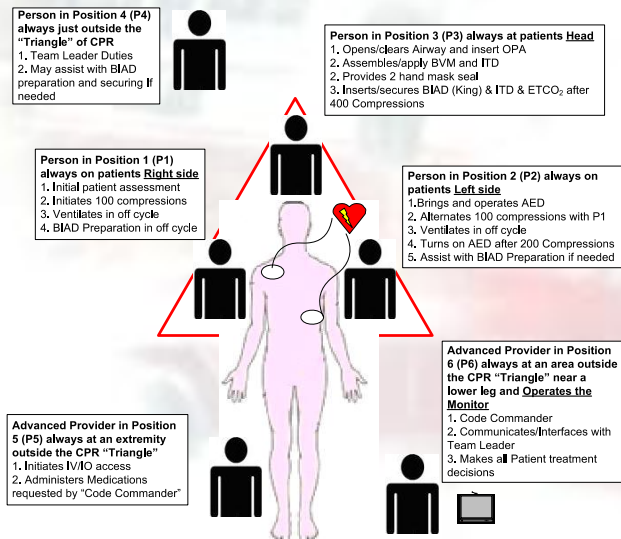
# ***HIGH QUALITY CPR***

## **ACLS: De-emphasis of Devices, Drugs and other Distracters**

- Focus on high-quality CPR and defibrillation
- Atropine no longer recommended for routine use in

# Pit Crew Approach

## CPR Procedure



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

## Pre-assigned Roles

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

Variations to this model exist for:

- 3 Rescuers
- 4 Rescuers
- 5 Rescuers
- 6 Rescuers



SO EASY A DOG CAN DO IT!



## 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



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





