Bringing Chaos Under Control: Team Focused CPR

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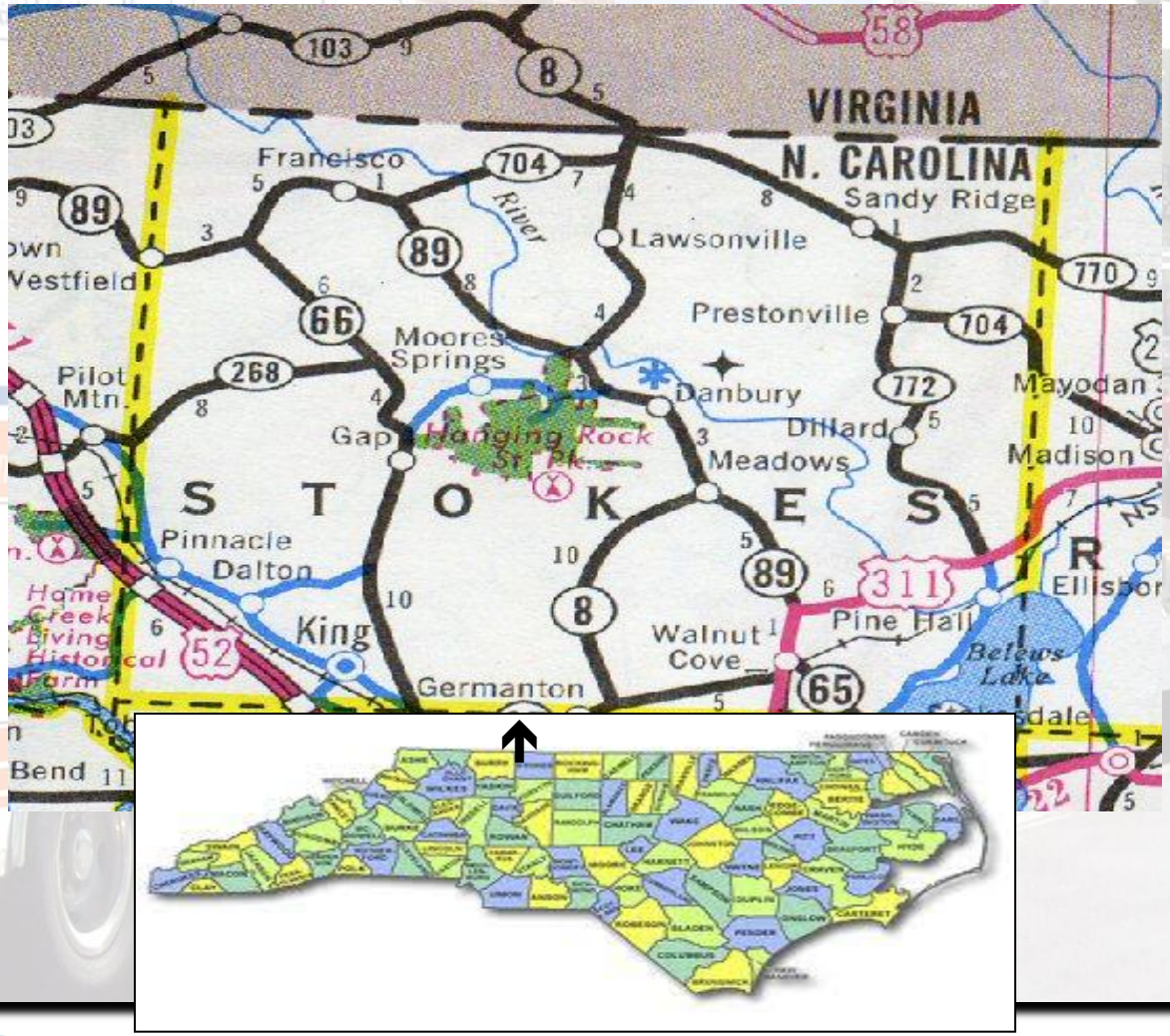
Objectives

- AHA changes from 2010
- Team Focused CPR
- Training of System personnel
- Culture Change for Responders
- Future Direction of Program Initiatives

System Overview



Stokes County EMS

- 5 ALS credentialed Ambulances supported by 3 ALS Quick Response Vehicles.
- 57 FT/PT employees.

- Approximately 9000 call responses per year.
  - 67% ALS responses (Based on 2011 figures)
  - 31% BLS responses (Based on 2011 figures)

City of King Fire Department

Combination Fire Department

- 16 full-time personnel and 20 part-time personnel.
- 2253 calls for the year 2011 (1404 Medical responses and 888 fire responses).
- Credentialed at the EMT-Intermediate level.

Stokes EMS Interpretation of the 2010 AHA Changes

High Quality, uninterrupted Chest Compressions

- CPR where patient is found

BIAD vs. Intubation

- BIAD

Avoiding excessive Hyperventilation

- ITD

Team Focused Approach

- Post-Resuscitation Care
  - Therapeutic Hypothermia

TERMINATION OF RESUSCITATION ON SCENE

Culture Change for Responders

"We get called to transport patient's to the hospital."

"They are taking skills away from me, we are not going to be able to intubate"

We are doing this so that the ER doctor want have to tell the family or deal with the family.

Why do we have to work the call in the house?

We need to get the patient out of their environment and into ours.

Culture Change for Responders

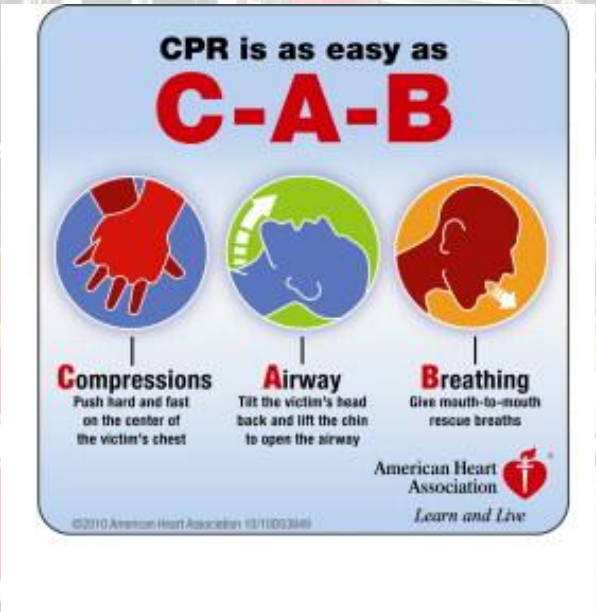
"Why do we keep adding more and more stuff, but my pay does not increase?"

"The hospitals keep wanting more and more information, I don't have time for that."

Getting Back to the Basics!

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 ≥ 94%

Avoid Hyperventilation

- Worsens brain ischemia by inducing cerebral vasoconstriction as PaCO2 falls
- Hyperinflation of the chest
  → increased intra-thoracic pressure
  and
  → impedes venous return to heart, affecting BP

Common Problems Found

Problem	Mitigation
Delay in initiating Chest Compressions	Rapid ABC assessment and initiation of Chest Compressions; one rescuer Chest Compressions while monitor placed
Pauses of Chest Compressions for rhythm analysis and defibrillation	Brief pause for rhythm analysis; continue CPR until ready for shock, clear and then resume Chest Compressions immediately
Pauses of Chest Compressions for advanced airway placement	Defer until later in the arrest unless clinically indicated to do earlier or placement with interruption of Chest Compressions

Team Focused CPR

EMS/Fire is a “Team Sport”.
Improving Cardiac Arrest is a “Team Sport”

EMS & Fire Training

Now, How do we get the science to the patient?

Team Focused CPR

Criteria for Death / No Resuscitation
Review DNR / MOST Form

YES → Do not begin resuscitation

Follow Deceased Subjects Policy

NO

Begin Continuous CPR Compressions
Push Hard (≥ 2 inches) Push Fast (≥ 100 / min)
Change Compressors every 2 minutes
(change in less than 10 seconds)

First Arriving BLS / ALS Responder
Initiate Compressions Only CPR
Initiate Defibrillation Automated
if available
Call for additional resources

Second Arriving BLS / ALS Responder
Assume Compressions or
Initiate Defibrillation Automated / Manual
if available
Place BIAD
DO NOT Interrupt Compressions
Ventilate at 6 to 8 breaths per minute

Utilize this Protocol with
Cardiac Arrest Protocol

AT ANY TIME

Return of Spontaneous Circulation

Go to Post Resuscitation Protocol

Third Arriving Responder
BLS or ALS

BLS

Establish Team Leader
(Hierarchy)
Fire Department or Squad Officer
EMT-B
First Arriving Responder

Rotate with Compressor
To prevent Fatigue and effect high quality compressions
Take direction from Team Leader
Every responder on scene is responsible for performing and ensuring high quality CPR compressions

Fourth / Subsequent Arriving Responders
Take direction from Team Leader

Continue Cardiac Arrest Protocol

ALS

Establish Team Leader
(Hierarchy)
EMS ALS Personnel
Fire Department or Squad Officer
EMT-B
First Arriving Responder

Rotate with Compressor
To prevent Fatigue and effect high quality compressions
Take direction from Team Leader
Every responder on scene is responsible for performing and ensuring high quality CPR compressions

I — Initiate Defibrillation Automated
Establish IV
Administer Appropriate Medications
Establish Airway with BIAD if not in place

P — Initiate Defibrillation Manual
Continuous Cardiac Monitoring
Establish IV / IO
Establish IO After 1 failed IV attempt
Administer Appropriate Medications
Establish Airway with BIAD
if not in place

Continue Cardiac Arrest Protocol

Adult Cardiac Section Protocols

Assignment of on Scene Responsibilities

- Fire Department Assignments (Career, Combination/Volunteer).
- Career arrives as a team.
- Combination/Volunteer builds the team as they arrive

On scene command

- Fire Department

(manager of the scene)

- EMS

(manager of patient Care)

Career Department Model

Structure Fire:

Captain – Crew Leader
Engineer – Supplies Water
Firefighter 1 – Nozzle
Firefighter 2 – Back-up

CPR:

Captain – Team Leader
Engineer – AED
Firefighter 1– CPR
Firefighter 2 – Airway

Combination/Volunteer Department Model

Volunteer builds upon the team as more personnel arrive.

Structure Fire:

1st Firefighter – IC

Truck Driver – Water Supply

2nd Firefighter – Nozzle

3rd Firefighter – Back-up

CPR:

1st Firefighter – CPR (airway)

2nd Firefighter – AED (airway)

3rd Firefighter – Airway (CPR)

4th Firefighter – Team Leader

EMS Crew Model

Crew Member 1:

- Assess cardiac rhythm with **YOUR** cardiac monitor and determine underlying rhythm

Crew Member 2:

- Confirm adequate CPR and Ventilations are being performed
- Initiate IV/EJ/IO
- Medication therapy

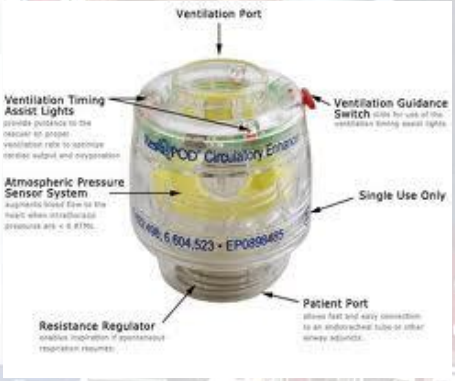
Team/Crew Leader

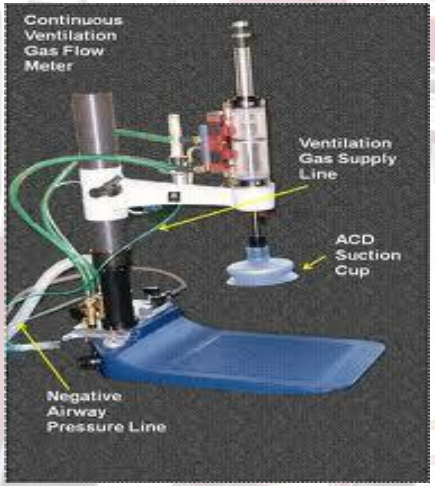
- Designed to be filled by Fire Department
- Primary role is to ensure adequate compressions & ventilations are being performed
- Scene accountability
- Counseling family members and informing them of patient status

Training of EMS/Career Responders

- Scenarios
- Everyone on scene is responsible for the quality of CPR (Not just the Team Leader)
- Role playing
  - Team Leader
  - Airway management
  - Chest Compressions/AED Placement
  - EMS interventions
  - Family Interactions (included in this explanation of discontinuation of efforts)
  - Beginning Care of a new patient

New Equipment





Slate Road CPR

Latest Success Story – 9/9/11

- 47 year old white male

Friday evening at home with family, sudden cardiac arrest.Bystander CPR by wife.

- 9 year old daughter called 911
- First Responders defibrillated with AED,ROSC after 15 minutes
- Arrived at FMC with STEMI, unresponsive, no spontaneous respirations, no pupillary reaction, and no gag reflex

- Cooled fluids administered by Stokes County EMS
- Patient cooled for 24 hours then re-warmed
- Tuesday patient began to have pupillary reactions and spontaneous respirations
- Wednesday – totally awake on vent, recognizing family and friends at bedside
- Thursday – extubated
- Friday – up in chair in CICU
- Tuesday (11 days post arrest) – pt discharged home with short term memory loss

Elements of success:

- Witnessed Arrest
- Recognition, 911
- Medical dispatch
- Bystander CPR
- Continuous, uninterrupted chest compressions
- 1st responder AED
- Appropriately timed ACLS interventions
- Hypothermia protocol


Emergency Medical Services
EMERGENCY
911
KING
30
FIRE DEPT

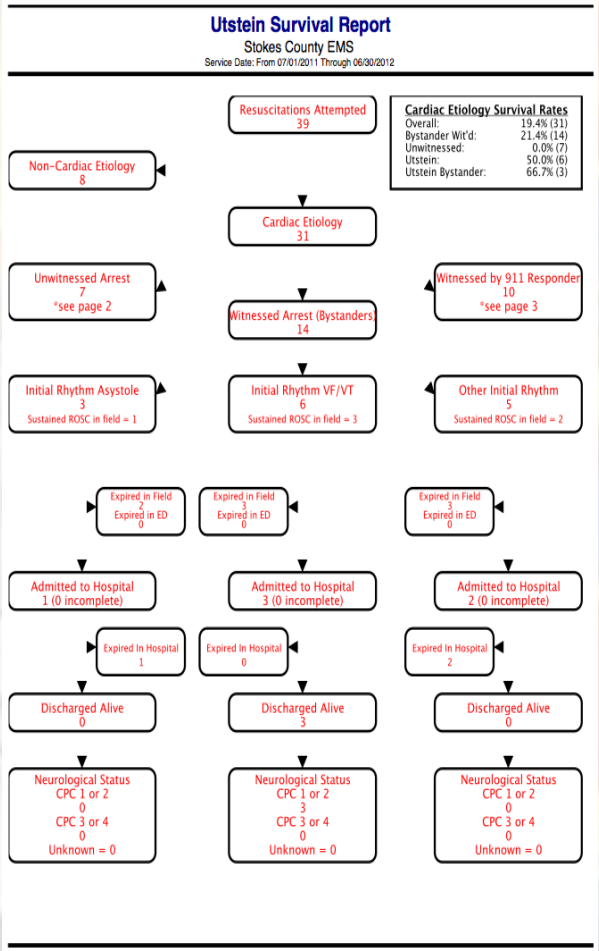
Summary

Future Direction

- Aggressive Public CPR Education
- 911 Dispatched Assisted CPR
  - Recognition of CPR and beginning instructions within 60 seconds.
  - Simulcast of known cardiac arrest responses with Law Enforcement assistance in early CPR.
- AED's for First Responders vehicles.
- Increase CPR training for agencies in local government agencies.
- Code review with crews and facilities involved.

Stokes County EMS System Data

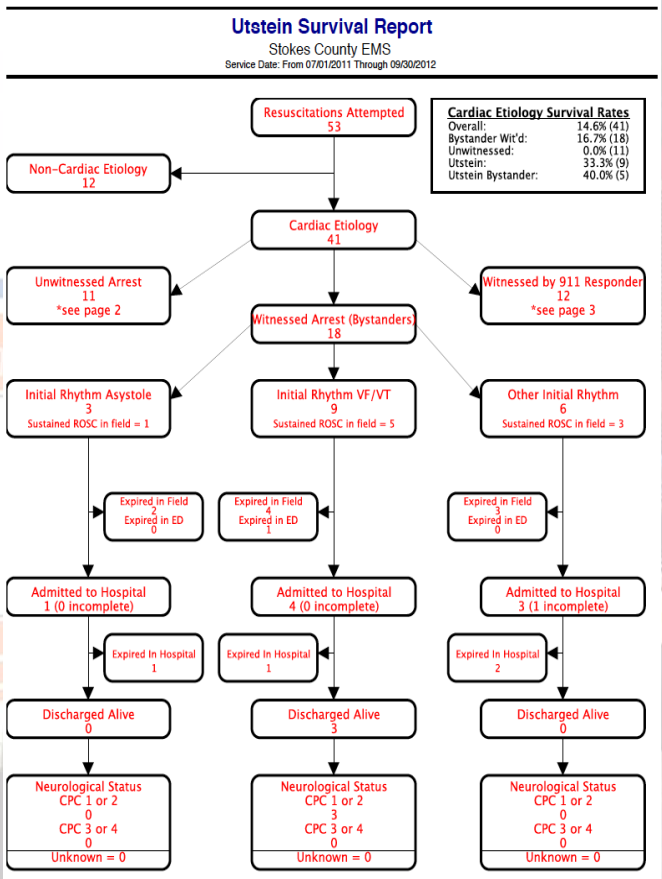
July 2011 – June 2012



Cardiac Etiology Survival Rates

Overall:	19.4% (31)
Bystander Wit'd:	21.4% (14)
Unwitnessed:	0.0% (7)
Utstein:	50.0% (6)
Utstein Bystander:	66.7% (3)

Stokes County EMS System Data
July 2011 – September 2012



Cardiac Etiology Survival Rates

Overall:	14.6% (41)
Bystander Wit'd:	16.7% (18)
Unwitnessed:	0.0% (11)
Utstein:	33.3% (9)
Utstein Bystander:	40.0% (5)

Four Important Factors

Pick 1 -2 improvements to work on.

Training with real-time quality feedback

Utilize Peer Review Process for evaluation.

Celebrate the gains/successes.

Look for the unique opportunities in your community for improvement or programs.

Bottom Line Improvement

- 2010
  - Utstein Survival 5.7 %
  - CARES Data
- 2011 – 12/31/2102
  - Utstein Survival 35.7 %
  - CARES Data

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

Special Thanks to:

City of King Fire Department
Stokes County EMS
Stokes County Fire and Rescue Association
Stokes County 911 Communications
Wake Forest Baptist Health
Forsyth Medical Center
Pioneer Community Hospital of Stokes

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