STEMI news

WINTER 2013

Cardiovascular Symposium Takes Center Stage, New RACE Manual Gives Recommendations
By Abby Smith, MS, and Claire Corbett, MMS, NREMT-P

Welcome to New Hanover Regional Medical Center’s winter 2012/2013 edition of STEMI News. This newsletter provides valuable information on the current STEMI system of care at NHRMC and any new updates to STEMI patient care across the region.

In September 2012, NHRMC hosted its first combined Cardiovascular Symposium. The symposium provided practitioners with lectures and seminars on the most advanced, evidence-based medicine for the treatment of STEMI, stroke, cardiac arrest and cardiovascular disease. With more than 250 attendees and 28 sponsoring vendors, the event was an amazing success. Thank you to all emergency and cardiac care personnel in the region who attended.

Part of the symposium included a welcome reception and awards presentation where NHRMC received the American Heart Association’s Mission: Lifeline Silver Quality Achievement Award for heart attack care in 2012. Hospitals and EMS agencies in the region were recognized.

Silver Award recipients are recognized for at least 12 months of 85 percent or higher adherence on all ACTION Registry – GWTG achievement measures, including the most challenging criteria of first medical contact to balloon time of less than 90 minutes. This measure could not have been obtained without the hard work of our EMS, emergency departments and cardiologists.

In the future, this award will include transfer times from referral hospitals as a specific measure. Referral hospitals are eligible to receive their own award by participating in the ACTION Registry®-GWTG, the approved Mission: Lifeline national registry program. Three of 10 total bronze awards given to referral centers in the country in 2012 were to North Carolina hospitals.

Please mark your calendar for this year’s NHRMC Cardiovascular Symposium, September 26-27.

On June 5, 2012, the RACE manuscript Expansion of a Regional ST-Elevation Myocardial Infarction System to an Entire State was released in the American Heart Association’s journal Circulation. The data-driven manuscript showed that having a uniform and comprehensive approach to organizing STEMI systems across North Carolina resulted in marked improvements in time to reperfusion in STEMI patients. This provides evidence in support of implementing STEMI systems on a national basis.

The new updated RACE Operations Manual was released this fall as a template for STEMI regions to draw from and use to formulate or improve their STEMI patient care plans. The manual includes evidence-based diagnostic and treatment recommendations for providers across the continuum.

The most recent phase of RACE, RACE-CARS (Regional Approach to Cardiovascular Emergencies – Cardiac Arrest Regional System), is focused on improving outcomes of out-of-hospital cardiac arrest patients. It is modeled after the successful regional STEMI program. The Medtronic Foundation selected North Carolina as one of five states to implement a regional cardiac arrest system as a part of the HeartRescue Project. This project focuses on improving survival from out-of-hospital cardiac arrest by improving bystander response, pre-hospital response and hospital care. The same partners involved in the STEMI program are included in RACE-CARS, including EMS and hospitals, with the addition of a community education plan. A primary goal of RACE-CARS is to increase the survival rate from out-of-hospital cardiac arrest by 50 percent over five years. Included in this newsletter is an article on the pit crew method of resuscitation, which focuses on organized team-based management to cardiac arrest.

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Symptom Based Rule for Rapid EKGs
By Claire Corbett, MMS, NREMT-P, Hamilton J. Wells, MD, and Terri DeWees, RN, MSN, CEN, NE-BC

One of the most critical steps in the timely treatment of STEMI patients is early diagnosis. The American College of Cardiology/American Heart Association Guidelines state that a 12-lead EKG should be performed within 10 minutes of ED arrival for patients with chest discomfort (or angina equivalent) or other symptoms suggestive of STEMI. This recommendation has been largely accomplished, however, challenges still occur in STEMI patients who present with symptoms other than chest pain. Delays in obtaining a rapid EKG can lead to delays in reperfusion treatment of STEMI patients.

How do we create a standardized approach to determine which patients, without chest pain, should receive rapid EKG in triage or in the ambulance? A study by Dr. Louis Graff and colleagues published in 2000 developed a recommendation for obtaining a rapid EKG. They developed a rule based on presenting chief complaints to identify patients for rapid (5-minute) EKG and to decrease delays in treatment associated with delays in early diagnosis.

In the study, 22,717 emergency department visits from July to December 1994 were evaluated. Of these visits, 193 patients were discharged with diagnosis of acute myocardial infarction. Study investigators found that 67 percent of the 193 patients, presented with initial complaint of chest pain. Twenty-two other complaints were voiced at triage, most commonly rapid heartbeat, weakness, syncope and shortness of breath. All patients were age 30 or older.

Based on this data, study investigators developed the following rule for rapid EKG in triage: Patients older than 30 with chest pain or patients older than 50 with rapid heart rate, weakness, syncope or shortness of breath. For the next five months, study investigators validated the rule and examined the impact on treatment times. They found that by implementing the rule, door-to-EKG times decreased from 10 to 6.3 minutes and door to thrombolytic therapy decreased from 37 to 26 minutes.

This challenge of identifying patients who should have rapid EKG was also described in the March 2012 issue of the American Heart Journal. Glickman et al looked at 6,464 patients with discharge diagnosis of STEMI in 2007 and 2008. They set out to describe presenting symptoms of patients by age and gender to develop a tool to identify a subset of patients without chest pain that should receive an early EKG. In this study, 22 percent of the 6,464 patients with STEMI did not have chest pain. Of these 22 percent, women were more likely to not have chest pain. Additionally, as age increased, the likelihood of chest pain decreased.

From this analysis, a simplified rule was developed for practical application purposes in emergency departments to help identify patients and obtain rapid EKGs. The simplified recommendation states that patients with the following should receive a rapid EKG at triage: Any patient with chest pain > 30 years old, patients > 50 years old with dyspnea, altered mental status, upper extremity pain, syncope or weakness, and patients > 80 years old with abdominal pain or nausea/vomiting.

Many hospitals have “obtain an EKG” listed under triage protocols for chest pain or shortness of breath; however, most do not have a stand alone protocol for who should receive an EKG. Implementation of a protocol for patients who should receive a rapid EKG upon presentation may decrease door-to-EKG times, as well as door-to-reperfusion therapy, especially for patients who present with symptoms other than chest pain. The emergency departments at NHRMC and NHRMC Orthopedic Hospital are implementing such a protocol based on the two previous studies to empower providers at triage to obtain an EKG on any patient meeting the criteria.

Representation of the final triage EKG decision rule for STEMI

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Pit Crew Method to Resuscitation

By David Glendenning, EMT-P, Education Coordinator
New Hanover Regional Medical Center EMS

Imagine a race car sliding into a pit stop. The car appears instantly swallowed by a ring of people, only to re-emerge seconds later out of that ring to continue racing. In these few seconds, the tires have been changed, the gas tank filled and some mechanical parts replaced.

What does racing have to do with cardiac arrest, you ask? The American Heart Association (AHA) strongly emphasizes a team-based approach to resuscitation management. One method in widespread use by emergency response teams is the pit crew method, so named because of its similarity to how pit crews work quickly and effectively in auto racing.

Each member of the pit crew is trained in a specific role and educated on the roles of the rest of the team. In resuscitation management, this same methodology has been adopted.

Pit Crew Methodology Includes:
- increasing leadership
- improving communication to minimize errors
- performing many interventions simultaneously
- minimizing compression interruptions
- controlling ventilations
- providing defibrillation at appropriate intervals

With this method, each person has pre-assigned roles, with a focus on performing their role efficiently. The team understands that the process is centered on high quality CPR, which results in the SCA victim having a much better chance of survival. Please refer to the 6 Person Resuscitation chart on page 4 for a more detailed description.

High quality CPR Defined

High quality CPR means minimizing interruptions in compressions at all times, ensuring proper depth, ensuring proper recoil, ensuring proper rate (100-120), placing hands over chest during defibrillation for immediate return of compressions, intubation or advanced airway with ongoing CPR, and IV/IO access with ongoing compressions.1

Data and Argument for Organized Systems of Care and Team-Based Resuscitation

In 2008, the Resuscitations Outcomes Consortium completed a study investigating the variation in survival from VF arrest across 10 different geographic locations. The study found that there were significant regional differences in outcomes from out-of-hospital cardiac arrest (OOHCA), with survival at discharge varying from 7.7 percent to 39.9 percent.2 This study highlights the need for organized systems of care for management of OOHCA. In 2010, the American Heart Association updated its guidelines, focusing on “high quality CPR.” For patients to have the best chance of survival, they need early, continuous compressions and early defibrillation, the guidelines emphasized.3 The historical “ABCs” (airway, breathing, circulation) approach to CPR was changed to “CAB” (compressions, airway, breathing).

Chest compression fraction, which is time spent actively pressing on the chest, has been shown to be an independent predictor of better survival.4 Cheskes and colleagues studied the impact of pre- and post-shock pauses and found that longer pauses in compressions before and after defibrillation were independently associated with a decrease in survival. They recommended that the optimal pre-shock pause should be less than five seconds.

Implementing the Pit Crew Method of Resuscitation

The pit crew method of resuscitation can be implemented in a variety of ways and customized to resources available during resuscitation. For example, models can be implemented for three, four, five or six responders. Although primarily implemented in the pre-hospital environment, this model is also now being utilized in emergency rooms.

For more information on how to implement pit crew method or to request training, please contact Claire Corbett, NHRMC AMI and Stroke programs manager, at claire.corbett@nhrmc.org or David Glendenning, EMT-P, Education Coordinator with NHRMC EMS, at david.glendenning@nhrmc.org.

1 Seattle Resuscitation Academy “High Performance CPR Toolkit” March 2011
2 Nichol, G “Regional Variation in Out-of-Hospital Cardiac Arrest Incidence and Outcome” JAMA.2008;300(12):1423-1431
3 Travers, A “2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science” Circulation. 2010;122(18)
Onslow Memorial Hospital
Nancy Pate, RN
Assistant Nurse Manager, Emergency Department
Katie Wilfawn, RN
Patient Care Coordinator, Emergency Department

1. Who is part of your STEMI team and what key components and/or players make your team successful?

Our STEMI team consists of emergency room nurses and physicians. Key players in our care are front line staff members who are involved with STEMI process improvement, as well as medical staff who have the knowledge of STEMI guidelines. Ancillary services such as radiology and respiratory care are involved as needed with patient care. Additionally, we utilize PCI facilities for appropriate patient disposition decisions and transfer.

2. How do you identify and perform EKGs on patients who present as potential STEMI patients within the 10-minute goal?

To identify potential STEMI patients, we have a process in which our pivot nurse (an RN who sits at the front desk of the emergency department) filters chief complaints and determines which patients need an EKG. The nurse orders an EKG. The “EKG tech” ensures the 10-minute benchmark is achieved. Our current average door-to-EKG time is 10.6 minutes.

3. Do you have a fibrinolytic agent stored and available at all times? How is it readily available?

We have access to a fibrinolytic agent 24 hours a day through the pyxis in our Emergency Department. We have created an “AMI box” which is readily available and includes TNKase, Aspirin, Nitroglycerin, Pepcid, Heparin, and Metoprolol. We have two kits ready in our department at all times. Pharmacy monitors and replaces these kits as needed.

4. What do you see as potential barriers to care for STEMI patients in your region? How have you addressed or overcome these barriers?

I believe a primary potential barrier to our STEMI patient care is geographic location. Onslow Memorial Hospital along with Onslow County EMS work together to overcome the challenge of distance through an ongoing process improvement initiative. The EMS system has implemented and nearly perfected the RACE protocols for our patients across the area. At OMH, we are continually assessing data to improve our door-to-transfer times. This includes expediting patient care with early diagnosis and hotline activation, along with the evaluation of transport times. This barrier has been reduced greatly due to the great teamwork of our facility and the PCI centers that receive our patients.