Welcome to New Hanover Regional Medical Center’s STEMI News. In this issue you will find information about therapeutic hypothermia, indications for the use of Ticagrelor in STEMI patients and the new STEMI education video scheduled for release this fall. This issue’s regional spotlight features Pender EMS and their work with STEMI patient care.

NHRMC Receives Mission: Lifeline Gold Award

This year, NHRMC received the 2013 Mission: Lifeline Gold Award for STEMI care, the highest honor awarded to STEMI care facilities. In 2012, only 25 hospitals in the U.S. received the Mission: Lifeline Gold Award. A facility must have 85 percent or greater composite scores with no single measure below 75 percent for two years in a row. This success is directly attributed to the daily efforts of all the region’s EMS providers, nurses, physicians and staff that care for STEMI patients. Thank you to all STEMI care providers for your commitment and hard work. The Southeastern STEMI Region will be recognized at the Cardiovascular Symposium Welcome Reception on September 26.

NHRMC’s Cardiovascular Symposium 2013

This year’s Cardiovascular Symposium, September 26-27, will be held at the Wilmington Convention Center featuring keynote speaker Jack Lewin, former CEO of the American College of Cardiology, presenting on the effects of healthcare reform on cardiology. The Symposium will also include an EKG education series presented Tim Phalen. The symposium will also have scientific poster presentations, and offer radiology and echocardiography, and ACPE pharmacy credits for registered attendees. A pre-conference acute stroke life support workshop will also be offered that morning.

Marlene Sigler Scholarship

Also this year, the 2013 Marlene Sigler Scholarship will be awarded. The $1,000 scholarship, in memory of NHRMC employee Marlene Sigler who passed away last year, recognizes an individual in cardiac health care who engages in continuing education and exhibits a commitment to the expert delivery of cardiovascular care.

To register for the Symposium or for more information on the Marlene Sigler Scholarship, visit www.nhrmc.org/cvsymposium.

NHRMC Heart Center: Excellence Happens Here

The NHRMC Heart Center is among the state’s leaders in cardiac care. The NHRMC Heart Center houses a 16-bed Coronary Care Unit, a 14-bed Cardiovascular Intensive Care Unit and two technically advanced open-heart surgery suites. The Center also offers comprehensive cardiac catheterization, electrophysiology and cardiovascular labs. The NHRMC Heart Center performs more than 550 surgical procedures and 12,000 diagnostic procedures each year.
Ticagrelor in STEMI Patients: A Protocol Change for Zone One Hospitals
Mary Beth Bobek, Pharm.D., CPP, and Christopher Barber, MD

Background
A recent new change to the Zone One hospital STEMI protocol has been the addition of Ticagrelor (Brilinta) instead of Clopidogrel (Plavix).
Ticagrelor (Brilinta) is similar to Clopidogrel (Plavix) in its mechanism of inhibiting platelet aggregation. Both agents bind to the adenosine diphosphate (ADP) receptor on platelets and prevent activation of GP IIb/IIIa complex, which is necessary for platelet aggregation. Ticagrelor outperformed Clopidogrel in both STEMI and UA/NSTEMI patients for a reduction in cardiovascular death, myocardial infarction and stroke\footnote{Cannon C, Harrington R, James S, Ardissino D, Becker R, Emanuelsson H, Husted S, Katus H, Keltai M, Khurmi N, Kontny F, Lewis B, Steg PG, Storey R, Wijaya D, Wallentin L. Comparison of ticagrelor with clopidogrel in patients with a planned invasive strategy for acute coronary syndromes (PLATO): a randomized double-blind study. Lancet. 2010 Jan 23;375:283-93.}. It is the only agent to show a reduction in mortality over Clopidogrel in these patients.

Practice Guidelines

European STEMI Recommendations:
\footnote{1B: Ticagrelor plus aspirin, or prasugrel plus aspirin, are recommended in patients treated with PCI.\footnote{1C: Clopidogrel plus aspirin is recommended when Prasugrel or Ticagrelor are either not available or contraindicated.\footnote{STEMI Protocol Changes Zone One hospitals: Ticagrelor is now on the STEMI protocol for Zone One hospitals only for those patients being transferred for primary PCI. (Including Cape Fear and Pender Memorial Hospital).\footnote{Zone Two hospitals: Clopidogrel remains the drug of choice with fibrinolytics at Zone Two hospitals because Ticagrelor has not been well studied in patients receiving fibrinolytics. Zone Two hospitals are not designated to be primary PCI hospitals.\footnote{Note: Zone One hospital treatment strategy is to transfer patients directly to the catheterization lab for primary PCI because of the ability to meet 90-minute benchmark. Zone Two hospitals use a combination fibrinolytic and transfer strategy due to greater geographic distance from the catheterization lab that prohibits meeting the 90-minute benchmark.}}}}}

STEMI Protocol Changes

Zone One hospitals: Ticagrelor is now on the STEMI protocol for Zone One hospitals only for those patients being transferred for primary PCI. (Including Cape Fear and Pender Memorial Hospital).

Zone Two hospitals: Clopidogrel remains the drug of choice with fibrinolytics at Zone Two hospitals because Ticagrelor has not been well studied in patients receiving fibrinolytics. Zone Two hospitals practice will not change.

Medication Information

\begin{itemize}
\item **Dosing:**
  \begin{enumerate}
  \item Ticagrelor Loading Dose: 180 mg (90mg tablets x 2) po x 1 with aspirin 325mg po x 1
  \item Maintenance dose: 90 mg po bid with low dose aspirin 81mg po daily
  \end{enumerate}

\item **Side Effects:**
  \begin{enumerate}
  \item Bleeding (7.8%)
  \item Dyspnea (13.8%): can be seen with first dose
  \item Transient bradycardia
  \end{enumerate}

\item **Contraindications (similar to clopidogrel):**
  \begin{enumerate}
  \item History of intracranial hemorrhage
  \item Active pathological bleeding
  \item Severe hepatic impairment
  \end{enumerate}

\end{itemize}

Important Prescribing Points to Remember with Ticagrelor:

\begin{itemize}
\item Daily doses of aspirin should not exceed 100mg
\item There are some drug interactions. Daily doses of simvastatin and lovastatin should not exceed 40mg.
\item There was a higher risk of non-CABG related bleeding with Ticagrelor
\end{itemize}

References:
\begin{enumerate}
\end{enumerate}
Hypothermia Basics and the Code Cool Protocol
By Elliot D. Backer, M.D., Mary Beth Bobek, Pharm.D., CPP, Douglas Lee, MD

Nearly 400,000 cases of cardiac arrest occur annually in the U.S. in the outpatient setting. Management of these emergencies continues to change with the advent and improvement of treatment strategies. Although Hippocrates first hypothesized about the medicinal effects of cold, it was not until the 1980s that the neuroprotective benefits of hypothermia were first published. Death following Return of Spontaneous Circulation (ROSC) in post-cardiac arrest patients is usually a result of reperfusion injury. Destructive processes following reperfusion after ROSC can be prevented or significantly mitigated by hypothermia. Therapeutic hypothermia is now the standard of care and continues to be integrated at New Hanover Regional Medical Center, surrounding EMS agencies and hospitals. NHRMC’s Code Cool protocol aims to reduce mortality and improve neurologic outcomes following ROSC in post-cardiac arrest patients.

As mentioned in the last issue of this publication, NHRMC’s pit crew method of resuscitation, which begins with rapid EMS response, remains the primary and guiding methodology in facilitating successful resuscitation, ensuring cardiac arrest patients arrive at the Emergency Department alive. When ROSC has been achieved for at least 15 minutes in the setting of a ventricular fibrillation (VF), pulseless ventricular tachycardia (VT), witnessed Pulseless Electrical Activity (PEA), or witnessed Asystolic arrest, Code Cool may be initiated. In the field, cold intravenous saline or ice packs begin the induction phase of hypothermia, which is continued at NHRMC with the Arctic Sun® water-circulating cooling blanket.

The Code Cool multidisciplinary committee has developed NHRMC’s therapeutic hypothermia protocol with input from Emergency Room physicians, intensivists and cardiologists. The cooling process continues to a goal core-temperature of 33°C (90.8°F). The human body responds naturally to cold by shivering to warm the body, which in turn interferes with the hypothermic process. To address this physiologic response, which may compromise a favorable outcome, NHRMC is implementing a new anti-shivering protocol which utilizes agents ranging from acetaminophen to neuromuscular blockers. Once at target temperature, the patient enters the maintenance phase of treatment. The therapeutic hypothermia protocol continues for 24 hours, in conjunction with frequent neurologic, hemodynamic and metabolic testing. After treatment completion, rewarming of the patient occurs in a slow and controlled process.

As the international medical community proceeds with ongoing studies in this field, NHRMC will continue to enhance its abilities and evidence-based practices to care for these patients. NHRMC extends a special thanks to the Code Cool team and referral EMS agencies and hospitals, which work diligently every day to save lives and improve quality of life.

References:

Emergency Department Code Cool Process

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<tr>
<th>Inclusion Criteria:*</th>
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<tbody>
<tr>
<td>• Cardiac arrest with continuous ROSC for 15 minutes.</td>
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<tr>
<td>Exclusion Criteria:*</td>
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<tr>
<td>• Unwitnessed PEA/Asystole arrest</td>
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<td>• Patient follows commands or has purposeful movements</td>
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<tr>
<td>• Arrest due to trauma, hemorrhage, or sepsis</td>
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<tr>
<td>• &gt; 8 hrs since ROSC</td>
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<tr>
<td>• Advanced care not warranted (e.g. DNR/DNI, pre-event terminal condition)</td>
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<tr>
<td>• Another reason to be comatose (comatose at baseline, stroke, status epilepticus prior to arrest)</td>
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<tr>
<td>• Refractory shock (SBP &lt; 90 mmHg, despite use of vasopressors)</td>
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<tr>
<td>• Temp &lt; 34° C</td>
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<tr>
<td>• Pregnancy (consult OB prior to cooling)</td>
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<tr>
<td>• Known coagulopathy or bleeding disorder</td>
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Code Cool Activation:  
• CCL (RN respond to ED for assistance)  
• Intensivist on-call  
• Respiratory Therapy  
• Pharmacy  
• C2R2 (respond to CCU)  
• Program leadership

Initial Rhythm VF or VT or signs of ischemia, chest pain prior to event?

- Yes
- No

Activate “Code Cool”**

Pt meets above criteria for TH

Begin (or continue) TH Induction 30cc/Kg Cool NS & Initiate Arctic Sun

EKG meets STEMI criteria?

- Yes
- No

Activate “Code Cool”**

STAT Cardiology consult, possible cardiac cath**

*The inclusion/exclusion criteria are provided as a guide and clinical discretion supersedes any of these criteria if the benefit outweighs the risk.  
** Initiate induction of hypothermia prior to cardiac cath. Keep groin area clear of cooling device or ice packs.
SE RACE Region STEMI Education Video
Kevin Hodge, RN, CFRN, CMTE, EMT and Claire Corbett, MMS, NREMT-P

The Southeastern STEMI Region is a large region, and achievement of timely reperfusion is only accomplished by following the well-established multi-step STEMI plan. Several factors that affect the longevity of this system’s success are dependent on reaching all providers with consistent training and standard practices across the continuum. This can be challenging and complicated, especially with provider turnover, competing educational needs, as well as the fact that STEMI patients are high-acuity, low-volume cases.

With these factors in mind, it was determined that offering the Southeastern STEMI Region a standardized educational tool on the STEMI process might assist in overcoming some of these challenges. What has resulted is a standardized training video outlining STEMI process and protocol specific to our STEMI region.

The video was produced by a team of regional STEMI providers and includes the Southeast Region CODE STEMI and RACE STEMI processes based on recommendations established by the American College of Cardiology and Heart Mission: Lifeline program. System goals and best practices are highlighted in an effort to hardwire the must-haves to provide consistent optimal patient care in recommended reperfusion times. The STEMI education video offers a look at each segment of care provided to STEMI patients, from first medical contact to primary reperfusion strategy. The video provides the opportunity to not only understand individual roles and responsibilities but also to understand the entire STEMI system of care. The video will be distributed this fall to all regional partners.

Pender EMS
Stacey W. Wright, AAS, EMT-P
Safety Officer / Training Officer, Pender EMS

1. What key feedback, training methods or strategies do you believe are most important and have made Pender EMS successful at STEMI patient care?

The key is utilizing the STEMI feedback process for loop closure once the Code STEMI process is complete. I share this feedback with all parties involved in the call – from the 911 operators, first responders and EMS crew to the shift supervisors, administration and our medical director. Everyone involved with the call gets to see the outcome and the difference it can make. Attending quarterly meetings also helps in disseminating important information to the staff.

2. What training have you initiated with Pender EMS to prevent high false activation rates?

We have done more 12-lead competencies using STEMI feedback as a learning tool. For false activation training, I review the call and 12-leads with individual crews to get a better understanding of why they activated Code STEMI. This leads to better and more comprehensive education.

3. What steps have you taken to decrease scene times? What steps have been the most effective?

Reminding staff of time expectations and showing how decreased treatment time correlates directly to decreased mortality has the most positive impact.

4. What training have you implemented to facilitate STEMI transfers?

Communicating to the staff what is expected and why it is important is the key to following the handoff plan that is laid out. Giving constant feedback on what needs to happen, and keeping staff informed of any changes, and the reasons behind those changes, keeps the process a constant priority.

HEART SAVERS

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>D2B:</th>
<th>E2B:</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 14, 2013</td>
<td>Pender Memorial Hospital</td>
<td>85 minutes</td>
<td>Transported</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>by Airlink 1</td>
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<tr>
<td>May 29, 2013</td>
<td>Duplin EMS</td>
<td>72 minutes</td>
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<tr>
<td>July 1, 2013</td>
<td>New Hanover Regional EMS</td>
<td>44 minutes</td>
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<tr>
<td>July 25, 2013</td>
<td>Cape Fear Hospital</td>
<td>59 minutes</td>
<td>Transported</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>by Vitalink</td>
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1st D2B (door 1- to-balloon time)  
E2B (EMS arrival on scene-to-balloon time)