Arrest Rates Decline Post-Implementation of Nurse Led Teams

Nicole Lincoln MS, RN, APRN-BC, CCRN
Date June 16, 2016
Time: 2:45 pm - 3:15 pm
BOSTON MEDICAL CENTER (BMC)

315,000 Member Health Plan

More Than 5,000 Employees

Network of 14 Community Health Centers

482 Bed Teaching Hospital

Largest Provider of Trauma and Emergency Services in New England

860,000 Outpatient Visits Per Year

Primary Teaching Hospital of B.U. School of Medicine

New England’s Largest Safety-Net Hospital
QUALITY CARE AND ENGAGEMENT

BMC FY2015 Update Dashboard

- Quality
  - Mortality
  - Preventable Harm
  - Outpatient access
  - Hospital readmissions
  - ED Length of Stay
  - Diversity

- Efficiency
  - Operating income
  - Hospital length of stay
  - BMCHP members using BMC*

- Satisfaction
  - Patient satisfaction
  - Employee engagement

- Total Revenue
  - Net patient service revenue
  - DSTI supplemental funding
  - Volume

Our focused 2016 priorities

1. Quality of Care
   Key measure: Preventable harm

2. Patient Experience
   Key measure: IP & OP satisfaction

3. Growth
   Key measure: Volume

#VITAL2016
OBJECTIVES

To discuss the impact of the dedicated Critical Care Resource Nurse (CRN) role on the nurse led Rapid Response Team (RRT) in an inner city safety net academic medical center.

» To evaluate front-line staff nurse satisfaction with the newly implemented role

» To assess the clinical benefit to both nurse and patient associated with the availability of the dedicated CRN role
RAPID RESPONSE TEAMS

Most RRT in hospitals are led by critical care nurses with the goal to empower, educate, and support the bedside nurse during clinical deterioration of a patient (Smith & Guiliano, 2010).
AACN SYNERGY MODEL

RRT BACKGROUND AT BMC

• IHI 100,000 Lives Campaign in 2005

• At an inner city safety net academic medical center, RRT began in October 2006

• The dedicated role of the critical care resource nurse (CRN) was developed by leaders at this institution and was added as an integral part of the RRT in August 2008
# REASONS TO CALL RRT

If the patient displays any of the following “EARLY WARNING SIGNS,” Call 1-1111 and request the Rapid Response Team without delay. Then call the patient’s primary team physician.

<table>
<thead>
<tr>
<th>Staff Concerned/Worried</th>
<th>“THE PATIENT DOES NOT LOOK/ACT RIGHT,” gut instinct that patient is beginning a downward spiral even if none of the physiological triggers have yet occurred</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in Respiratory Rate</td>
<td>The patient’s RESPIRATORY RATE is less than 8 or greater than 30</td>
</tr>
<tr>
<td>Change in Oxygenation</td>
<td>PULSE OXIMETER decreases below 90%</td>
</tr>
<tr>
<td>Labored Breathing</td>
<td>The patient’s BREATHING BECOMES LABORED</td>
</tr>
<tr>
<td>Change in Heart Rate</td>
<td>The patient’s HEART RATE changes to less than 40 bpm or greater than 120 bpm</td>
</tr>
<tr>
<td>Change in Blood Pressure</td>
<td>The patient’s SYSTOLIC BLOOD PRESSURE drops below 90 mmHg or rises above 200 mmHg</td>
</tr>
<tr>
<td>Hemorrhage</td>
<td>The patient develops uncontrollable bleeding from any site or port</td>
</tr>
<tr>
<td>Decreased LOC</td>
<td>The patient becomes SOMNOLENT, DIFFICULT TO AROUSE, CONFUSED, or OBTUNDED</td>
</tr>
<tr>
<td>Onset of Agitation/Delirium</td>
<td>The patient becomes AGITATED OR DELIRIOUS</td>
</tr>
<tr>
<td>Seizure</td>
<td>The patient has a SEIZURE</td>
</tr>
<tr>
<td>Other Alterations in Consciousness</td>
<td>ANY OTHER CHANGES IN MENTAL STATUS OR CNS STATUS such as a sudden blown pupil, onset of slurred speech, onset of unilateral limb or facial weakness, etc.</td>
</tr>
</tbody>
</table>

# VITAL2016
CRN ROLES AND RESPONSIBILITIES

• An experienced critical care staff nurse who is not taking a patient assignment in the ICU
• Functions as a circulating nurse who responds to a pager with one way text capability.
• The CRN is paged by RN, MD, and others from the interdisciplinary team who seek a consult for clinical advice.
• There are 2 inpatient campuses at this 500 bed institution each with 1 dedicated CRN per shift on each.
• The CRN role provides coverage on a 24 hours/7days a week basis, 12 hour shifts.
CRN ROLES AND RESPONSIBILITIES

- CRNs round in all areas to provide surveillance and support for nurses or physicians.

- The CRN will determine if any staff have a gut feeling that something is wrong with their patient.

- The CRN rounds to identify patients who need immediate intervention and educates staff on early warning signs to promote an increase in autonomy.

- The CRN seeks to proactively identify a patient that is having an acute change in their clinical presentation that may require a higher level of care.
CRN ROLES AND RESPONSIBILITIES

- Nurses and physicians also utilize the CRN for non-acute needs such as clinical advice, review of policies, and obtaining difficult IV access, or traveling to procedures with patients that need monitoring.

- The CRN acts as the liaison to the Cardiac Catheterization Lab, Interventional Radiology, Operative Services, and the Post Anesthesia Care Unit (PACU).

- Some staff would describe the role as a mobile ICU because CRNs can provide ICU level care on the medical/surgical floors.
CRN ROLES AND RESPONSIBILITIES

• RNs are text paged as a first responder to all acute events, RRT’s, Level 1 trauma, STEMI, CVA, cardiac arrest calls

• The CRN provides support to improve flow in the Emergency Department during traumas, myocardial infarction cases requiring the catheterization lab, cerebral vascular accidents and ICU admissions.
METHODS

Longitudinal retrospective database collection from BMC for FY2005-2012

1. Chi square analyses of proportions of non comfort care deaths in non-ICU patients before and after implementation of the RRTs and the CRN using data from FY 2005-2012
2. Number of rapid response calls
3. Number of non-ICU cardiac arrest events
BOSTON MEDICAL CENTER
RAPID RESPONSE TEAM (RRT) CALLS

Critical Care Resource
nurses join RRT

Months

RRT calls

Oct-06 Jan-07 Feb-07 Mar-07 Apr-07 May-07 Jun-07 Jul-07 Aug-07 Sep-07 Oct-07 Nov-07 Dec-07 Jan-08 Feb-08 Mar-08 Apr-08 May-08 Jun-08 Jul-08 Aug-08 Sep-08 Oct-08 Nov-08 Dec-08 Jan-09 Feb-09 Mar-09 Apr-09 May-09 Jun-09 Jul-09 Aug-09 Sep-09 Oct-09 Nov-09 Dec-09 Jan-10 Feb-10 Mar-10 Apr-10 May-10 Jun-10 Jul-10 Aug-10 Sep-10 Oct-10

#VITAL2016
MEDICAL/SURGICAL UNITS
CODE BLUE CALLS /MONTH FY08-11

![Bar chart showing Code Blue calls from FY08 to FY11. The numbers are as follows:
- FY08: 17.7
- FY09: 16.3
- FY10: 14.2
- FY11: 11.7](chart.png)
MONTHLY CARDIAC ARREST AND RRT CALLS PER CALENDAR YEAR
Despite a 12.6% decline in the proportion of non ICU, non comfort care patient deaths after implementation of the RRT, the findings are not statistically significant, p=0.19
The 20.8% decline in the proportion of non ICU non comfort care patient deaths after implementation of the CCRN are statistically significant, p=0.014.
METHODS

DESCRIPTIVE QUANTITATIVE STUDY DESIGN

1. Anonymous & voluntary survey
   - Convenience sample of inpatient staff RNs, N=149
   - Likert scale range of 1-7, 20 item questionnaire
   - Questions grouped into 3 domains based on the AACN Synergy Model

2. T-Test analyses

3. Assessed nurse satisfaction with CCRN role availability
   - Nurse competency domain
   - Benefit to patient’s clinical outcome
   - Perception of benefit to the system/organization
## ANONYMOUS SURVEY QUESTIONS

Survey Questions: To what degree does the Critical Care Resource at BMC facilitate, encourage, or affect the following... Where 1=not at all and 7=maximum

<table>
<thead>
<tr>
<th>Patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expedite patient care (make it happen faster)?</td>
</tr>
<tr>
<td>Evaluation of care, to ensure patient safety?</td>
</tr>
<tr>
<td>Manage the events of a rapid response?</td>
</tr>
<tr>
<td>Positively affect the delivery of ACLS care during a cardiac arrest?</td>
</tr>
<tr>
<td>Transfer of a critical patient to higher level of care?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nurse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess a patient that you are concerned about?</td>
</tr>
<tr>
<td>Plan a therapeutic intervention? Use of critical thinking skills?</td>
</tr>
<tr>
<td>Perform a new skill, I am nervous about?</td>
</tr>
<tr>
<td>Manage my workload, to attend to all of my patients?</td>
</tr>
<tr>
<td>Increase knowledge level, to learn new things?</td>
</tr>
<tr>
<td>Foster a sense of security, worrying less about my patient?</td>
</tr>
<tr>
<td>Become more effective advocating for my patient with MD’s?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follow BMC policy and procedure?</td>
</tr>
<tr>
<td>Increase in job satisfaction?</td>
</tr>
<tr>
<td>Increase morale on the unit?</td>
</tr>
<tr>
<td>Reduce job related stress?</td>
</tr>
<tr>
<td>Encourage and promote teamwork?</td>
</tr>
<tr>
<td>To create a better nurse practice environment to work in?</td>
</tr>
<tr>
<td>Encourage professional growth, and career advancement?</td>
</tr>
</tbody>
</table>
**There was a statistically significant difference (p<0.05) between the Likert score ratings for Patient/Client domain scoring higher when compared by T- analyses to the other domains of the AACN Synergy Model the RN Competencies and System/Organization.**

<table>
<thead>
<tr>
<th>Domains</th>
<th>Count</th>
<th>Mean (+/- SD)</th>
<th>Median</th>
<th>Range (min-max)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RN competencies</td>
<td>149</td>
<td>6.4 (0.8)</td>
<td>6.6</td>
<td>3.4-7</td>
</tr>
<tr>
<td>Patient/Client</td>
<td>149</td>
<td>6.6 (0.6)*</td>
<td>7.0</td>
<td>3.6-7</td>
</tr>
<tr>
<td>System/Organization</td>
<td>149</td>
<td>6.4 (0.8)</td>
<td>6.7</td>
<td>3.7-7</td>
</tr>
</tbody>
</table>
NEXT STEPS

- EWS to be incorporated into proactive screening process for the CRN

- Plan for enhancing CRN communication with addition of individual CRN cell phones, and embroidered uniforms identifying them, and they now have a dedicated note template to easily identify notes the CRN writes when they consult on a patient

- Several studies point to the possibility that the RRT nurses are ideally positioned to initiate end of life discussions address code status or refer the patient for a Palliative care consult

- Involve staff nurses in the decision making of additions to the CRN role that are needed
QUESTIONS
REFERENCES


