Code Sepsis:
Wake Forest Baptist Medical Center Experience

James R. Beardsley, PharmD, BCPS
Manager, Graduate and Post-Graduate Education
Department of Pharmacy
Wake Forest Baptist Health
Assistant Professor
Pharmacology Course Director
Wake Forest School of Medicine
Wake Forest Baptist Medical Center

- 885-bed academic medical center
- >180 adult ICU beds
- NCI-designated cancer center
- Level 1 trauma center
- Mature Antibiotic Stewardship Program
Where We Came From (2011)

- Early Warning System (EWS) in place
- Rapid Response (RR) Team
- Sepsis order set
  - Antibiotic recommendations based analysis of institution’s pathogens

- Sepsis-related mortality index twice rate of top 10 best-performing University HealthSystem Consortium (UHC) Hospitals
2-Day Kaizen Event

• Participants: nursing, pharmacy, respiratory care, RR, performance improvement, and medical staff from medicine, surgery, neurology, and anesthesiology

• Analyzed data related to sepsis care and outcomes

• Divided into groups to develop solutions
Outcome of Planning Meetings

• Educational campaign
  – House-wide information on sepsis
  – Targeted communication to individual disciplines on importance of performing their duties and doing them promptly

• “Code Sepsis”
  – Standardized process for early identification, communication, and intervention of patients with sepsis
Code Sepsis Process

• RN calls RR and First Call Provider for EWS $\geq 8$
• RR performs sepsis screen
  – If positive ($\geq 2$ SIRS criteria + possible infection), emergency response system contacted
• Text page sent to
  – Inpatient Pharmacy
  – Respiratory therapy
  – Blood gas lab
  – ICU triage nurse
• Each team member provides care
Pharmacy’s Role

• Pharmacy charged with facilitating administration of ABX within 60 minutes
• Divided process into 3 stages
• Stage 1: Time from recognition of probable sepsis to ABX ordering
  – Pharmacist as timekeeper
    • Unit called if no new ABX orders within 15 min
  – Protocol allowing pharmacist to select and enter sepsis ABX if provider is busy with other aspects of care
Pharmacy’s Role (continued)

• Stage 2: Time from ABX order to unit delivery
  – Pharmacists on look out for ABX orders for Code Sepsis patient
  – Priority of ABX order maintained
  – Verbal “these are Code Sepsis ABX” handoffs in each step of medication process

• Stage 3: Time from unit delivery to administration
  – Special stat stickers
  – Guidance to RN regarding ABX administration
# Code Sepsis Implementation Timeline

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>February 2012</td>
<td>Initial Kaizen</td>
</tr>
<tr>
<td>April 2012</td>
<td>Code Sepsis implemented in non-critical care units</td>
</tr>
<tr>
<td>November 2012</td>
<td>Second Kaizen (addressing critical care patients)</td>
</tr>
<tr>
<td>February 2013</td>
<td>Surgical ICU Code Sepsis pilot program</td>
</tr>
<tr>
<td>March 2013</td>
<td>Implementation in the Emergency Department</td>
</tr>
<tr>
<td>April 2013</td>
<td>Implementation in remainder of Surgical ICUs</td>
</tr>
<tr>
<td>July 2013</td>
<td>Implementation in Coronary Care Unit</td>
</tr>
<tr>
<td>August 2013</td>
<td>Implementation in Medical ICUs</td>
</tr>
</tbody>
</table>
Results: Process Metrics

- Mean (±SD) from Code Sepsis page to ABX delivery to floor = 14.1 (±13.7) minutes

<table>
<thead>
<tr>
<th>Metric</th>
<th>Baseline</th>
<th>Code Sepsis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean time to ABX administration (non-ICUs)</td>
<td>396 minutes</td>
<td>51 minutes</td>
</tr>
<tr>
<td>Mean time to ABX administration (ICUs)</td>
<td>427 minutes</td>
<td>31 minutes</td>
</tr>
<tr>
<td>EWS ≥8 generate RR call</td>
<td>39%</td>
<td>80%</td>
</tr>
<tr>
<td>Sepsis bundle within 1 hr</td>
<td>5%</td>
<td>70%</td>
</tr>
</tbody>
</table>
Results: Patient Outcomes

• Sepsis-related mortality index decreased from 1.65 to 0.8
• WFBMC now in top 10 UHC hospitals for this metric
Sepsis-Related Mortality Index

- Code Sepsis Implemented in Non-Critical Care Units
- Code Sepsis implementation in ICUs begins

Mortality Index

- 2011-1 to 2014-1

Discharge Quarter

- Our Institution
- UHC Top 10 Performers
Keys to Success

• Support from Medical Center executives
• Buy-in & enforcement from physician leaders
• Collaboration and communication
  – No blaming
• Awesome PI and Nursing Education staff
• High level of clinical pharmacy practice
Continuing Improvement

• Aligning bundle goals with new Surviving Sepsis Campaign recommendations

• Changed screening from EWS to hypotension
  – MAP < 65 mm Hg
  – Drop in SBP ≥ 40 mm Hg

• Automated alert and documentation tool in EMR
For More Information
