Saving Lives: EWS & CODE SEPSIS

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Last Revision: August 2013
Course Objectives

At the conclusion of this training, you will be able to...

• Explain the importance of early recognition and treatment of sepsis

• Describe the components of the Early Warning Score (EWS)

• Understand the CODE SEPSIS process
From November – December 2011, XX of our patients died from *Hospital Acquired sepsis*...

We used these graphic figures to represent actual deaths in our organization to emphasize the importance of improving sepsis care.
If we were performing at the level of the best academic medical centers, XX lives would have been saved...

We then did some “back of the envelope” calculations to estimate how many might have been saved if our performance improved and highlighted the difference with the green figures.
What are we doing to fix this?

1) Early recognition of deterioration
   - Early Warning Score (EWS)

2) Early treatment for severe sepsis
   - CODE SEPSIS
   - Sepsis Bundle (*including timely administration of antibiotics*)
Our Delay in Sepsis Treatment: Adult Med-Surg Floors

Since we identified time to first dose of antibiotic as the single most important factor our sepsis bundle, we use this slide to highlight the reason why and our baseline performance on this measure.

Only 25% who don’t get antibiotics in the first 12 hours survive.

Kumar et al. Critical Care Medicine 2006 34:1589
Survival Fraction

Hours

The most recent *average* time to antibiotic administration at WFBMC is 53 minutes.

Only 25% who don’t get antibiotics in the first 12 hours survive.

This slide shows our improved performance for floor patients after Code Sepsis.

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Kumar et al. Critical Care Medicine 2006 34:1589
Early Warning Score (EWS)
Early Warning Score (EWS)

**Uses** the patient’s vital signs to predict the risk of dying in the hospital.

**Implemented** in October 2011 for non-critical care floors and replaced Physiologic Instability Criteria (PIC).

**Calculated** in the EMR based on vital signs entered by the CNA and the alertness scale determined by the RN.
Early Warning Score Reminder

• An EWS $\geq 8$ indicates an increased risk of dying. Patients may need further evaluation or treatment for:
  - Respiratory distress
  - Acute myocardial infarction
  - Acute stroke
  - Pulmonary embolism
  - Sepsis
The EWS is calculated by assigning point values to vital signs that are abnormal

<table>
<thead>
<tr>
<th></th>
<th>Early Warning Score = Sum of All Points</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Systolic BP (mmHg)</td>
<td></td>
</tr>
<tr>
<td>≤ 90</td>
<td>3</td>
</tr>
<tr>
<td>91 – 100</td>
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<tr>
<td>101 – 110</td>
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<tr>
<td>111 – 219</td>
<td></td>
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<tr>
<td>≥ 220</td>
<td></td>
</tr>
<tr>
<td>Temp (°F)</td>
<td></td>
</tr>
<tr>
<td>≤ 95</td>
<td>3</td>
</tr>
<tr>
<td>95.1 – 96.8</td>
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<tr>
<td>96.9 – 100.4</td>
<td></td>
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<tr>
<td>100.5 – 102.2</td>
<td></td>
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<tr>
<td>≥ 102.3</td>
<td></td>
</tr>
<tr>
<td>Pulse (bpm)</td>
<td></td>
</tr>
<tr>
<td>≤ 40</td>
<td>3</td>
</tr>
<tr>
<td>41 - 50</td>
<td></td>
</tr>
<tr>
<td>51 – 90</td>
<td></td>
</tr>
<tr>
<td>91 – 110</td>
<td></td>
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<tr>
<td>111 – 130</td>
<td></td>
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<tr>
<td>≥ 131</td>
<td></td>
</tr>
<tr>
<td>Resp Rate (bpm)</td>
<td></td>
</tr>
<tr>
<td>≤ 8</td>
<td>3</td>
</tr>
<tr>
<td>9 - 11</td>
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<tr>
<td>12 – 20</td>
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<tr>
<td>21 – 24</td>
<td></td>
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<tr>
<td>≥ 25</td>
<td></td>
</tr>
<tr>
<td>Oxygen Saturation</td>
<td></td>
</tr>
<tr>
<td>≤ 91</td>
<td>3</td>
</tr>
<tr>
<td>92-93</td>
<td></td>
</tr>
<tr>
<td>94 – 95</td>
<td></td>
</tr>
<tr>
<td>≥ 96</td>
<td></td>
</tr>
<tr>
<td>Inspired O₂</td>
<td></td>
</tr>
<tr>
<td>Room Air</td>
<td></td>
</tr>
<tr>
<td>Any supplement O₂</td>
<td></td>
</tr>
<tr>
<td>Alertness Scale</td>
<td></td>
</tr>
<tr>
<td>Alert</td>
<td></td>
</tr>
<tr>
<td>Voice, Pain or Unresponsive</td>
<td></td>
</tr>
</tbody>
</table>

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Large international studies demonstrate that higher EWS is associated with an increased risk of dying.

Studies at WFBMC have also shown increased risk of dying with higher EWS scores

<table>
<thead>
<tr>
<th>Early Warning Score</th>
<th>Number of Patients</th>
<th>Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>7216</td>
<td>10.6%</td>
</tr>
<tr>
<td>9</td>
<td>3285</td>
<td>12.7%</td>
</tr>
<tr>
<td>10</td>
<td>1116</td>
<td>25%</td>
</tr>
<tr>
<td>11</td>
<td>536</td>
<td>31.5%</td>
</tr>
<tr>
<td>12</td>
<td>186</td>
<td>53.8%</td>
</tr>
<tr>
<td>13</td>
<td>52</td>
<td>96.2%</td>
</tr>
<tr>
<td>14 - 16</td>
<td>46</td>
<td>97.8%</td>
</tr>
</tbody>
</table>

Courtesy Vital Sign Study by Dr. Tony Bleyer
Early Warning Score Details

EWS $\geq 8 \rightarrow$ Mortality greater than 10%

EWS 5 - 7 \rightarrow Increased risk of mortality

EWS 0 - 4 \rightarrow No increased risk of mortality
EWS of 0 – 4
No Need for Action Unless
Patient meets “Call Parameters”

If Patient Meets Call Parameters, RN will:

• Administer any PRN Meds or Interventions as ordered

• Notify 1st Call Provider if no PRN orders, or for any acute change in mental status

• Repeat vital signs in 1 hour and notify 1st Call Provider if patient still meets “Call Parameters”
## Standard Call Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>LOW LIMIT</th>
<th>HIGH LIMIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Temperature</td>
<td>≤ 96.8</td>
<td>≥ 100.5</td>
</tr>
<tr>
<td>Rectal Temperature</td>
<td>≤ 97.8</td>
<td>≥ 101.5</td>
</tr>
<tr>
<td>Ax Temperature</td>
<td>≤ 95.8</td>
<td>≥ 99.5</td>
</tr>
<tr>
<td>Systolic BP</td>
<td>≤ 90</td>
<td>≥ 180</td>
</tr>
<tr>
<td>Diasystolic BP</td>
<td></td>
<td>≥ 100</td>
</tr>
<tr>
<td>Heart Rate</td>
<td>≤ 40</td>
<td>≥ 120</td>
</tr>
<tr>
<td>Respiratory Rate</td>
<td>≤ 12</td>
<td>≥ 24</td>
</tr>
<tr>
<td>$S_pO_2$</td>
<td></td>
<td>≤ 90</td>
</tr>
</tbody>
</table>

**Recommendations**

No Ax temps
Standardized Paging for Call Parameters

- Abnormal Vital Sign = _____ (Example: HR = 160)
- Patient last name
- Patient Location: Tower and Room Number
- Caller’s First Name
- Call Back Number
EWS of 5 – 7
Increased risk of mortality

RN will:
• Follow steps previously outlined if patient meets “Call Parameters”

1st Call Provider will:
• Evaluate and treat vital sign abnormalities
• Consider calling Rapid Response (6-9111) if patient’s EWS is increasing

Upper level/Attending will:
• Be notified of changes in patient’s condition
• Consider transfer to a higher level of care and/or discussion with patient about goals of care if condition is felt to be terminal
EWS ≥ 8
Mortality > 10%

RN will:
• Alert Rapid Response Team (Rapid Response Nurse and 1st Call Provider) to come to the bedside within 5 minutes

Rapid Response Nurse and 1st Call Provider will:
• Assess the patient and perform a severe sepsis/septic shock screening. If screening positive, CODE SEPSIS is initiated.

Patient will:
• Transfer to higher level of care if interventions required cannot be accomplished on the floor
  OR
• Remain on nursing unit if stabilized, and vital signs/EWS is monitored every hour for the next 4 hours
Early Warning Score (EWS) Calculation

1. **NA or RN - Document and FILE Vital Signs in the Vital Signs Flowsheet**
   A. Abnormals will show up in RED font with a red triangle in lower right portion of the cell
   B. Group information will be in the detail report (right side of screen) for abnormal values

2. **WITHIN the hour** of last documented Vitals, the RN should:
   A. Go to the EWS flowsheet, **Add New Column** for current time
   B. **Document** “Alertness” value and File on upper left hand portion of screen
   C. Click on blue **EWS** hyperlink in table of contents to obtain EWS report
      i. The EWS Report will show “Early Warning Score” and points for each documented value
      ii. Click File at the top of the EWS report
Early Warning Score (EWS) Calculation

D. Best Practice Advisory appears based on EWS score
   i. Document either [Action Taken] or [Patient Does Not Meet Criteria]
   ii. Click on Comment icon
      iii. Type in comment as to what type of action taken or reason for not meeting criteria

E. Click [Accept]
F. Close EWS report

Remember...

- All Rows that appear in the EWS flowsheet must be documented to generate an accurate EWS score
  If the score shows an abnormal high (example 9999), either V/S have NOT been documented within the last hour and need to be “retaken” or there is missing data for the V/S resulting in an inaccurate score
Standardized Paging for EWS

• EWS = _____ (Score)
• Patient last name
• Patient Location: Tower and Room Number
• Caller’s First Name
• Call Back Number
CODE SEPSIS
Sepsis is...
A life threatening infection in the bloodstream or body tissues

Sepsis leads to...
Shock, multiple organ failure and death

Sepsis remains...
The primary cause of death from infection

Sepsis deaths can...
Be reduced with early detection and treatment
What is **CODE SEPSIS**?

- A patient emergency requiring immediate action for the treatment of severe sepsis and septic shock.

- A standardized process for:
  - Early identification, communication, and intervention for patients with severe sepsis
  - Implementing the sepsis bundle (including antibiotics) within **ONE** hour
How do we arrive at **CODE SEPSIS**?

- **CNA**
  Enters vital sign information at the bedside

- **Bedside Nurse**
  Measures alertness and generates EWS

  
  EWS ≥ 8 or concern for sepsis

- **Bedside Nurse**
  Notifies Rapid Response & 1st Call Provider

  If (+) screen

- **Rapid Response Nurse**
  Performs Severe Sepsis Screen
What should happen with a **CODE SEPSIS**?

1) The Rapid Response Nurse communicates the need for a CODE SEPSIS to the Bedside Nurse, CNA, or Unit Secretary.

2) The Bedside Nurse, CNA, or Unit Secretary:
   - **Calls 6-9111** for a CODE SEPSIS, which generates a page to Pharmacy, Respiratory Therapy, Blood Gas Lab and the ICU Triage Nurse
   - Pages the 1st Call Provider (if not already at bedside)

3) The 1st Call Provider should *respond immediately to the bedside for a CODE SEPSIS* and initiate the Sepsis Bundle Order Set.
What should happen with a CODE SEPSIS (Continued)?

4) The Rapid Response Nurse, Bedside Nurse, and 1st Call Provider will work together to ensure the appropriate steps are taken. Use the CODE SEPSIS Checklist as a guide.

5) The Bedside Nurse will hang the antibiotics within ONE hour of the positive screen.

6) The 1st Call Provider notifies the Attending Physician so that appropriate changes in the plan of care can be discussed.
Standardized Paging for **CODE SEPSIS**

- CODE SEPSIS
- Patient last name
- Patient Location: Tower and Room Number
- Caller’s First Name
- Call Back Number
Mandatory Attending Notification

The 1<sup>st</sup> Call Provider must always notify the attending physician after evaluating a CODE SEPSIS patient at the bedside. The attending can help with decisions about the antibiotic therapy and the need for transfer to a higher level of care.
Sepsis Bundle Details

• What is the Sepsis Bundle?
  ➢ Evidence-based orders that should be implemented together within **ONE** hour of severe sepsis/septic shock

• Who is responsible for ordering the sepsis bundle?
  ➢ 1st Call Provider
  ➢ PharmD can accept verbal orders for antibiotics when requested by the 1st Call Provider once the source of sepsis has been identified

• Where is the sepsis bundle order located?
  ➢ Order Mgmt → Order Sets and Pathways → ALL SEVERE SEPSIS NON CRITICAL CARE UNITS

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Sepsis Bundle Details (Continued)

• When is the Sepsis Bundle ordered?
  ➢ As soon as the patient screens positive for severe sepsis/septic shock

• What are the key elements of the Sepsis Bundle?
  ➢ Baseline STAT Labs, including ABG with lactate
  ➢ Blood Cultures must be obtained prior to antibiotics
  ➢ Other cultures as indicated
  ➢ Antibiotics: *Initiate or broaden antibiotic coverage and Administer 1st dose within ONE hour*
  ➢ IV Fluid Resuscitation if MAP < 65 or abnormal lactate
  ➢ IV Dopamine if pressor indicated
Sepsis Bundle Order

- This order set is for use in patients with presence or suspicion of infection, at least 2 SIRS criteria, and at least one organ dysfunction.
- Severe Sepsis Algorithm: STARTS with sign of first organ dysfunction
- THE FOLLOWING GOALS OF THERAPY SHOULD BE ACHIEVED IN 6 HOURS:
  A) MAP greater than 65 mmHg
  B) Urine Output greater than 0.5 mL/hour
  C) Antibiotics goal is administration within FIRST HOUR of severe sepsis identification
- NOTE: Physician orders are only in effect for the first 24 hours following sepsis identification

GENERAL
- Transfer Patient / Update Patient Status
  - Transfer Patient
  - Update Patient Status (example: change to inpatient or change to observation)

Isolation
- 0 of 1 selected

Vital Signs
- 2 of 2 selected
  - Vital Signs Every 15 Minutes While Unstable Or Upon Transfer To ICU (see order details)
    - Every 15 min First occurrence Today at 1444 for 1 day
      - Additional information: Intake IMMEDIATELY and maintain while unstable, or upon transfer to ICU, Monitor blood pressure, mean arterial pressure (MAP), heart rate, respiratory rate, and oxygen saturation, Every 15 minutes until patient stabilizes and Rapid Response is able to end call
  - Vital Signs Every Hour Once Patient Stabilizes And Rapid Response Able To End Call
    - Every hour First occurrence Today at 1500 for 1 day

Nursing
- 1 of 1 selected
  - Insert Large Bore Peripheral IV (Minimum 20 Gauge)
    - Once First occurrence Today at 1444
    - For: N Fluids
    - Number of IV’s to insert: 1
    - N size: Other (specify)
    - N size - Other: Large Bore (minimum 20 gauge)

Respiratory
- 1 of 1 selected
  - Oxygen (Adult)
    - Continuous starting Today at 1444 Until Specified
What is the **CODE SEPSIS** Checklist?


- The checklist expedites the sepsis bundle administration process as well as track our performance around timeliness.

- The Rapid Response Nurse will maintain copies of the checklist and will be responsible for tracking the information real time.

- The document is not a part of the Medical Record and will be routed to a member of the Quality Assessment Department.
# CODE SEPSIS CHECKLIST & HANDOFF

**THIS DOES NOT REPLACE THE ORDER SET!**

## CODE SEPSIS SCREENING CRITERIA

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>EWS ≥ 8</td>
</tr>
<tr>
<td>2.</td>
<td>MAP &lt; 65</td>
</tr>
<tr>
<td></td>
<td>or</td>
</tr>
<tr>
<td></td>
<td>At least 2 SIRS criteria</td>
</tr>
<tr>
<td></td>
<td>- Temperature &gt; 100.8 or &lt; 96.8</td>
</tr>
<tr>
<td></td>
<td>- WBC &gt; 12,000 or &lt; 4000</td>
</tr>
<tr>
<td></td>
<td>- Glucose &gt; 120 in non-diabetic</td>
</tr>
<tr>
<td></td>
<td>- New altered mental status-anxiety-egitation</td>
</tr>
<tr>
<td></td>
<td>- HR &gt; 90</td>
</tr>
<tr>
<td></td>
<td>- Respirations &gt; 20</td>
</tr>
</tbody>
</table>

## CLINICAL SUSPICION OF INFECTION

**Code Sepsis Called (Underlined items required for Sepsis Bundle Requirement)**

- Site:

## SEVERE SEPSIS CRITERIA [Any 1 suggests presence of severe sepsis in patients with potential source and 2 SIRS]

- Elevated lactate (whole blood arterial) > 1.25 or venous > 1.7; serum lactate > 2.2
- MAP < 65
- pO2 / FiO2 ratio < 300
- Need for intubation or BiPap
- Platelet count < 80,000 (unless pt receiving chemorx)
- INR > 1.5 or PTT > 60 (unless on anticoagulation therapy)
- Serum creatinine > 2 (acute increase; exclude CKI pts)
- Urine output < 0.5 ml/kg/hr X 2 hour

## CIRCLE ONE BELOW

- Sepsis Bundle already completed:
  - In ED
  - By 1st Team
  - Code Sepsis prev 24 hours
- Unstable “scoop and run”
- Code Sepsis paged, bundle declined by physician
- Code Sepsis activation declined by physician
- Other:

## RAPID RESPONSE NURSE

*Remind physician to document reason for declination

## DIAGNOSTIC EVALUATION FOR SEVERE SEPSIS

- ABG w/ lactate (or VBG if arterial stick contra-indicated)
- CBC/diff, CMP, PT/PTT, troponin, serum lactate, procalcitonin
- Blood cultures X 2 (must be drawn before antibiotics)
- Other cultures as indicated; consider CXR and EKG if not recently done

## SEVERE SEPSIS TREATMENT

- Antibiotics started or coverage broadened within 1 hour
- Fluid Resuscitation for MAP < 65 or Elevated lactate (arterial) > 1.25 or venous > 1.7

## Administration Time

## Mandatory Attending Notification

To discuss diagnosis, level of care and need for source control. Attending physician approval must be documented if antibiotics or fluid resuscitation not initiated for patients who meet severe sepsis criteria.

**Attending (time/dates):**

**1st call Provider (time/dates):**

<table>
<thead>
<tr>
<th>TRANSFERRING RN/MD</th>
<th>RECEIVING RN/MD</th>
</tr>
</thead>
<tbody>
<tr>
<td>(time/dates)</td>
<td>(time/dates)</td>
</tr>
</tbody>
</table>

## CODE SEPSIS Checklist

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*Note: This checklist is not used to replace the order set.*

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__**Note:**__ 
This checklist is designed to ensure that all essential elements of sepsis care are addressed in a comprehensive manner. It is intended to guide clinical decision-making and ensure timely and effective management of patients with suspected or confirmed sepsis. It is not a substitute for sound clinical judgment and adherence to established protocols and guidelines.
REMEMBER: TIME TO ANTIBIOTIC MATTERS

• Mortality increases by 5% – 7% for every hour that antibiotics are delayed.

• The more time it takes to administer antibiotics, the more likely your patients are to die.
Thank you for saving lives!