Sepsis Screening & Code Sepsis in Critical Care Units (Medical, Surgical, & CCU)

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Course Objectives

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

• Explain sepsis syndromes and complications related to sepsis

• Describe the screening process for sepsis in critical care

• Explain the components of Code Sepsis in critical care
Why Sepsis Awareness is Important

Click here to learn about Erin Flatley’s Sepsis Emergency

Approximate running time is 10 minutes.
What is Sepsis?

**Sepsis is...**
A toxic response to an infection

**Sepsis leads to...**
Organ failure, shock and death

**Sepsis is the primary cause of death from infection**

**Sepsis deaths can be reduced through early identification and treatment**
Sepsis Syndromes: A Deadly Progression

**Sepsis:** The body’s **Systemic Inflammatory Response** (SIRS) to infection.

**Severe Sepsis:** Associated with **organ dysfunction**, hypoperfusion, or hypotension. Manifestations of hypoperfusion may include (but are not limited to): **lactic acidosis**, oliguria, or an acute alteration in mental status.

**Septic Shock:** **Severe sepsis + hypotension despite adequate fluid resuscitation.**
Sepsis Creates...
An inflammatory response that leads to organ failure

- Poor Perfusion
- Hypotension
- Hypoxia
- Respiratory Distress
- Edema
- ARDS
- Respiratory Failure
- Renal Damage
- Renal Failure
- Ischemia
- Microvascular Clots
- Tissue Necrosis
- Decreased Blood Flow to Tissues
Why are we focusing on Sepsis?
All Sepsis Mortality Index by Month

2012 Risk Model
Ages 18+, Excludes Normal Newborns and OB
Data Source: University Health System Consortium

We use this slide to share our performance with staff. In addition to our data, we include a second line that shows the sepsis mortality index for the UHC Top Ten best performing academic hospitals.

Mortality Index = \frac{\text{Observed Deaths}}{\text{Risk Adjusted Expected Deaths}}

Code Sepsis Initiative Begins
Delay in Treatment: Adult ICU’s

May 2012 – July 2012 Sample

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

The baseline average time to antibiotic administration at WFBMC is XXX*

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

* This average is based on a sample of Critical Care patients from UHC data.

Kumar et al. Critical Care Medicine 2006 34:1589
After Code Sepsis in Adult ICUs

February 2013 – May 2013

The average time to antibiotic administration in the Surgical ICUs is XX minutes.

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

This slide shows our improved performance after ICU Code Sepsis.
Sepsis Screen & Code Sepsis

Process Details
Overview of Sepsis Screen Process

* If Admission Sepsis Screen is performed within 2 hours of shift change, do not screen again until next shift
** Perform screen anytime you have a concern
*** Per protocol
Sepsis Screening Tool*

Instructions: Perform sepsis screen once per shift (8am & 8pm) and PM (with any suspicion of sepsis). If patient is out of the unit at screening time or for any other data, please make a note on the back of the screen in the Comments section and complete screening as soon as possible.

Section 1: Verify Whether Patient is Snoozed (Criteria on rear of form)
If criteria met, enter the start & end date/times and reason. Circle the Y everywhere snoozed periods. COMPLETE Section 2.

<table>
<thead>
<tr>
<th>First Snooze Reason:</th>
<th>Second Snooze Reason:</th>
<th>Third Snooze Reason:</th>
<th>Fourth Snooze Reason:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Begin Date/Time:</td>
<td>Begin Date/Time:</td>
<td>Begin Date/Time:</td>
<td>Begin Date/Time:</td>
</tr>
<tr>
<td>Print Snooze</td>
<td>Print Snooze</td>
<td>Print Snooze</td>
<td>Print Snooze</td>
</tr>
<tr>
<td>End Date/Time:</td>
<td>End Date/Time:</td>
<td>End Date/Time:</td>
<td>End Date/Time:</td>
</tr>
<tr>
<td>Date</td>
<td>Date</td>
<td>Date</td>
<td>Date</td>
</tr>
</tbody>
</table>

Section 2: Evaluate SIRS Criteria
If criteria met, write most recent value for that criteria. If not, leave blank.

A. MAP < 60
B. Temperature  >101.3 or < 95.5
C. WBC < 4,000 or > 12,000

NO: SIRS Criteria Not Met

If YES and NOT SNOOZED, screen is complete; place in bedside folder.
If YES and SNOOZED, draw a lactate (per protocol), notify 1st Call Provider, and advance to Section 3.
If NO, screen is complete; place in bedside folder.

Section 3: Evaluate Suspicion of Infection
1st Call Provider and bedside nurse evaluate lactate result and infection source. The attending can be consulted as needed.

Lactate Value and Type (Whole Blood Venous - V, Whole Blood Arterial - A, Serum - S)
Time Provider arrived at bedside/Phone conversation occurred

YES: Any reason for potential infection (see guide on rear of form)?
NO: Other reason for SIRS identified/no potential source of infection?

CODE SEPSIS Activated? Y or N?

* Some units may be using an electronic screen in WakeOne.
Section 1: Snooze Criteria

- Snooze Criteria have been developed based on likely patient characteristics to minimize **false positives**.

**Remember:** For snoozed patients, the Systemic Inflammatory Response Syndrome (SIRS) portion of the Sepsis Screening should be completed **unless the patient has DNR Soto Comfort Care Only orders written**.
Section 2: SIRS Criteria

• Evaluate criteria
• Draw CBC (to obtain WBC) if patient meets any other SIRS Criteria and no WBC drawn within last 48 hours
• Disregard WBC for neutropenic patients
• Enter the value in the appropriate box when a criteria is met. If no criteria met, leave blank

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>MAP &lt; 65</td>
</tr>
<tr>
<td>B</td>
<td>Temperature &gt; 101.5 or &lt; 96.8</td>
</tr>
<tr>
<td>B</td>
<td>WBC &gt; 12,000 or &lt; 4,000 (Draw if not drawn within 48 hours and any other criteria met) Disregard WBC for Neutropenic patients (WBC &lt; 1,500)</td>
</tr>
<tr>
<td>C</td>
<td>Heart rate &gt; 90 BPM or &gt; 100 if patient is paced between 90 and 100 BPM</td>
</tr>
<tr>
<td>C</td>
<td>Respiratory rate &gt; 20 BPM or 10% &gt; than ventilator set rate if ventilator set rate is &gt; 20 BPM</td>
</tr>
<tr>
<td>C</td>
<td>SBP &lt; 90 mmHg</td>
</tr>
</tbody>
</table>

NO: SIRS Criteria Not Met

- If YES and SNOOZED, screen is complete; place in bedside folder
- If YES and NOT SNOOZED, draw a lactate (per protocol), notify 1st Call Provider, and advance to Section 3
- If NO, screen is complete; place in bedside folder
Section 2: SIRS Criteria

• If SIRS Criteria met and the patient is not on “snooze,” the nurse draws a lactate

• If SIRS Criteria not met, screen is COMPLETE; Patient should be screened again at the next shift or PRN
When SIRS criteria are met...

- Draw a lactate per protocol and notify the 1st Call Provider. Use nursing judgment with regards to Neutropenic patients.

- If the Lactate is abnormal, the patient may have “cryptic septic shock;” The Bedside Nurse and 1st Call Provider should activate Code Sepsis

- If the Lactate is not elevated, the 1st Call Provider should still assess for a possible source of infection
Measuring Lactates

*Preferred Method*

**Whole Blood Lactate:**

**Abnormal:**
- Arterial: > 1.25
- Venous: > 1.70

- Preferred to diagnose Sepsis, faster turn around time
- Heparinized Blood Gas Syringe
- Send to the Blood Gas Lab
- Mark sample as Arterial or Venous
- If drawing arterial sample, request full ABG

**Serum Lactic Acid:**

**Abnormal:** > 2.2

- More commonly used for serial values to monitor response to treatment
- Gray top tube
- Send to Main Lab
Section 3: Suspicion of Infection

• Bedside Nurse and 1st Call Provider assess patient for potential infection

• If there is a potential infection, Code Sepsis is activated

• If there is not a potential infection, continue to evaluate the source of SIRS

### Section 3: Evaluate Suspicion of Infection

1st Call Provider and Bedside Nurse evaluate lactate result and infection source. The Attending can be consulted as needed.

- Lactate Value and Type (Whole Blood Venous = V, Whole Blood Arterial = A, Serum = S)
- Time Provider Arrived at Bedside/Phone Conversation Occurred
- **YES:** Any Reason for Potential Infection (see guide on rear of form)?
- **NO:** Other Reason for SIRS Identified/No Potential Source of Infection?

- After evaluation by care team, if **YES** and/or **ABNORMAL LACTATE**, activate CODE SEPSIS (Call 6-9111), notify Charge Nurse, and print CODE SEPSIS Checklist.
- After evaluation by care team, if **NO** and **NORMAL LACTATE**, re-evaluate in 12 hours (or as needed).

**NOTE:** If patient has suspected infection or abnormal lactate and care team decides not to activate CODE SEPSIS, 1st Call Provider should notify the Attending **AND** document a note in WakeOne.

**CODE SEPSIS ACTIVATED (Y or N):**
When to Activate Code Sepsis…

• Positive SIRS
• An identified source of infection

OR

• Positive SIRS
• No identified source of infection
• No other cause for meeting SIRS criteria
• An abnormal lactate
A Team Approach…
What is **CODE SEPSIS**?

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

- A standardized process for:
  - Early identification, communication, and intervention for patients with sepsis
  - Implementing the sepsis bundle (including antibiotics) within **ONE** hour
Sepsis Bundle Components

• Baseline STAT Labs, including lactate
• Blood Cultures should be obtained prior to antibiotics if at all possible
• Antibiotics: *Initiate or broaden antibiotic coverage and Administer 1st dose within** one hour of a positive screen
• IV Fluid Resuscitation if MAP < 65 or abnormal lactate:
  ➢ Start with 1 liter NS
  ➢ Fluid Resuscitation Goal is 30ml/kg
What should happen with a **CODE SEPSIS**?

1) The Nurse and 1\textsuperscript{st} Call Provider communicate the need to call a Code Sepsis

2) A member of the team:
   - Calls \textbf{6-9111} for a Code Sepsis, which generates a page to Rapid Response, Pharmacy, Respiratory Therapy, and Blood Gas Lab
   - Prints Code Sepsis Checklist with current time

3) The 1\textsuperscript{st} Call Provider \textit{initiates the “ICU Severe Sepsis” Surgical or Medical Units Order Set immediately}

4) The 1\textsuperscript{st} Call Provider notifies the Attending Physician of Code Sepsis so that appropriate changes in the plan of care can be discussed
What should happen with a CODE SEPSIS?

5) The team works together to ensure the bundle is implemented

6) The bedside Nurse will ensure the antibiotics are hung within **ONE** hour of the positive screen

7) The team will continue to resuscitate and monitor the patient
Roles and Responsibilities
Leading a Code Sepsis

• If a patient screens positive for sepsis, ensure the following things happen:
  ➢ Notify the Charge Nurse
  ➢ Notify the 1st Call Provider (if not already at the bedside)
  ➢ Call 6-9111
  ➢ Print the Code Sepsis Checklist

• Lead the Code Sepsis team through the steps on the checklist

• Document requested times on the checklist
# Code Sepsis Checklist

The checklist is located on ALL desktop computers in the unit. It is pre-populated with the current time and formulas to give you the 60 time frame.

<table>
<thead>
<tr>
<th>Step</th>
<th>(✓)</th>
<th>Target Time</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial Code Sepsis Activation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obtained/Reviewed Whole Blood Lactate from Blood Gas Lab; ENTER TIME DRAWN AT SEPSIS SCREENING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Determined Suspicion of Sepsis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[Provider] Arrived at Bedside; ENTER TIME</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provider Name:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notified Charge Nurse and Called 6-9111</td>
<td></td>
<td>14:30</td>
</tr>
<tr>
<td>Initiated ICU Severe Sepsis Surgical or Medical Units Order Set</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verified if Labs (CBC w/ Diff, 2 Blood Cultures) Drawn within 24 Hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Within 15 minutes of Code Sepsis activation...</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessed and Secured IV Access</td>
<td></td>
<td>14:45</td>
</tr>
<tr>
<td>Initiated Fluid Bolus for MAP &lt; 65 or Abnormal Lactate;* ENTER TIME or N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obtained/Sent Needed Labs (CBC w/ Diff, 2 Blood Cultures, Procalcitonin - optional); ENTER TIME or N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Within 30 minutes of Code Sepsis activation...</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ordered Antibiotics/Contacted Pharmacy</td>
<td></td>
<td>15:00</td>
</tr>
<tr>
<td>Assessed Need for Additional Fluid Resuscitation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessed Need for Vasopressive Agents</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Within 50 minutes of Code Sepsis activation...</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hung New Antibiotics; ENTER TIME or N/A</td>
<td></td>
<td>15:20</td>
</tr>
<tr>
<td><strong>Within 60 minutes of Code Sepsis activation...</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[Provider] Notified Critical Care Attending/R2/MidLevel Attending Name:</td>
<td></td>
<td>15:30</td>
</tr>
<tr>
<td>Completed Documentation in WakeOne</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Form Completed By:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Abnormal Lactate Values: Whole Blood (Arterial [> 1.25], Venous [> 1.70]), Serum Lactic Acid (>2.2)

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**Patient Label**

Form Completed By: ______________________________
Date: _______________
Assisting with a Code Sepsis

• Ensure that Sepsis Screen is part of Admission packet
• Ensure updated ADT screen in WakeOne for accurate Sepsis Screening

When requested:
• Call Code Sepsis (6-9111)
• Print Code Sepsis Checklist
• Get supplies (tubing, etc.)
• Take labs to the Blood Gas Lab and/or Main Lab
• Monitor arrival of drugs through tube system
Assisting with a Code Sepsis

*When requested:*

- Call Code Sepsis (6-9111)
- Print Code Sepsis Checklist
- Get supplies (tubing, etc.)
- Take labs to the Blood Gas Lab and/or Main Lab
- Monitor arrival of drugs through tube system
When you call 6-9111…

• Emergency Communications will ask you a few basic questions

• You will need to provide the Charge Nurse Ascom # as the call back number so that other Code Sepsis team members can communicate with you
Responding to a Code Sepsis

• Serve as a resource to the bedside nurse
• Assist as a telephone liaison to:
  ➢ Coordinate care
  ➢ Serve as a contact person for resources outside of the unit
• Assist with timekeeping of Code Sepsis
Responding to a Code Sepsis

• **Initiate “ICU Severe Sepsis” Order Set:** The nurse needs orders to obtain the appropriate labs and start fluid resuscitation if indicated

• **Contact Attending:** Potential sepsis patients may require additional evaluation and those with definite sepsis may need source control; the attending should be involved in these decisions

• **Be conscientious of clock:** Antibiotics within 1 hour are the most important predictor of survival for patients with severe sepsis or septic shock

• **Document any activity associated with a Code Sepsis in the Progress or Event Note**
Responding to a Code Sepsis

- Code Sepsis Content Experts
- Serve as a resource for completing the steps in the checklist
- Help to keep everyone mindful of the clock
- **Remember:**
  - The primary responsibility of Rapid Response is to Med-Surg areas. The nurses will respond as available to Code Sepsis calls.
  - The Rapid Response Nurse will call the unit if he/she will be delayed.
Responding to a Code Sepsis

• Lead Therapist receives the Code Sepsis page
• Obtain arterial sample for lactate (as needed)
• Check with nurse to verify if cultures or other labs needed
• As needed, take sample to the Blood Gas Lab
Responding to a Code Sepsis

• Run labs as quickly as possible

• Be aware of critical values of lactates
Responding to a Code Sepsis

- Pharmacy Staff receive the Code Sepsis page
- Pharmacy Staff will call the unit after 15 minutes if no orders received
- There is an option for the provider to confer with the Pharmacist for antibiotic selection and dosing
- Pharmacy Staff will call the unit when the antibiotics are sent
What happens to the Checklist?

• The checklist is not a part of the Medical Record.

• Upon completion of the Code Sepsis, place the checklist in the Sepsis folder at the Nurses Station.

• The 1\textsuperscript{st} Call Provider enters a Code Sepsis note.
A Team Approach…
Sepsis is an Equal Opportunity Killer

In the U.S., sepsis kills every 2.5 minutes
References


• Surviving Sepsis Campaign. Implement the Resuscitation Bundle-within the first 6 hours. Retrieved from: http://www.survivingsepsis.org/Bundles/Pages/default.aspx

• www.sepsisalliance.com