SEPSIS CARE:
TAKING THE BUNDLE FROM PAPER TO THE BEDSIDE

Maureen A Seckel, APRN, MSN, ACNS-BC, CCNS, CCRN-K, FCCM, FCNS, FAAN
Critical Care Clinical Nurse Specialist and Sepsis Coordinator
ChristianaCare, Newark, DE
DISCLOSURES

- none
OBJECTIVES

01 Apply knowledge of sepsis definitions, sepsis guidelines and bundles into practice

02 Define current SEP-I process measures

03 Apply research to methods for improving sepsis care and metrics
POLLING QUESTION

Have you seen a drop in your SEP-1 sepsis bundle compliance since 2020?

- Yes
- No
- Unchanged
- Don’t know
1.7 million adults in US have sepsis annually

~350,000 die during their hospitalization or are discharged home to die

1 in 3 adults who die in the hospital had sepsis during that hospitalization

87% of sepsis, or the infection causing sepsis, starts in the community
1. SEPSIS DEFINITIONS (SEPSIS 3)
2. SURVIVING SEPSIS CAMPAIGN: GUIDELINES AND BUNDLES
3. REGULATORY (SEP-1)
SEPSIS DEFINITION HISTORY

**Sepsis-3**
- Sepsis = Infection plus new OD
- Septic Shock = Sepsis plus increased mortality (circulatory/cellular/metabolic abnormalities)

**Sepsis-2**
- Sepsis = Infection plus SIRS
- Severe Sepsis = Sepsis plus organ dysfunction
- Septic Shock = hypotension despite adequate fluid resuscitation

**Sepsis-1**
- Sepsis = Infection plus SIRS
- SIRS criteria
  - Temperature $> 38^\circ C$ or $< 36^\circ C$
  - Heart rate $> 90$ bpm
  - Respiratory rate $> 20$ breaths/min or $\text{PaCO}_2 < 32$ torr
  - WBC $> 12,000$ cell/mm$^3$, $< 4000$ cells/mm$^3$, or $> 10\%$ immature bands
- Severe Sepsis = Sepsis plus organ dysfunction
- Septic Shock = hypotension despite adequate fluid resuscitation

SEPSIS-3 DEFINITION SEPSIS

- Life-threatening NEW organ dysfunction caused by patient response to an infection
- Sepsis starts with an infection but not all infections lead to Sepsis

QUICK SEPSIS-RELATED ORGAN FAILURE ASSESSMENT (QSOFA)

- Tool for non-ICU SEPSIS patients to identify increased mortality risk/organ dysfunction

- RR ≥22
- Altered Mental Status
- SBP ≤100

POSITIVE = ≥ 2 CRITERIA

SEPSIS-RELATED ORGAN FAILURE ASSESSMENT (SOFA)

- Tool for ICU SEPSIS patients to assess organ dysfunction
- Increased risk of mortality \( \geq 2 \) OR INCREASING SCORE OVER TIME

Table 1. Sequential [Seeps-Related] Organ Failure Assessment Score*

<table>
<thead>
<tr>
<th>System</th>
<th>Score</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Respiration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PaO\textsubscript{2}/FiO\textsubscript{2}, mm Hg (kPa)</td>
<td>≥400 (53.3)</td>
<td>&lt;400 (53.3)</td>
<td>&lt;300 (40)</td>
<td>&lt;200 (26.7) with respiratory support</td>
<td>&lt;100 (13.3) with respiratory support</td>
<td></td>
</tr>
<tr>
<td>Coagulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Platelets, \times 10^3/\mu L</td>
<td>≥150</td>
<td>&lt;150</td>
<td>&lt;100</td>
<td>&lt;50</td>
<td>&lt;20</td>
<td></td>
</tr>
<tr>
<td>Liver</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bilirubin, mg/dL (\mumol/L)</td>
<td>&lt;1.2 (20)</td>
<td>1.2-1.9 (20-32)</td>
<td>2.0-5.9 (33-101)</td>
<td>6.0-11.9 (102-204)</td>
<td>&gt;12.0 (204)</td>
<td></td>
</tr>
<tr>
<td>Cardiovascular</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAP ≥70 mm Hg</td>
<td>MAP &lt;70 mm Hg</td>
<td>Dopamine &lt;5 or dobutamine (any dose)\textsuperscript{b}</td>
<td>Dopamine 5.1-15 or epinephrine ≥0.1\textsuperscript{a} or norepinephrine &lt;0.1\textsuperscript{a}</td>
<td>Dopamine &gt;15 or epinephrine &gt;0.1 or norepinephrine &gt;0.1\textsuperscript{a}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central nervous system</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glasgow Coma Scale score</td>
<td>15</td>
<td>13-14</td>
<td>10-12</td>
<td>6-9</td>
<td>&lt;6</td>
<td></td>
</tr>
<tr>
<td>Renal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creatinine, mg/dL (\mumol/L)</td>
<td>&lt;1.2 (110)</td>
<td>1.2-1.9 (110-170)</td>
<td>2.0-3.4 (171-299)</td>
<td>3.5-4.9 (300-440)</td>
<td>&gt;5.0 (440)</td>
<td></td>
</tr>
<tr>
<td>Urine output, mL/d</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Abbreviations:** PaO\textsubscript{2}, fraction of inspired oxygen; MAP, mean arterial pressure; \textsuperscript{a} Dopamine doses are given as \( \mu g/\text{kg/min} \) for at least 1 hour.


*Adapted from Vincent et al."
SEPSIS-3 DEFINITION SEPTIC SHOCK

- Sepsis WITH profound circulatory and cellular/metabolic abnormalities that substantially increase mortality
  - Clinical criteria includes SEPSIS with:
    - Persisting hypotension requiring vasopressors to maintain a MAP ≥ 65 mmHg,
  AND
- Lactate > 2 despite fluid resuscitation

SURVIVING SEPSIS CAMPAIGN

- Surviving Sepsis Campaign initiated in 2002
- Work with Institute for Healthcare Improvement

- First Sepsis Guidelines published in 2004
- 2nd Sepsis Guideline in 2008
- 1st Sepsis Bundles

- Educational programs, initiatives, and PI
- 3rd Sepsis Guideline in 2012

- Process, Promise, and Arise
- 4th Sepsis Guideline in 2017

- 1st Pediatric Sepsis guideline in 2018
- COVID-19 guideline in 2020 with revision in 2021
- 5th Sepsis guidelines in 2021
SURVIVING SEPSIS BUNDLE 2018

https://www.sccm.org/sccm/media/PDFs/Surviving-Sepsis-Campaign-Hour-1-Bundle.pdf
5TH SURVIVING SEPSIS CAMPAIGN INTERNATIONAL GUIDELINES

Published 10/4/21

GRADE methodology

6 Sections

- Screening and Early Treatment
- Infection
- Hemodynamic Management
- Ventilation
- Additional Therapies
- Long Term Outcomes & Goals of Care


Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock 2021

KEY WORDS: adults; evidence-based medicine; guidelines; sepsis; septic shock

INTRODUCTION

Sepsis is life-threatening organ dysfunction caused by a dysregulated host response to infection (1). Sepsis and septic shock are major healthcare problems, impacting millions of people around the world each year and killing between one in three and one in six of those it affects (2–4). Early identification and appropriate management in the initial hours after the development of sepsis improve outcomes.

The recommendations in this document are intended to provide guidance for the clinician caring for adult patients with sepsis or septic shock in the hospital setting. Recommendations from these guidelines cannot replace the clinician's decision-making capability when presented with a unique patient's clinical variables. These guidelines are intended to reflect best practice (Table 1).

(References 5–24 are referred to in the Methodology section which can be accessed at Supplemental Digital Content: Methodology.)

SCREENING AND EARLY TREATMENT

Recommendation

1. For hospitals and health systems, we recommend using a performance improvement program for sepsis, including sepsis screening for acutely ill, high-risk patients and standard operating procedures for treatment.

Strong recommendation, moderate quality of evidence for screening.

Strong recommendation, very low-quality evidence for standard operating procedures.
SCREENING AND EARLY TREATMENT

We recommend using a performance improvement program for sepsis, including sepsis screening for acutely ill, high-risk patients and standard operating procedure for treatment

Strong recommendation, moderate-quality evidence for screening
Strong recommendation, very low-quality of evidence for SOP

- Sepsis improvement programs
  - Sepsis screening
  - Measurement of sepsis bundle performance, patient outcomes, and actions for identified opportunities

SCREENING AND EARLY TREATMENT

We recommend against using qSOFA compared to SIRS, NEWS, or MEWS as a screening tool for sepsis or septic shock.

*Strong recommendation, moderate-quality evidence*

- Originally intended as a predictor of poor outcomes for patients with sepsis but not as screening tool itself
- Studies have shown that qSOFA is more specific but less sensitive for early identification of sepsis than other tools

\[
\text{qSOFA} \\
\text{Positive = 2 or more}
\]

SCREENING AND EARLY TREATMENT

For adults suspected of having sepsis, we suggest measuring blood lactate

Weak recommendation, low quality evidence

- Lactate guideline history
  - **2017**: Suggest guiding resuscitation to normalize lactate (Weak, Low quality)
  - **2012**: Suggest targeting resuscitation to normalize lactate (Grade 2C, Weak, moderate)
    - Lactate normalization may be feasible option if Scvo2 is not available
  - **2008**: “Although lactate may lack precision, elevated levels in sepsis support aggressive resuscitation”
  - **2004**: “Although lactate measurement may be useful, it lacks precision as a measure of tissue metabolic state”

SCREENING AND EARLY TREATMENT

For adults with septic shock, we suggest using capillary refill time to guide resuscitation as an adjunct to other measures of perfusion

Weak recommendation, low quality of evidence

- Capillary refill time (CRT) is the time it takes for the distal capillary bed, usually a finger, to regain color after sufficient pressure has been applied to cause blanching.

Abnormal > 3 seconds

For patients with sepsis-induced hypoperfusion or septic shock, we suggest that at least 30 ml/kg of IV crystalloid fluid should be given within the first 3 hr of resuscitation.

**Weak recommendation, low quality of evidence**

- 30 ml/kg/min was initially based on observational evidence
- Additional studies have supported ~ volume of 28-30 ml/kg/min
- Evidence was downgraded from **STRONG** to **WEAK**


INFECTION

**Antibiotic Timing**

<table>
<thead>
<tr>
<th>Shock is present</th>
<th>Shock is absent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sepsis is definite or probable</strong></td>
<td></td>
</tr>
<tr>
<td>Administer antimicrobials <em>immediately</em>, ideally within 1 hour of recognition.</td>
<td></td>
</tr>
<tr>
<td><strong>Sepsis is possible</strong></td>
<td></td>
</tr>
<tr>
<td>Administer antimicrobials <em>immediately</em>, ideally within 1 hour of recognition.</td>
<td>Rapid assessment* of infectious vs noninfectious causes of acute illness.</td>
</tr>
<tr>
<td></td>
<td>Administer antimicrobials <em>within 3 hours</em> if concern for infection persists.</td>
</tr>
</tbody>
</table>

*Rapid assessment includes history and clinical examination, tests for both infectious and noninfectious causes of acute illness and immediate treatment for acute conditions that can mimic sepsis. Whenever possible, this should be completed within 3 hours of presentation so that a decision can be made as to the likelihood of an infectious cause of the patient's presentation and timely antimicrobial therapy provided if the likelihood is thought to be high.*
INFECTION

For adults with sepsis or septic shock, we recommend prompt removal of intravascular access devices that are a possible source of sepsis or septic shock after other vascular access has been established.

Best practice statement

- Catheter removal is preferred definitive treatment
- Some implanted tunneled catheter infections may be treated with prolonged antibiotics if removal of the catheter is not practical
  - Vascular accessibility
  - Risk of complications with new line
  - Possibility that CVC may not be source

For adults with sepsis or septic shock, we suggest using balanced crystalloids instead of normal saline for resuscitation

Weak recommendation, low quality of evidence

- What are Balanced Crystalloids?
  - SMART trial (2018) compared balanced crystalloid (LR, Plasma-Lyte A) vs NS
  - Post Guideline - BASICS (2021) compared balanced crystalloids (Plasma-Lyte 148) vs NS

HEMODYNAMIC MANAGEMENT

For adults with sepsis or septic shock, we suggest using albumin in patients who received large volume of crystalloids

Weak, low quality of evidence

- Albumin is more costly than crystalloids
- Multiple studies have not shown benefit in mortality
- Evidence suggests
  - Higher MAPs earlier
  - Higher static filling pressures
  - Lower net fluid balances

HEMODYNAMIC MANAGEMENT

Vasoactive Agent Management

- Use norepinephrine as first-line vasopressor
  - For patients with septic shock on vasopressors
- Target a MAP of 65 mm Hg
- Consider invasive monitoring of arterial blood pressure
  - If central access is not yet available
    - Consider initiating vasopressors peripherally*
  - If MAP is inadequate despite low-to-moderate dose norepinephrine
    - Consider adding vasopressin
- If cardiac dysfunction with persistent hypoperfusion is present despite adequate volume status and blood pressure
  - Consider adding dobutamine or switching to epinephrine

*When using vasopressors peripherally, they should be administered only for a short period of time and in a vein proximal to the arterial flashback.

HEMODYNAMIC MANAGEMENT

For adults with septic shock, we suggest starting vasopressors peripherally to restore mean arterial pressure rather than delaying initiation until a central venous catheter access is secured

*Weak recommendation, very low quality of evidence*

- Systematic reviews
  - Extravasation 3.4% with no reports of tissue necrosis or limb ischemia
  - Most patients have no long-term sequelae
- Meta-analysis
  - 85% extravasations occurred catheters distal to antecubital fossa
  - Infusions < 6 hours were unlikely to cause local tissue injury

Do you have a policy for peripheral vasopressors at your facility?

- Yes
- No
- In process
HEMODYNAMIC MANAGEMENT

For adults with septic shock, we suggest using invasive monitoring of arterial blood pressure over noninvasive monitoring, as soon as practical and if resources are available.

Weak recommendation, very low quality of evidence

- Discrepancies in cuff vs invasive is more pronounced in shock
- Systematic review showed that risk of limb ischemia and bleeding:
  - Radial arterial line <1%
  - Femoral arterial line <1% - 1.58%

SEP-I EARLY MANAGEMENT BUNDLE, SEVERE SEPSIS/SEPTIC SHOCK

DEVELOPMENT OF SEP-1

- 7/1/22-12/31/22 – SEP-1 Version 5.12
- 1/1/23-6/30/23 – SEP-1 Version 5.13

Current National Average 57%

https://qualitynet.cms.gov/inpatient/specifications-manuals#tab2
Inpatients, ≥ 18 years with ICD-10 CM Principal or other diagnosis code of sepsis, severe sepsis or septic shock, and not equal to U07.1

**SEP-1**

**START**

ALL within 3 hours
- Initial lactate measure
- Antibiotic
- Blood cultures before antibiotic

AND within 3 hours of initial hypotension OR Septic Shock
- 30 mL/kg crystalloids

AND within 6 hours if LA ≥ 2
- Repeat LA

AND within 6 hours of Septic Shock, ONLY if hypotension persists after fluids
- Vasopressors

AND within 6 hours of Septic Shock, ONLY if hypotension persists after fluids OR initial LA ≥ 4
- Repeat volume status and tissue perfusion assessment

END?
SEP-1 EXCLUSIONS

Within 6 hours of presentation of Severe Sepsis or Septic Shock
- Comfort or Palliative Care
- Administrative contraindication to care
- Discharge

Other
- LOS > 120 days
- Transfer from acute care facility (LTAC, other hospital, free standing ED, etc.)
- Participating in clinical trial for sepsis, severe sepsis, septic shock
- IV antibiotics for > 24 hours prior to presentation of severe sepsis
OTHER SEP-I CRITERIA
PREGNANT 20 WEEKS – DAY 3 POST DELIVERY

- NEW SEP-1 5.12 (7/1/22-12/31/22)
- What is included?
  1. Defines hypotension as SBP <85 mmHg or MAP <65 mmHg
  2. Do not use lactate obtained during active delivery
     - Documentation of uterine contractions resulting in cervical change through delivery or childbirth
SEVERE SEPSIS OR SEPTIC SHOCK TIME

**Severe Sepsis Time**
- No longer arrival to ED
- Combination:
  - Provider note source of infection
  - SIRS (2)
  - OD (1)

**Septic Shock Time**
- Provider documentation
- Severe Sepsis AND Persistent Hypotension
- Severe Sepsis AND initial LA ≥ 4
LA, ANTIBIOTIC, BC

**LA**
- If 2\textsuperscript{nd} LA > 2 AND higher than initial, must repeat within 6 hours
- Example
  - 21:08 LA 2.1
  - 00:40 LA 2.6
  - 05:00 LA 2.3
- Document any delay due to difficult stick or refusal

**Antibiotic**
- Any IV antibiotic
- Within 24 hours prior to or within 3 hours of Severe Sepsis

**BC**
- If delay due to difficult stick and documented (nursing or provider), may give antibiotic first and obtain BC ASAP
- 1 set blood cultures passes

**ALL within 3 hours**
- Initial lactate measure
- Antibiotic
- Blood cultures before antibiotic
HYPOTENSION

- **Hypotension** = 2 measures (SBP < 90, MAP < 65, or decrease in SBP > 40 within 3 hours of each other without other causes)
  - Exclusions: OR, IR, delivery, CPR, conscious sedation, or provider documentation

- Example: provider documentation that BP normal for the patient, due to a chronic condition, a medication, acute condition, acute on chronic condition, or due to an acute condition that has a non-infectious source/process
  - **Hypotension due to acute onset of uncontrolled AFib**
  - **BP normally < 90 mmHg, patient on midodrine for ESRD**

- **AND within 3 hours of initial hypotension OR Septic Shock**
  - 30 mL/kg crystalloids
Fluids

- Provider may order less than 30 mL/kg crystalloids for the following:
  - Concerns for heart failure, renal failure, concern for fluid overload, or patient responded to lesser volume
- **MUST** order a targeted volume **AND** reason **MUST** be documented by the provider
  - Examples
    - *1500 mL bolus ordered due to heart failure*
    - *Smaller volumes bolus given of total 500 mL due to fluid overload*
    - *Bolus stopped; patient responded to first liter*

**AND** within 3 hours of initial hypotension **OR** Septic Shock
- 30 mL/kg crystalloids
MORE FLUIDS

- Calculated fluids must be given 6 hours prior or through 3 hours after initial hypotension OR septic shock presentation (don’t forget about EMS)
- May be within 10% of targeted volume
  - 104 kg X 30 mL/kg = 3120 mL targeted volume
  - 3000 mL bolus ordered = (3120 – 10% = 2808) PASS
- Any crystalloids over 125 mL/hour can be considered a bolus (Don’t forget about Vancomycin)
PERSISTENT HYPOTENSION

- Nurse/tech must document BP within the hour of 30 mL/kg or targeted fluid completion
- Example
- And, if SBP < 90 or MAP < 65, a second BP must be documented within that same hour
  - Targeted fluids 1500 mL completed 17:20
    - 17:30 SBP 86
    - 18:10 SBP 92 PASS

AND within 3 hours of initial hypotension OR Septic Shock
- 30 mL/kg crystalloids
VASOPRESSORS

- Vasopressor administration at septic shock presentation up to 6 hours after demonstrated by persistent hypotension after fluids
- May give peripherally rather than delay
  - Facility protocol/criteria

AND within 6 hours of Septic Shock, ONLY if hypotension persists after fluids
- Vasopressors
SEPSIS REASSESSMENT

- Provider documentation; 3 options after start of fluids and within 6 hours of Septic Shock time

- **Option 1**
  Performing or completing Physical exam, *perfusion reassessment, sepsis or septic shock focused exam, sepsis reassessment, or systems review*

- **Option 2**
  5/8 measures documented;
  - PaO2
  - Capillary refill
  - Cardiopulmonary assessment
  - Peripheral pulses
  - Shock index
  - Skin color or condition
  - Urine output
  - Vital signs

- **Option 3**
  One of the following:
  - CVP
  - ScvO2, Svo2
  - Echocardiogram
  - Fluid challenge or PLR

AND within 6 hours of Septic Shock, ONLY if hypotension persists after fluids OR initial LA ≥ 4
  - Repeat volume status and tissue perfusion assessment
PROPOSED OUTCOME MEASURE (CMS MEASURE)

- Outcome Measure Recommendations
  - 30-day mortality
  - Community-acquired sepsis
  - Define sepsis criteria using structured EHR fields and ICD-10-CM diagnosis

- Exclusions
  - Age < 18 or > 115
  - Uncertainty patient sex or date of death
  - Discharged AMA within X hours of presentation
  - Hospice enrollment
  - Prior inpatient sepsis within 30-day window
  - Attribution of mortality to first hospital in transferred sequence

IMPROVING SEPSIS CARE AND METRICS
WORD CLOUD

- One to two words to describe biggest barrier to improving sepsis care?
AHRQ OVERVIEW OF IMPROVEMENT MODELS

1. Emphasis on leadership;
   - Hold people accountable
   - Communicate vision and strategy
   - Eliminate cultural and other barriers

2. Clear goals

3. Use of measurement and analysis (identify gap and guide solution)

4. Emphasis on stakeholders as participants

5. Use of structured, iterative processes to implement interventions
   - And support analysis and implementation

6. Monitoring of front-line clinical activity (observations)

7. Report process data as feedback on effects of change or to track the progress of the implementation process

8. Transparent Metrics

IHI MODEL FOR IMPROVEMENT

What are we trying to accomplish?

How will we know that a change is an improvement?

What change can we make that will result in improvement?

https://www.ihi.org/resources/Pages/HowtoImprove/default.aspx
### Sepsis Review Sheet

**Providers:**

**Nurses:**

---

#### 3 Hour Bundle

<table>
<thead>
<tr>
<th>Metric Met</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lactate 3.9 (resulted 10:40)</td>
<td>☑ Yes ☐ No</td>
</tr>
<tr>
<td>Blood Cultures Ordered 10:21, obtained 10:15</td>
<td>☑ Yes ☐ No</td>
</tr>
<tr>
<td>Antibiotic Cefepime (ordered 10:21, given 11:52) Vanco (ordered 10:21, given 12:50)</td>
<td>☑ Yes ☐ No</td>
</tr>
</tbody>
</table>

**Fluid Resuscitation with 30 mL/kg or targeted volume**

- 1L NS (ordered 10:46, given 10:56)
- 1L NS (ordered 10:46, given 11:52)
- 1L NS (ordered 10:46, given 12:50)

<table>
<thead>
<tr>
<th>Metric Met</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ Yes ☐ No</td>
<td>Weigh 49 kg x 30 = 1470 Total volume 3500 with vanco Fluid Time to Targeted infusion 11:15</td>
</tr>
</tbody>
</table>

**Persistent Hypotension**

- 11:09 SBP 90
- 11:11 SBP 85
- 11:36 SBP 78

<table>
<thead>
<tr>
<th>Metric Met</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ Yes ☐ No ☐ NA</td>
<td>Need BP documented within hour of targeted fluids</td>
</tr>
</tbody>
</table>

**Repeat Lactate 1.7 (resulted 14:00)**

<table>
<thead>
<tr>
<th>Metric Met</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ Yes ☐ No ☐ NA</td>
<td></td>
</tr>
</tbody>
</table>

**Vasopressors**

- Norepi (ordered 11:35, given 11:46)

<table>
<thead>
<tr>
<th>Metric Met</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ Yes ☐ No ☐ NA</td>
<td></td>
</tr>
</tbody>
</table>

**Provider Reassessment**

- 12:12 Initial lactate 3.9, S/p 3 L IVF. Would not give additional fluids at this time based on review.

<table>
<thead>
<tr>
<th>Metric Met</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ Yes ☐ No ☐ NA</td>
<td></td>
</tr>
</tbody>
</table>

**Composite bundle measure**

- Pass ☑ Fail ☐
SEPSIS CARE OPPORTUNITIES

Sepsis Screening
- Time zero
- EHR alert(s)
- Manual alert

Bundles and Clinical Care
- Process measures
- Outcome measures
- EHR prompts
- Documentation
- Handoffs
- RRT

Education
- Posters, apps, pocket cards, online resources
- Education program, Grand Rounds
- Rounds, Huddles
- Feedback (data)

Coding
- Over-coding
- Under-coding
- Adding Sepsis 3
RECENTLY PUBLISHED PI EXAMPLES
MULTIDISCIPLINARY ED SEPSIS HUDDLE

- 999 bed Academic center and Level 1 trauma center
- **Gap analysis** revealed communication key area of focus
- Intervention
  - Sepsis Huddle with checklist
  - After positive screen
  - Provider, nurse, ED pharmacist
- Results (statistically significant)
  - Time 0 to antibiotics and first lactate

ED NURSE SEPSIS IDENTIFICATION TOOL

- 310 bed hospital
- **Gap analysis** revealed failure to recognize early signs/symptoms
- Intervention
  - ER nurse sepsis screening tool (paper)
- Results (statistically significant)
  - Time to bundle completion
  - Time to antibiotics

**ER Nurse Sepsis Identification Tool**

1. ID patients with 2 or more SIRS indicators at triage
2. If positive, “code sepsis” called overhead and ER provider notified to implement sepsis order set
3. Tool was used to track progress of bundles
4. If patient admitted, tool was part of of SBAR process and given to inpatient nurse
5. Tools reviewed weekly

Threatt DL. *J Nurs Care Qual.* 2020;35(2):135-139.
INTERDISCIPLINARY CODE SEPSIS TEAM

- 238 bed Community hospital
- **Gap analysis** revealed failure to improve bundle measures/outcomes
- Intervention
  - ER nurse sepsis screening tool (paper)
- Results
  - Improvement in time to each bundle element except antibiotics and blood cultures
  - Statistically significant fluid resuscitation, initial LA, and time to second LA
  - Mortality rates showed steady decline

ED Sepsis-Alert Algorithm

1. Existing electronic sepsis alert to trigger RN completion of full sepsis screen
2. Criteria for Code Sepsis Team
   a) Infection with 3 SIRS
3. If positive, RN would call switchboard and state “sepsis alert ED room X, patient name or MRN”
4. Page sent to unit coordinator, technician, pharmacist, RT, and sepsis project lead
5. UC would notify provider
6. Team begin sepsis checklist and order set
7. Checklist used for handoff

NURSE-DRIVEN RRT PROTOCOL

- Acute care area of the study institution
- **Gap analysis** revealed poor bundle compliance
- Intervention
  - Suspected Sepsis Protocol implemented by RRT
  - RRT consists of 1-2 critical care trained RNs
- Results
  - Time to antibiotic ↓’d by ½ (269 min -135 min)
  - Fluid resuscitation volume was higher doubling compliance rate

WHY WE DO WHAT WE DO

https://youtu.be/12Qbn6XfH0
You must be the change you wish to see in the world.

Mahatma Gandhi
THANK YOU

MAUREEN A. SECKEL

mseckel@christianacare.org

Newark, Delaware
United States

Pictures from Microsoft Stock Images
• American Association of Critical Care Nurses - https://www.aacn.org/clinical-resources/sepsis

• Center for Disease Control - https://www.cdc.gov/sepsis/index.html


• European Society of Intensive Care Medicine - https://www.esicm.org/resources/sepsis-resources/

• Global Maternity Sepsis Study - https://srhr.org/sepsis/resources/

• Sepsis Alliance – https://www.sepsis.org

• Society of Critical Care Medicine - https://www.sccm.org/SurvivingSepsisCampaign/Home

• UK Sepsis Trust - https://sepsistrust.org/about/about-sepsis/

• World Federation of Critical Care Nurse - https://wfccn.org/sepsis-materials/

• World Health Organization - Sepsis (who.int)

• World Sepsis Day - https://www.worldsepsisday.org/declaration


