Sepsis Awareness Month
Think Sepsis: Time Matters

Sponsored by:
FLORIDA HOSPITAL ASSOCIATION
QUALITY AND PATIENT SAFETY SUMMIT
September 15-16, 2016
Westin Lake Mary | Lake Mary, Florida

Register online at www.fha.org/hen
Sepsis: A Florida Priority

- Leading Cause of Death in Hospitalized Patients (258,000 per year)
- Kills more people than prostate cancer, breast cancer and AIDS combined
- Almost 90,000 patients admitted to Florida Hospitals within Sepsis each year
- Cost to treat -- $30,000-$93,000 per patient
Think Sepsis: Time Matters

Florida College of Emergency Physicians

FHA

QIO/HSAG

ESRD-Region 7
Sepsis is part of a National Project to Reduce Patient Harm

- Hospital Engagement Network (2015-2016)
- QIO Scope of Work
- Hospital Improvement Innovation Networks- 2016-2019
  - Reducing overall harm by 20% and readmissions by 12%
Some progress but not enough

Postoperative Sepsis Rate

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</thead>
<tbody>
<tr>
<td>FL HEN Rate</td>
<td>11.0</td>
<td>16.9</td>
<td>11.1</td>
<td>14.9</td>
<td>7.7</td>
<td>1.9</td>
<td>11.1</td>
<td>2.1</td>
<td>8.9</td>
<td>3.8</td>
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<td>Total HEN Rate</td>
<td>12.5</td>
<td>9.3</td>
<td>8.0</td>
<td>9.3</td>
<td>7.9</td>
<td>6.1</td>
<td>7.9</td>
<td>6.1</td>
<td>8.5</td>
<td>8.0</td>
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<tr>
<td>FL HEN # Hosp.</td>
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<td>27</td>
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<tr>
<td>HEN # Hosp.</td>
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<td>409</td>
<td>414</td>
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<td>403</td>
<td>408</td>
<td>249</td>
<td>217</td>
<td>184</td>
</tr>
</tbody>
</table>

Source: HRET Comprehensive Data System, September 1, 2016
September is Sepsis Awareness Month

- Partnership with QIO/HSAG, FCEP, ESRD Network 7
- Toolkit
- Webinars
- Quarterly forums
Resources to Support Preventing Sepsis

SEPSIS RESOURCES

Sepsis is one of the most misunderstood health care conditions. That is why education is needed, for both patients and medical professionals, to raise awareness of its risks and symptoms. Please utilize the resources listed below to spread awareness and improve your facilities processes and procedures for monitoring and prevention of sepsis.

**For Patients and Families**
- SEPSCA: Sepsis Resources for Patients and Family
- APIC: Infection Prevention and You: Sepsis (PDF)
- International Sepsis Forum (ISF): Understanding Sepsis: A Toolkit from the ISF (PDF)
- NIH National Institute of General Medicine Sciences: Sepsis Fact Sheet

**For Medical Professionals**
- AHA/ACET Sepsis Change Package
- AHA/ACET Sepsis Top Ten Checklist
- Sepsis Alliance: Resources for Medical Professionals
- PSAC HEN Chasing Zero Infections Webinar: Sepsis Overview: Strategies and Actions

**Sepsis**
- **Definitions**
- A prefessional screening tool utilizing end-organ dysfunction predicts sepsis and severe sepsis (2016) American Journal of Emergency Medicine
- Agency for Healthcare Research and Quality (AHRQ): Selected Best Practices and Suggestions to Improve PSIs 13, Prehospital Sepsis (PDF)
- Centers for Disease Control and Prevention (CDC): Sepsis Clinical Guidelines and Tools
- HIT: Severe Sepsis Bundles
- Intermountain Healthcare: Intensive Medicine Clinical Program (IMCP) Severe Sepsis/Septic Shock Bundle Handout/Checklist

SEPSIS FACT SHEET

Sepsis is a serious medical condition: the body’s overwhelming response to an infection. It can lead to tissue damage, organ failure, and even death. The need for treatment is urgent and the risk of mortality and cost is high. Too often, there can be a deadly outcome.

**National Facts**
- Sepsis is the leading cause of death in hospitalized patients (258,000 annually).
- Sepsis is the leading cause of death by infection.
- Sepsis can occur from even a minor infection.
- Sepsis kills more people than prostate and breast cancer and AIDS combined.
- More than 42,000 children in the U.S. develop severe sepsis each year and 10 percent of these children die.
- Sepsis is one of four most costly conditions to treat in the U.S.

**State of Florida Facts**

<table>
<thead>
<tr>
<th>October 2014–August 2018¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult Sepsis Patients (age 18 or older)</td>
</tr>
<tr>
<td>Average Length of Stay (LOS)</td>
</tr>
<tr>
<td>Readmission within 15 days</td>
</tr>
<tr>
<td>Cost of Treatment (per patient)</td>
</tr>
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</table>

¹ Agency for Health Care Administration
A Patient Story

- Abbreviated video (4:39)
  http://www.fha.org/files/video/HEN/Sepsis-video.mp4

- Full-length video (12:01)
  https://vimeo.com/97163230
SEPSIS RECOGNITION

Brian C. Peach, MSN, RN, CCRN
UF Health-Shands Hospital
Medical Intensive Care Unit
University of Florida
College of Nursing
PhD Student
SEPSIS CAN BE CONFUSING....

try to understand #sepsis is like

.....like ..

..it's like trying to smell the color 9

(Sepsis Survivor, n.d.)
Objectives

• By the completion of this webinar, the viewer will be able to:
  
  • Understand the pathophysiology of sepsis
  • Discuss differences between the old and new sepsis definitions
  • Explain why sepsis epidemiology is flawed
  • Identify risk factors for sepsis
  • Recognize assessment findings characteristic of sepsis and septic shock
  • Discuss prevention and early recognition strategies, and future research directions
Sepsis by the numbers

• Now the 10th leading cause of overall death in the United States (U.S.) claiming 220,000 lives annually. (Heron et al., 2009; Joint Commission Center for Transforming Healthcare, 2014).

• Between 28% -50% of patients who develop severe sepsis in the U.S. die, which is more than prostate cancer, breast cancer, and Acquired Immune Deficiency Syndrome (AIDS)-related deaths combined (Wood & Angus, 2004).

• It is the #1 cause of death in intensive care units in high income countries (Russell, 2006).

• Patients with severe sepsis comprise 10%–40% of intensive care unit admissions (Vincent et al., 2006).
Sepsis by the numbers

• The Agency for Healthcare Research and Quality (ARHQ) reports sepsis is the most expensive condition treated in U.S. hospitals, at a cost of more than $20 billion in 2011 (Torio & Andrews, 2013).

• According to the Centers for Disease Control (CDC)’s National Center for Healthcare Statistics, the number of admissions for sepsis climbed from 621,000 in 2000 to 1,141,000 in 2008 (Hall, Williams, DeFrances, & Golosinskiy, 2011).

• The incidence of sepsis increased 8.7% annually between 1979 and 2000 (Martin, Mannino, Eaton, & Moss, 2003).
The Problem

• At present, there is no specific test validated to diagnose sepsis

• There are no approved drugs that target sepsis
Defining Sepsis

• Sepsis 1: 1991-2001
• Sepsis 2: 2001-2016
• Sepsis 3: 2016-?
Sepsis-1 definition (1991-2001)

• Created in a consensus conference in Chicago by members of the Society of Critical-care Medicine (SCCM) & The American College of Chest Physicians (ACCP)

• They hoped to create a definition that would:
  • Help clinicians improve detection which would allow for early therapeutic intervention.
  • Aid in standardizing research protocols to improve dissemination and application of research studies.

• The members recognized that the first definition was broad, but the science to define sepsis wasn’t there yet.

(Bone et al., 1992)
Sepsis-1 definition (1991-2001)

- The Sepsis-1 definition was based in the *Systemic Inflammatory Response Syndrome (SIRS)*

- What is SIRS?
  - An inflammatory process related to infectious and non-infectious causes
  - Common causes of a SIRS response:
    - Infection
    - Trauma
    - Burns
    - Pancreatitis

(Bone et al., 1992)
Sepsis-1 definition (1991-2001)

- **SIRS criteria:**
  - $T > 100.4\, ^\circ\, F$ or $< 96.8\, ^\circ\, F$
  - $HR > 90$ beats/min
  - $RR > 20$ breaths/min
  - $WBC > 12,000$ or $< 4,000$ or $> 10\%$ bands
  - $PCO2 < 32\, mmHg$

- **Sepsis-1 definition:**
  - *Infection + 2 or more SIRS criteria = Sepsis*
  - 3 levels: sepsis, severe sepsis, and septic shock

(Bone et al., 1992)
Sepsis-1 definition (1991-2001)

(Bone et al., 1992)
REMEDIALL sepsis diagram

(Ttsz, n.d.)
Sepsis-2 definition (2001-2016)

- A second consensus conference held, this time in DC w/ members from the SCCM, ACCP + the European Society of Intensive Care Medicine (ESICM), the American Thoracic Society (ATS), and the Surgical Infection Society (SIS)

- Infection + SIRS is too broad

- They identified a number of biomarkers present during sepsis, but their utility in diagnosing sepsis was still unknown.

- They added clinical criteria for inadequate perfusion to the Sepsis-1 definition: Systolic BP< 90mmHg, serum lactate levels >4mmol, signs of end organ damage

(Levy et al., 2003)
Sepsis-2 definition (2001-2016)

(Slide Courtesy Curtis Merritt, DO)

(Ernst, 2012)
Pathophysiology

1. An infectious agent infiltrates the body – directly into the bloodstream, or the respiratory tract, GI or GU tract, skin, etc.

2. An excessive inflammatory response leads to vasodilation, leukocyte accumulation, increased micro-vascular permeability, intravascular volume depletion, myocardial depression, and increased metabolism.

3. This unbridled response leads to an imbalance between oxygen delivery and demand, resulting in global tissue hypoxia. Patients will have abnormally high tissue oxygen needs primarily due to hypermetabolism.

(Sandle, 2014)
Newer findings

• Sepsis involves activation of both pro- and anti-inflammatory responses (Hotchkiss, Monneret, & Payen, 2013)

• Recent research has uncovered endogenous factors that rapidly change the cardiovascular, neurological, endocrine, and hematological systems in response to infection and the body’s inflammatory response (Deutschman & Tracey, 2014; Singer, De Santis, Vitale, & Jeffcoate, 2004).

• These endogenous factors can “amplify” the host response (Singer et al., 2016, p. 804).

• Other factors like the source of infections, comorbidities, and iatrogenic interventions are believed to have a significant impact on the body’s
Alarmins

- A family of endogenous molecules passively secreted from necrotic tissue cells, injured tissue, activated leukocytes, and epithelia.
- Mediate inflammation, and are now one of the targets of therapy research.
- Link innate and active immunity.
- May prove to be valuable biomarkers in terms of diagnostic and prognostic utility.
- Being investigated in relation to autoimmune disorders.
- Examples: high-mobility group protein B1 (HMGB1), S100 proteins, and heat shock proteins (HSPs).

(Chan et al., 2012)
We have a new sepsis definition…

(Farkas, 2016)
The Sepsis-3 definition

- In February 2016, the Society of Critical Care Medicine (SCCM) and the European Society of Intensive Care Medicine (ESICM) announced a monumental change to the sepsis definition at the SCCM annual conference in Orlando, and it was published that same week in the Journal of the American Medical Association (JAMA).

- **Why the change?**
  - 1. Excessive focus on inflammation
  - 2. Misleading model that sepsis follows a continuum from severe sepsis to septic shock
  - 3. Inadequate specificity and sensitivity of the SIRS criteria
  - 4. Multiple definitions are currently used for sepsis, septic shock, and organ dysfunction, which leads to discrepancies in reported incidence and observed mortality.
  - 5. The term “severe sepsis” is redundant.

(Singer et al., 2016)
Flawed Epidemiology

There is significant variability in incidence and mortality of severe sepsis depending on how data is collected. Gaieski, Edwards, Kallan, and Carr (2013) found there is an average annual increase in the incidence of severe sepsis was similar (13.0% to 13.3%) across 4 different collection methods. In-hospital mortality however ranged from 14.7% to 29.9%.

(Gaieski, Edwards, Kallan, Carr, 2013)
New Sepsis-3 definition (as of 02/2016)

“Life-threatening organ dysfunction caused by a dysregulated host response to infection. For clinical operationalization, organ dysfunction can be represented by an increase in the Sequential [Sepsis-related] Organ Failure Assessment (SOFA) score of 2 points or more.”

(Singer et al., 2016, p. 802)
New Septic Shock definition (as of 02/2016)

“A subset of sepsis in which particularly profound circulatory, cellular, and metabolic abnormalities are associated with a greater risk of mortality than with sepsis alone. Patients with septic shock can be clinically identified by a vasopressor requirement to maintain a mean arterial pressure of 65mmHg or greater AND serum lactate level greater than 2mmol/L (>18mg/dL) in the absence of hypovolemic.”

(Singer et al., 2016, p. 802)
What is SOFA?

• A morbidity severity score AND a mortality estimation tool
• Developed from a study of 1,449 patients from 40 intensive care units throughout the world (Vincent et al., 1998).
• The SOFA score is composed of 6 variables, each representing an organ system.
• Each organ system is assigned a point value from 0 (normal) to 4 (high degree of dysfunction/failure).
• The SOFA score ranges from 0 to 24.
• SOFA is superior to the SIRS criteria in terms of predictive validity for in-hospital mortality (Seymour et al., 2016).
What is SOFA?

• Other scoring systems like the Acute Physiologic and Chronic Health Evaluation (APACHE) and Simplified Acute Physiologic Score (SAPS) have only been validated in the first 24 hours of admission, and only to predict mortality (Vincent & Moreno, 2010).

• SOFA should be calculated 24 hours after admission AND every 48 hours thereafter to assess progress (Vincent & Moreno, 2010).

• The mean and highest scores are most predictive of mortality (Ferreira, Bota, Bross, Melot, & Vincent, 2001)
<table>
<thead>
<tr>
<th>Variables</th>
<th>SOFA Score</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td><strong>Respiratory</strong></td>
<td></td>
</tr>
<tr>
<td>Pao₂/Fio₂, mm Hg</td>
<td>&gt;400</td>
</tr>
<tr>
<td><strong>Coagulation</strong></td>
<td></td>
</tr>
<tr>
<td>Platelets ×10³/µL‡</td>
<td>&gt;150</td>
</tr>
<tr>
<td><strong>Liver</strong></td>
<td></td>
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<tr>
<td>Bilirubin, mg/dL‡</td>
<td>&lt;1.2</td>
</tr>
<tr>
<td><strong>Cardiovascular Hypotension</strong></td>
<td></td>
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<tr>
<td>No hypotension</td>
<td></td>
</tr>
<tr>
<td>Mean arterial pressure &lt;70 mm Hg</td>
<td></td>
</tr>
<tr>
<td>Dop ≤5 or dob (any dose)§</td>
<td></td>
</tr>
<tr>
<td>Dop &gt;5, epi ≤0.1, or norepi ≤0.1§</td>
<td></td>
</tr>
<tr>
<td>Dop &gt;15, epi &gt;0.1, or norepi &gt;0.1§</td>
<td></td>
</tr>
<tr>
<td><strong>Central nervous system</strong></td>
<td></td>
</tr>
<tr>
<td>Glasgow Coma Score Scale</td>
<td>15</td>
</tr>
<tr>
<td><strong>Renal</strong></td>
<td></td>
</tr>
<tr>
<td>Creatinine, mg/dL or urine output, mL/d</td>
<td></td>
</tr>
<tr>
<td>&lt;1.2</td>
<td>1.2-1.9</td>
</tr>
</tbody>
</table>

*Norepi indicates norepinephrine; Dob, dobutamine; Dop, dopamine; Epi, epinephrine; and Fio₂, fraction of inspired oxygen.
†Values are with respiratory support.
‡To convert bilirubin from mg/dL to µmol/L, multiply by 17.1.
§Adrenergic agents administered for at least 1 hour (doses given are in µg/kg per minute).
||To convert creatinine from mg/dL. to µmol/L, multiply by 88.4.

(Ferreira et al., 2001)
Predicting SEPSIS-related mortality

<table>
<thead>
<tr>
<th>Maximum SOFA score during ICU stay</th>
<th>Mortality</th>
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<tbody>
<tr>
<td>0-6</td>
<td>&lt;10%</td>
</tr>
<tr>
<td>7-9</td>
<td>15-20%</td>
</tr>
<tr>
<td>10-12</td>
<td>40-50%</td>
</tr>
<tr>
<td>13-14</td>
<td>50-60%</td>
</tr>
<tr>
<td>15</td>
<td>&gt;80%</td>
</tr>
<tr>
<td>16-24</td>
<td>&gt;90%</td>
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Based on the results of 2 prospective studies, SOFA can be used to estimate mortality in patients with sepsis

(Ferreira, et al., 2001; Vincent et al., 1998)
## Predicting SEPSIS-related mortality

<table>
<thead>
<tr>
<th>Score Trend (after first 48 hours)</th>
<th>Mortality</th>
</tr>
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<tbody>
<tr>
<td>Increasing</td>
<td>&gt;50%</td>
</tr>
<tr>
<td>Unchanged</td>
<td>27%-35%</td>
</tr>
<tr>
<td>Decreasing</td>
<td>&lt;27%</td>
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(Ferreira et al., 2001)
qSOFA

“In out-of-hospital, emergency department, or general hospital ward settings, adult patients with suspected infection can be rapidly identified as being more likely to have poor outcomes typical of sepsis if they have at least 2 of the following clinical criteria that together constitute a new bedside clinical score termed quick SOFA (qSOFA): respiratory rate of 22/min or greater, altered mentation, or systolic blood pressure of 100mmHg or less.”

(Singer et al., 2016, p. 802)
qSOFA

HYPOTENSION
\( \leq 100 \text{mmHg} \)

AMS
GCS \( \leq 13 \)

TACHYPINEA
RR \( \geq 22 \text{ bpm} \)

(Gonzalez de Castro, 2016)
QSOFA

• qSOFA was found to have a similar predictive validity to a SOFA score outside the ICU

• qSOFA criteria be used to: “prompt clinicians to further investigate for organ dysfunction, to initiate or escalate therapy as appropriate, and to consider referral to critical care or increase the frequency of monitoring, if such actions have not already been undertaken.” (Singer et al., 2016, p. 808)

• The qSOFA can be thought of as a less comprehensive MEWS score. The MEWS contains the three parts of the qSOFA (mentation, RR, BP)+ temperature, heart rate, and WBC
Differences between old and new definitions

• **SIRS criteria** will soon be out, **SOFA/qSOFA scoring** will be in. Get to know **SOFA and qSOFA**!

• The baseline SOFA score is assumed to be 0 in the absence of known organ dysfunction.

• Instead of 3 categories, ‘sepsis’, ‘severe sepsis’, and ‘septic shock’, there are just 2 (no more ‘severe sepsis’)

(Singer et al., 2016, p. 802)
Algorithm using the new sepsis definition

(Singer et al., 2016, p. 811)
Increasing incidence

Figure 1: Increase in hospital admissions for patients with sepsis

NOTE: Significant linear trend from 2000 through 2008 for both categories.

(Hall et al., 2011)
Why is there an increasing incidence?

- An aging population
- A rise in chronic disease burdens
- Increased usage of invasive procedures
- Immunosuppressant medications & chemotherapy
- Increased organ transplantation
- Antibiotic resistance
- Greater awareness and tracking of sepsis

(Centers for Disease Control and Prevention, 2014)
Who’s at risk?

• EVERYBODY!
• ……but especially those with immature, declining, and suppressed immune systems!!!
• At risk populations: infants, children, older adults, transplant recipients, and individuals with AIDS & cancer (CDC, 2014).
• In one epidemiological study, 71.7% of adult patients with sepsis had cancer, chronic obstructive pulmonary disease (COPD), hypertension, liver cirrhosis, and/or human immunodeficiency virus (HIV) (Martin, Mannino, & Moss, 2006).
Recent MMWR on sepsis

• In the August 26th CDC *Morbidity and Mortality Weekly Report* (MMWR), the CDC and its partners reported on a retrospective study they conducted of 325 patients in 4 NY hospitals.

• 72% of patients had a health care factor during the 30 days PTA or chronic condition that required frequent medical care.

• In 33% of patients, no organism was identified.

• 25% (n=82) patients died

Novosad et al. (2016)
Who’s at risk?

7 in 10

A CDC evaluation found 7 in 10 patients with sepsis had recently used health care services or had chronic diseases requiring frequent medical care.

#VitalSigns

www.cdc.gov/vitalsigns/sepsis

(Centers for Disease Control and Prevention, 2016a)
Signs of sepsis

Healthcare providers are key to preventing infections and illnesses that can lead to sepsis.

**EDUCATE** patients and their families about the early symptoms of severe infection and sepsis, and when to seek care for an infection, especially those at higher risk.

**REMIND** patients that taking care of chronic illnesses helps prevent infections.

**ENCOURAGE** infection prevention measures, such as hand hygiene and vaccination against infections.

**Common infections can lead to sepsis.**

Among adults with sepsis:

- 35% had a lung infection (e.g., pneumonia)
- 25% had a urinary tract infection (e.g., kidney infection)
- 11% had a type of gut infection
- 11% had a skin infection

**Know the signs and symptoms of sepsis.**

- Shivering, fever, or very cold
- Extreme pain or discomfort
- Clammy or sweaty skin
- Confusion or disorientation
- Short of breath
- High heart rate

(Source: CDC Vital Signs, August 2016)
Signs of sepsis

**SIRS Criteria:**
- Temp < 36°C or > 38°C
- HR > 90 beats per minute
- RR > 20 breaths per minute or \(pCO_2<32\) mmHg
- WBC < 4,000 or > 12,000 or > 10% bands

**Other common signs/symptoms:** hypotension (SBP<90 mmHg), change in mental status, decreasing urine output, skin changes

(Fortuna Faveat, 2008)
Assessment

• **Assess for a source of infection**
  - CNS or other source: Mental status changes (could be a CNS infection, but may be related to a source from elsewhere, particularly in the elderly), e.g. lethargy, obtunded, agitated, anxious, combative, confusion. **SUNDOWN PHENOMENON**

  • Head and neck infection: Inflamed/swollen ear drums, sinus tenderness, nasal congestion/exudate, pharyngeal erythema and exudate, inspiratory stridor, cervical lymphadenopathy

  • Respiratory infection: Tachypnea, hypoxia, adventitious sounds, increased sputum production, report of difficulty swallowing/choking with food or fluid intake, increased O2 requirement and/or inhaler/nebulizer use
Assessment

- Assess for a source of infection (continued)
  - Abdominal cavity and GI infections: Abdominal distention, localized tenderness, guarding or rebound tenderness, rectal tenderness or swelling, N/V/D
  - GU and Pelvic infections: Costovertebral tenderness, pelvic tenderness, cervical discharge, burning with urination, malodorous or cloudy urine
  - Skin infections: Wounds, infected incisions, previous line sites
Assessment

• Assess for **signs/symptoms of hypoperfusion**
  • Systolic blood pressure [SBP] <90 mmHg, mean arterial pressure <70 mmHg, or a decrease in SBP >40 mmHg (baseline SBP may vary)
  • HR>90 beats per min
  • Lactic acid level>2 mmol/L (>4 is severe sepsis)
  • Obtundation or restlessness
  • Oliguria or anuria
  • Warm, flushed skin may be present in the early phases of sepsis. As sepsis progresses to shock, the skin may become cool due to redirection of blood flow to core organs and/or vasopressor use.
  • Weak pulses
  • Capillary refill > 3 seconds
  • Mottling (late sign)
Strategies to Improve Recognition

End-tidal CO2 monitoring
EMS Sepsis Alerts
EMS-hospital cooperative training
Best-practice alert (BPA) triage systems in EDs
Early warning scores (e.g. MEWS, PEWS, NEWS, MEOWS, qSOFA)
Rapid response teams
Frequent medical, nursing, and allied health staff education
Sepsis audits to identify deficiencies
Prevention Strategies

WHAT CAN YOU DO TO PREVENT SEPSIS?

1. Get vaccinated against the flu, pneumonia, and any other infections that could lead to sepsis. Talk to your doctor for more information.

2. Prevent infections that can lead to sepsis by
   - Cleaning scrapes and wounds
   - Practicing good hygiene (e.g., hand washing)

3. Know that time matters. If you have a severe infection, look for signs like: shivering, fever, or very cold, extreme pain or discomfort, clammy or sweaty skin, confusion or disorientation, short of breath, rapid breathing, and high heart rate.

(CDC, 2016d)
Why is prevention important?

- After or during their ICU stays, septic patients often develop:
  - Nutritional deficiencies
  - Repeated infections
  - Increased energy requirements
  - Significant organ injury

  (Gentile et al., 2012)

- Patients who were septic have shorter life expectancy even when controlling for age. Dreicher et al. (2012) found patients’ long term survival was **33%**, **23%**, and **20%**, one, five, and eight years out respectively from the sepsis event.

  (Dreicher et al., 2012)
CDC Vital Signs

• A monthly report launched in 2010
• Includes a Morbidity and Mortality Weekly Report (MMWR), a graphic fact sheet and website, a media release, and social media tools.
• The August 26th issue of CDC Vital Signs was about sepsis!
• In this issue, they discussed what is being done at the federal government level, and what can be done by healthcare providers, healthcare CEOs/Administrators, state & local health departments, and patients & families.

(CDC, 2016c)
The federal government is:

- Working to promote and align public health efforts, including: infection prevention, vaccinations, chronic disease management, appropriate antibiotic use, and sepsis prevention and early recognition
- Investigating triggers of sepsis to identify novel prevention strategies and at-risk populations
- Supporting development of new sepsis diagnostic tests and treatments
- Developing more accurate tracking methods to evaluate progress in preventing and treating patients with sepsis
Healthcare providers can:

- Prevent infections. Follow infection control requirements (e.g., hand hygiene) and ensure patients receive recommended vaccines (e.g., flu and pneumococcal).
- Educate patients and their families. Stress the need to prevent infections, manage chronic conditions, and seek care if signs of severe infection or sepsis are present.
- Think sepsis. Know sepsis signs and symptoms to identify and treat patients early.

(CDC, 2016c)
CDC Vital Signs: Sepsis

• Healthcare providers can:
  • Act fast. If sepsis is suspected, order tests to determine if an infection is present, where it is, and what caused it. Start antibiotics and other medical care immediately. Document antibiotic dose, duration, and purpose.
  • Reassess patient management. Check patient progress frequently. Reassess antibiotic therapy 24-48 hours or sooner to change therapy as needed. Be sure the antibiotic type, dose, and duration are correct.

(CDC, 2016c)
CDC Vital Signs: Sepsis

• Health care facility CEOs/administrators can:
  • Make infection control a priority. Ensure a strong link between infection control and prevention, sepsis early recognition, and appropriate antibiotic use programs.
  • Train healthcare providers and front-line staff to quickly recognize and treat sepsis.
  • Collaborate with health departments and other health care facilities within your area to improve infection control.

(CDC, 2016c)
CDC Vital Signs: Sepsis

• State and local health departments can:
  • Promote sepsis prevention and early recognition, vaccination, chronic disease management, and infection prevention in health care facilities and community settings.
  • Review actions other states and organizations have taken to improve sepsis early recognition and treatment: http://go.usa.gov/xjxnz (CDC, 2016c)
• Patients & families can:
  • Learn sepsis signs and symptoms. Know if you are at higher risk. If sepsis is suspected, get immediate medical attention. Ask, “Could it be sepsis?”
  • Talk to a healthcare provider about managing chronic conditions and getting vaccines.
  • Practice good hygiene, such as handwashing.

(CDC, 2016c)
Opportunities for future research

Characterization of population subsets with molecular signatures (e.g. transcriptomic, metabolomic, proteomic) (Singer et al., 2016)

Development of a gold standard diagnostic test for sepsis, perhaps using biomarkers (Singer et al., 2016)

Epidemiological research based on data collected by clinicians using the Sepsis-3 definition

Additional validation studies of qSOFA

Drug therapies targeted at the sepsis response
This is a 2 part series, and the 2nd webinar on evidence-based management strategies and the new Centers for Medicare and Medicaid Services (CMS) sepsis bundle requirements will be held on Monday, September 26th, 2016, 01:00PM-02:30PM.
Shameless Plug

- **Topics covered in the 2nd webinar**
  - The Rivers Trial- Early Goal Directed Therapy
  - Results of three large sepsis trials (PROCESS, ARISE, PROMISE) published in the last 2 years
  - The Society of Critical Care Medicine’s Surviving Sepsis Campaign
  - The Centers for Medicare and Medicaid Services (CMS)’s new sepsis bundles
  - Medical management strategies for severe sepsis and septic shock
  - EMS and ED-based sepsis initiatives and protocols
FHA Resources

Please keep in mind that FHA has sepsis order sets, bundles, checklists, lists of subject matter experts, and other free resources that are only a couple clicks away.
Questions?

Fire Away!
Hosted by the FHA Hospital Engagement Network

FLORIDA HOSPITAL ASSOCIATION
QUALITY AND PATIENT SAFETY SUMMIT
September 15-16, 2016
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Register online at www.fha.org/hen
Eligibility for Nursing CEU requires submission of an evaluation survey for each participant requesting continuing education: https://www.surveymonkey.com/r/sepsis090916

• Share this link with all of your participants if viewing today’s webinar as a group.

• Be sure to include your contact information and Florida nursing license number.

• FHA will report 1.5 credit hour to CE Broker and a certificate will be sent via e-mail.
Thank You!

Contact the FHA HEN Team- HEN@fha.org or 407-841-6230

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