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| <b>Track:</b> Hospital Medicine   |  |  |   |
| <b>Body System:</b> Emergency-Urgent Care   |  |  |   |
| <b>Session Topic:</b> Evaluation and Management of Sepsis/Septic Shock in Adults  |  |  |   |
| <b>Educational Format</b>   |  | <b>Faculty Expertise Required</b>  |   |
| <b>REQUIRED</b>   | Interactive Lecture                    | Expertise in the field of study. Experience teaching in the field of study is desired. Preferred experience with audience response systems (ARS). Utilizing polling questions and engaging the learners in Q&A during the final 15 minutes of the session are required.  |   |
| <b>OPTIONAL</b>   | Problem-Based Learning (PBL)           | Expertise teaching highly interactive, small group learning environments. Case-based, with experience developing and teaching case scenarios for simulation labs preferred. Other workshop-oriented designs may be accommodated. A typical PBL room is set for 50-100 participants, with 7-8 each per round table. <u>Please describe your interest and plan for teaching a PBL on your proposal form.</u>   |   |
| <b>Professional Practice Gap</b>  |  | <b>Learning Objective(s) that will close the gap and meet the need</b>   | <b>Outcome Being Measured</b>   |
| <ul style="list-style-type: none"> <li>• There is often poor adherence to sepsis/septic shock clinical guidelines.</li> <li>• Physicians have knowledge and practice gaps with regard to screening for sepsis; knowing when to transfer a patient to the ER; when to order antibiotics; and guidelines for resuscitation</li> <li>• There are no clear guidelines to help the clinician identify the presence of infection or to causally link an identified organism with sepsis.</li> <li>• A 2016 SCCM/EISCM task force has defined sepsis as life-threatening organ dysfunction caused by a dysregulated host response to infection:</li> </ul> |  | <ol style="list-style-type: none"> <li>1. Recognize the early presentation of sepsis and the tools that aid in early detection and diagnosis.</li> <li>2. Implement evidence-based protocols for initial resuscitation and infection management.</li> <li>3. Establish protocols for hemodynamic support and adjunctive therapy.</li> <li>4. Apply supportive therapy for severe sepsis.</li> <li>5. Recognize indications for admitting a septic patient to ICU.</li> </ol> | Learners will submit written commitment to change statements on the session evaluation, indicating how they plan to implement presented practice recommendations. |
| <b>ACGME Core Competencies Addressed</b> (select all that apply)  |  |  |   |
| X   | Medical Knowledge                      |  | Patient Care  |
|   | Interpersonal and Communication Skills |  | Practice-Based Learning and Improvement   |
|   | Professionalism                        | X  | Systems-Based Practice  |



### Faculty Instructional Goals

**\*NOTE TO FACULTY - This topic is part of the Hospital Medicine Track. Associated topics include: Atrial Fibrillation; Anticoagulation; Skin Infections; & Clostridium Difficile.**

**Expectation:**

- 1. Include an appropriate focus on inpatient care (up to 100%)**
- 2. Collaborate with faculty from associated topics (above)**

Faculty play a vital role in assisting the AAFP to achieve its mission by providing high-quality, innovative education for physicians, residents and medical students that will encompass the art, science, evidence and socio-economics of family medicine and to support the pursuit of lifelong learning. By achieving the instructional goals provided, faculty will facilitate the application of new knowledge and skills gained by learners to practice, so that they may optimize care provided to their patients.

- Provide up to 3 evidence-based recommended practice changes that can be immediately implemented, at the conclusion of the session; including SORT taxonomy & reference citations
- Facilitate learner engagement during the session
- Address related practice barriers to foster optimal patient management
- Provide recommended journal resources and tools, during the session, from the American Family Physician (AFP), Family Practice Management (FPM), and Familydoctor.org patient resources; those listed in the References section below are a good place to start
  - Visit <http://www.aafp.org/journals> for additional resources
  - Visit <http://familydoctor.org> for patient education and resources
- Provide recommendations for recognizing the early presentation of sepsis and the tools that aid in early detection and diagnosis.
- Provide recommendations regarding evidence-based protocols for initial resuscitation and infection management.
- Provide recommendations for hemodynamic support and adjunctive therapy.
- Provide recommendations for supportive therapy for severe sepsis.
- Describe the current practice for treatment and management of the septic patient.
- Provide recommendations for monitoring and treating patients with sepsis and septic shock.
- Provide recommendations for recognizing indications for admitting a septic patient to ICU.
- Discuss when point-of-care analytic testing might benefit patients with a suspected or confirmed diagnosis of sepsis.
- Provide recommendations regarding treatment goals that must be reported to CMS for the treatment of severe sepsis and septic shock.
- Describe updated, evidence-based definitions for sepsis issued by the Society of Critical Care Medicine (SCCM) and the European Society of Intensive Care Medicine (ESICM)
- Provide recommendations regarding guidelines for Medicare reimbursement.
- Provide recommendations to maximize office efficiency and guideline adherence to the diagnosis and management of sepsis/septic shock.



- Provide an overview of newly available treatments, including efficacy, safety, contraindications, and cost/benefit relative to existing treatments.
- Provide instructions regarding the incorporation and use of the PCMH/ACO/Primary Care Core Measure Set into practice.

### Needs Assessment

Sepsis kills more than 258,000 Americans each year and leaves thousands of survivors with life-changing after effects. In fact severe sepsis and septic shock claim one-third of patients hospitalized for these conditions.<sup>1</sup> According to CDC, there are over 1 million cases of sepsis each year, and it is the ninth leading cause of disease-related deaths.<sup>2</sup> Advances in pharmacotherapy and supportive care have improved survival rates; however, mortality rates remain between 25% to 30% for severe sepsis and 40% to 70% for septic shock. Sepsis is responsible for 20% of all in-hospital deaths each year (210,000), which equals the number of annual deaths from acute myocardial infarction.<sup>3</sup>

CME outcomes data from the 2016 American Academy of Family Physicians (AAFP) Emergency and Urgent Care course: *Sepsis Recognition and Management* session, suggests that physicians have knowledge and practice gaps with regard to screening for sepsis; knowing when to transfer a patient to the ER; when to order antibiotics; and guidelines for rehydration.<sup>4</sup> Nearly half (48.3%) of learners from this course indicate a need to seek further education on the topic of sepsis recognition and management.

A review of the literature suggests poor adherence to PALS sepsis guidelines, specifically with regard to poor adherence to fluids, vasoactive agents, and antibiotics and demonstrated some improvement in these parameters after quality improvement interventions.<sup>5</sup> The Agency for Healthcare Research and Quality (AHRQ) recommends that more educational initiatives are necessary to encourage adherence to sepsis guidelines.<sup>1</sup> Differential diagnosis of sepsis is challenging, as several syndromes mimic sepsis, including hypovolemia, acute blood loss, acute pulmonary embolus, acute myocardial infarction, acute pancreatitis, transfusion reaction, diabetic ketoacidosis, and adrenal insufficiency.<sup>3</sup> Additionally, there are no clear guidelines to help the clinician identify the presence of infection or to causally link an identified organism with sepsis.

For about eight in 10 patients, sepsis begins outside the hospital. And, according to a CDC Vital Signs report released Aug. 26, about seven in 10 patients with sepsis had used health care services within the previous month or had a chronic disease that required frequent medical care.<sup>6</sup>

Consequently, said CDC officials, health care visits present important opportunities for physicians to prevent, recognize and treat sepsis before it causes life-threatening illness or death.

Among key findings from the evaluation was that pneumonia was the most common infection leading to sepsis, followed by urinary tract infections, gastrointestinal infections and skin/soft tissue infections. Infants younger than age 1 year and adults 65 or older were particularly susceptible, as were patients with weakened immune systems and those who had a chronic



medical condition. Although much less common, healthy children and adults also can develop sepsis, especially when the precipitating infection is not recognized early.<sup>7</sup>

In most cases, the specific pathogens that caused the infection leading to sepsis were not identified; when they were identified, the most common were *Staphylococcus aureus*, *Escherichia coli* and various *Streptococcus* and *Klebsiella* species.

Of the 246 adult patients included in the chart review, 65 (26 percent) died during their sepsis hospitalization. Of the 79 pediatric patients whose medical records were reviewed, 17 (22 percent) died while hospitalized for sepsis.

According to agency officials, health care professionals, including family physicians, can play a critical role in protecting patients from infections that may lead to sepsis, as well as in recognizing this complication early, by following a few simple recommendations:

- **Prevent infections.** Follow infection control requirements, such as proper handwashing protocols, and ensure patients get recommended vaccines (e.g., influenza and pneumococcal).
- **Educate patients and their families.** Stress the need to prevent infections, manage chronic conditions and promptly seek care if signs of a severe infection or sepsis develop.
- **Think sepsis.** Know the signs and symptoms to identify and treat patients early.
- **Act fast.** If sepsis is suspected, order tests to determine whether an infection is present, where it is and what caused it. Start antibiotics and other recommended medical care immediately, and document all aspects of the antibiotic regimen.
- **Reassess patient management.** Check patient progress frequently. Reassess antibiotic therapy at 24-48 hours or sooner to modify therapy as needed. Determine whether the type of antibiotics, dose and duration are correct.

Physicians should consider the following evidence-based clinical recommendations:<sup>3</sup>

- Fluid resuscitation is the initial treatment for hypotension in patients with septic shock.
- Vasopressor therapy should be initiated in patients with sepsis when fluid resuscitation fails to restore mean arterial pressure (greater than 65 mm Hg) or continued organ hypoperfusion.
- Antibiotic therapy should be administered within one hour in patients with suspected sepsis.
- Sepsis care bundle protocols decrease sepsis mortality and should be implemented in medical centers.

Additionally, physicians may want to consider current, *Surviving sepsis campaign: international guidelines for management of severe sepsis and septic shock*, guidelines from the Surviving Sepsis Campaign Guidelines Committee including the Pediatric Subgroup.<sup>8</sup> Physicians should also be aware of current FDA warnings and regulatory alerts related to this guideline.<sup>9</sup>

- *November 6, 2013 – Low Molecular Weight Heparins External Web Site Policy: The U.S. Food and Drug Administration (FDA) is recommending that health care professionals carefully consider the timing of spinal catheter placement and removal in patients taking anticoagulant drugs, such as enoxaparin, and delay dosing of anticoagulant medications for some time interval after catheter removal to decrease the risk of spinal column*



*bleeding and subsequent paralysis after spinal injections, including epidural procedures and lumbar punctures. These new timing recommendations, which can decrease the risk of epidural or spinal hematoma, will be added to the labels of anticoagulant drugs known as low molecular weight heparins, including Lovenox and generic enoxaparin products and similar products.*

Recently, a 2016 SCCM/EISCM task force has defined sepsis as life-threatening organ dysfunction caused by a dysregulated host response to infection.<sup>10-13</sup> Physicians need continuing medical education to understand the implications to practice.

These recommendations are provided only as assistance for physicians making clinical decisions regarding the care of their patients. As such, they cannot substitute for the individual judgment brought to each clinical situation by the patient's family physician. As with all clinical reference resources, they reflect the best understanding of the science of medicine at the time of publication, but they should be used with the clear understanding that continued research may result in new knowledge and recommendations. These recommendations are only one element in the complex process of improving the health of America. To be effective, the recommendations must be implemented. As such, physicians require continuing medical education to assist them with making decisions about specific clinical considerations.

#### Resources: Evidence-Based Practice Recommendations/Guidelines/Performance Measures

- Early recognition and management of sepsis in adults: the first six hours<sup>3</sup>
- Surviving sepsis campaign: international guidelines for management of severe sepsis and septic shock<sup>8</sup>
- The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3)<sup>11</sup>
- Surviving sepsis campaign: international guidelines for management of sepsis and septic shock: 2016<sup>10</sup>
- Assessment of Clinical Criteria for Sepsis: For the Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3)<sup>12</sup>
- Developing a New Definition and Assessing New Clinical Criteria for Septic Shock: For the Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3)<sup>13</sup>
- Simple tools to increase patient satisfaction with the referral process<sup>14</sup>
- How to Reduce Your Malpractice Risk<sup>15</sup>

#### References

1. Deaths from septic shock decline when guidelines followed. 2014;
2. Centers for Disease Control and Prevention. Sepsis Questions and Answers. 2015;
3. Gauer RL. Early recognition and management of sepsis in adults: the first six hours. *American family physician*. 2013;88(1):44-53.



4. American Academy of Family Physicians (AAFP). Emergency and Urgent Care Course EOM Report. Leawood KS: AAFP; 2016.
5. Paul R, Neuman MI, Monuteaux MC, Melendez E. Adherence to PALS Sepsis Guidelines and Hospital Length of Stay. *Pediatrics*. 2012;130(2):e273-280.
6. CDC Report Calls for Sepsis Education, Prevention. *AAFP News*. 2016.
7. Novosad SA. Vital signs: epidemiology of sepsis: prevalence of health care factors and opportunities for prevention. *MMWR Morbidity and mortality weekly report*. 2016;65.
8. Dellinger RP, Levy MM, Rhodes A, et al. Surviving sepsis campaign: international guidelines for management of severe sepsis and septic shock: 2012. *Critical care medicine*. 2013;41(2):580-637.
9. U.S. Food and Drug Administration. Low Molecular Weight Heparins: Drug Safety Communication - Recommendations to Decrease Risk of Spinal Column Bleeding and Paralysis. *MedWatch* 2013;
10. Rhodes A, Evans LE, Alhazzani W, et al. Surviving sepsis campaign: international guidelines for management of sepsis and septic shock: 2016. *Intensive care medicine*. 2017;43(3):304-377.
11. Singer M, Deutschman CS, Seymour CW, et al. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). *JAMA : the journal of the American Medical Association*. 2016;315(8):801-810.
12. Seymour CW, Liu VX, Iwashyna TJ, et al. Assessment of Clinical Criteria for Sepsis: For the Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). *JAMA : the journal of the American Medical Association*. 2016;315(8):762-774.
13. Shankar-Hari M, Phillips GS, Levy ML, et al. Developing a New Definition and Assessing New Clinical Criteria for Septic Shock: For the Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). *JAMA : the journal of the American Medical Association*. 2016;315(8):775-787.
14. Jarve RK, Dool DW. Simple tools to increase patient satisfaction with the referral process. *Family practice management*. 2011;18(6):9-14.
15. Achar S, Wu W. How to reduce your malpractice risk. *Family practice management*. 2012;19(4):21-26.