Selected Best Practices and Suggestions for Improvement

PSI 13: Postoperative Sepsis

Why Focus on Sepsis?

- More than 750,000 cases of sepsis are reported in the United States each year. Between 11 percent and 27 percent of ICU admissions have severe sepsis, with mortality rates ranging from 20 percent to more than 50 percent.[1]
- Implementation of the entire Surviving Sepsis Campaign bundle has been associated with documentation of a decrease in mortality.[2]
- Not only does postoperative sepsis cause patient harm, it also significantly increases the cost of patient care. The cost of sepsis care in the United States has been estimated at $400 billion annually.[3]
- Starting in 2015, the postoperative sepsis rate PSI will be one of the measures used for Medicare's Hospital Value-Based Purchasing (as part of a composite indicator) that links quality to payment.[4]

Recommended Practice	Details of Recommended Practice
Screen patients for sepsis.	Develop a 1-page sepsis screening tool; integrate tool into electronic medical record.[2,5]
Use a sepsis resuscitation bundle.	Obtain blood cultures, administer antibiotics, measure serum lactate, and manage fluid status for hypotension and/or lactate $\geq$ 4 mmol/L within 3 hours of sepsis diagnosis.[2,4,6]
Policy and procedure development.	Use Surviving Sepsis Campaign's evidence-based guidelines; include the 3-hour and 6-hour bundles.[2]
Adopt sepsis measures.	Evaluate compliance by using process measures such as door-to-antibiotic time; share reports regularly to communicate progress.[2]

Best Processes/Systems of Care

Introduction: Essential First Steps

- Engage key nurses, physicians and other providers, hospitalists, respiratory therapists, dieticians, and pharmacists from infection control, intensive care, and inpatient units including operating room; and representatives from quality improvement, radiology, and information services to develop time-sequenced guidelines, care paths, or protocols for the full continuum of care.[2]

Recommended Practice: Screen Patients for Sepsis

- Develop a 1 page sepsis screening tool; integrate tool into electronic medical record.[7]
- Identify patients quickly by using a standardized set of physiologic triggers or early warning signs that alert caregivers to respond quickly with appropriate interventions.
- Nurses should assess patients with a history suggestive of a new infection for sepsis at least daily.

- Screening should begin upon arrival at the emergency department or soon after hospital admission if not admitted through the ED.
- Use advanced practitioners or the rapid response team to screen admitted patients for sepsis.
- Develop a list of "triggers" for the rapid-response team to use in screening admitted patients for sepsis.
- Pilot the screening tool with 1 or 2 nursing units. Allow the staff piloting the tool to provide feedback. Incorporate staff feedback with the tool is revised.
- The screening tool should be no longer than 1 page and take only 2 or 3 minutes to complete.

Recommended Practice: Use a Sepsis Resuscitation Bundle

- The sepsis resuscitation bundle has 7 elements.[2]
    - To be completed within 3 hours of identification of sepsis:
        - Measure serum lactate.
        - Collect blood cultures before administration of the initial antibiotic.
        - Administer broad-spectrum antibiotics.
        - Administer 30 mL/kg crystalloid for hypotension or lactate $\geq$ 4mmol/L.
    - To be completed within 6 hours of identification of sepsis:
        - For hypotension that does not respond to initial fluid resuscitation, apply vasopressors to maintain a mean arterial pressure (MAP) > 65 mmHg.
        - In the event of persistent arterial hypotension despite volume resuscitation (septic shock) or initial lactate $\geq$ 4 mmol/L (36 mg/dL):
            - Measure central venous pressure (CVP).*
            - Measure central venous oxygen saturation (ScvO2).*
        - Remeasure lactate if initial lactate was elevated.*

* Targets for quantitative resuscitation included in the guidelines are CVP of $\geq$ 8 mm Hg, ScvO2 of $\geq$ 70%, and normalization of lactate.

Recommended Practice: Develop Policies and Procedures

- An organizationwide sepsis management protocol, policy, and/or procedures are necessary to integrate evidence-based guidelines into clinical practice.
- Convene a multidisciplinary team that includes different professions and service lines.[2]
- Incorporate the "Surviving Sepsis Campaign" evidence-based guidelines, including the 3-hour resuscitation and 6-hour care bundles, into the sepsis management protocol and/or procedures.[2]
- Develop a systemwide protocol. Institute the goal that all adult services use the same protocol, including the emergency and intensive care departments.
- Develop order sets, preferably electronic, for nonsevere sepsis and for severe sepsis/septic shock.

- Develop a systemwide antibiotic policy and/or procedure that includes type, dosing, initiation, timing, and compatibility.
- Use a process for screening patients for sepsis, such as a paper or electronic screening tool that is 1 page and will take 2-3 minutes to complete. Also consider use of the rapid-response team for screening.
- Incorporate a mechanism for handoff communication between the emergency department and intensive care unit.
- Implement a sepsis education program offered systemwide. Include didactic presentations and electronic offerings.

Recommended Practice: Adopt Sepsis Management Measures

- Organizational performance goals need to be determined. Use a retrospective chart review tool to identify baseline sepsis management compliance.
    - Evaluate compliance by using process measures such as door-to-antibiotic time; share reports regularly with stakeholders to communicate progress.
- Use a systemwide mechanism to share data with administrators, physicians and other providers, and staff, such as a sepsis management dashboard and/or reports.

Educational Recommendation

- Plan and provide education on protocols and standing orders to physician and other providers, nurses, and all other staff involved in sepsis prevention and care (emergency department, intensive care unit, etc). Education should occur upon hire, annually, and when this protocol is added to job responsibilities.[2]

Effectiveness of Action Items

- Track compliance with elements of established protocol steps.
- Evaluate effectiveness of new processes, determine gaps, modify processes as needed, and reimplement.
- Mandate that all personnel follow the sepsis protocol and develop a plan of action for staff in noncompliance.
- Provide feedback to all stakeholders (physicians and other providers, nursing, and ancillary staff; senior medical staff; and executive leadership) on level of compliance with process.[2]
- Monitor and evaluate performance regularly to sustain improvements achieved.[2]

Additional Resources

Systems/Processes

- Surviving Sepsis Campaign bundles
  http://www.survivingsepsis.org/bundles/Pages/default.aspx
- Surviving Sepsis Campaign implementation kit
  http://www.survivingsepsis.org/Improvement/Pages/Implementation-Kit.aspx.
- Surviving Sepsis Campaign educational materials
  http://www.survivingsepsis.org/Resources/Pages/Media.aspx

- AHRQ Innovations Exchange: Sepsis alert program leads to more timely diagnosis and treatment, reducing morbidity, mortality, and length of stay http://www.innovations.ahrq.gov/content.aspx?id=2264&tab=
- AHRQ Innovations Exchange: Nine-hospital collaborative uses patient screening criteria, fast-track diagnosis, and treatment protocols to reduce sepsis mortality by approximately 50 percent https://innovations.ahrq.gov/profiles/nine-hospital-collaborative-uses-patient-screening-criteria-fast-track-diagnosis-and

Policies/Protocols

- Stony Brook Medicine Severe Sepsis/Septic Shock Recognition and Treatment Protocols http://www.survivingsepsis.org/SiteCollectionDocuments/Protocols-Sepsis-Treatment-Stony-Brook.pdf

Tools

- Surviving Sepsis Campaign protocols and checklists http://www.survivingsepsis.org/Resources/Pages/Protocols-and-Checklists.aspx
- Surviving Sepsis Campaign data collection tools http://www.survivingsepsis.org/Data-Collection/Pages/default.aspx

Staff Required

- Emergency department staff
- Intensive care unit staff
- Ancillary staff (lab, respiratory, dietary, etc.)

Equipment

- Equipment for blood draws.
- Appropriate medications, including antibiotics and vasopressors.

Communication

- Communication of critical lactate and blood culture results to team in a timely manner.

Authority/Accountability

- Senior leadership mandating protocol for all providers.

References

1. Kleinpell RM, Munro CL, Giuliano KK. Chapter 42. Targeting health care-associated infections: evidence-based strategies. In: Hughes RG, ed. Patient safety and quality an evidence-based handbook for nurses.
2. Dellinger RP, Levy MM, Rhodes A, et al. Surviving Sepsis Campaign: international guidelines for management of severe sepsis shock: 2012. Crit Care Med 2013;41(2):580-637.
3. Lopez-Bushnell K, Demaray W, Jaco C. Reducing sepsis mortality. Medsurg Nurs 2014 Jan-Feb;23(1):9-14.

4. Hospital Inpatient Quality Reporting (IQR) Program measures (calendar year 2014 discharges). (Prepared by Telligen under contract to the Centers for Medicare & Medicaid Services.) http://qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic/Page/QnetTier3&cid=1138900298473. Accessed May 20, 2016.
5. Cardoso T, Carneiro AH, Ribeiro O, et al. Reducing mortality in severe sepsis with the implementation of a core 6-hour bundle: results from the Portuguese community-acquired sepsis study (SACiUCI study). Crit Care 2010;4(3):R83.
6. Wang Z, Xiong Y, Schorr C, et al. Impact of sepsis bundle strategy on outcomes of patients suffering from severe sepsis and septic shock in China. J Emerg Med 2013 Apr;44(4):735-41.
7. Evaluation for Severe Sepsis Screening Tool. Society of Critical Care Medicine Web site. http://www.survivingsepsis.org/SiteCollectionDocuments/ScreeningTool.pdf. Accessed May 20, 2016.