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The Centers for Disease Control and Prevention's Hospital Sepsis Program Core Elements

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Sepsis, a life-threatening syndrome of acute organ dysfunction secondary to infection, is a common cause of hospitalization and death. In the US, sepsis contributes to approximately 1.7 million adult hospitalizations and more than a third of all hospital deaths.¹ In addition to being deadly, sepsis also contributes to new and worsened morbidity. Patients experience heightened risk for further health deterioration, hospital readmission, and death in the months, and even years, after the acute resolution of sepsis.² In recognition of the large global burden of morbidity and mortality from sepsis, the World Health Assembly adopted a resolution in 2017 on improving the prevention, diagnosis, and management of sepsis, including survivors' access to rehabilitation.³

This month, the Centers for Disease Control and Prevention (CDC) has released the Hospital Sepsis Program Core Elements⁴ (from here, "Sepsis Core Elements") to assist hospitals with developing multi-professional programs to monitor and optimize management and outcomes of sepsis. The Sepsis Core Elements complement existing sepsis guidelines and facilitate implementation of best practices across a range of patient populations (adults, children, and people who are pregnant or postpartum) and in a range of hospital settings. The guidance does not provide a specific recipe for treating sepsis, but rather a "manager's guide" for developing a comprehensive program to monitor and improve outcomes from sepsis.

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The guidance conceptualizes sepsis performance improvement as a continual process and highlights the importance of using quality improvement tools and implementation science principles to drive ongoing improvement in sepsis management and outcomes.

The Sepsis Core Elements are inspired by the CDC's Core Elements of Hospital Antibiotic Stewardship Programs, which have catalyzed the development of antimicrobial stewardship programs and driven national improvements in antimicrobial prescribing and outcomes. The CDC has tracked achievement of the antibiotic stewardship core elements over time through the National Healthcare Safety Network annual survey, and the percentage of US hospitals achieving all 7 core elements has increased from 40.9% in 2014 to 94.9% in 2021.⁵ The CDC will also track uptake of the Sepsis Core Elements through the National Healthcare Safety Network annual survey.

Like antibiotic stewardship programs, hospital sepsis programs provide a comprehensive, multifaceted approach to improving outcomes. They do so by implementing structures and processes to support optimal, evidence-based clinical management; educating clinicians, patients, and families/caregivers; and tracking and reporting hospital-based treatment and outcomes. To perform these activities well, hospital sepsis programs require resources and support from hospital leadership, engagement of multiprofessional hospital staff, and defined program leadership. The 7 core elements of hospital sepsis programs are described in the Table: (1) hospital leadership commitment, (2) accountability, (3) multiprofessional expertise, (4) action, (5) tracking, (6) reporting, and (7) education. The Sepsis Core Elements provide guidance on achieving each of these elements, while also allowing for flexibility in sepsis program structure and focus.

The Sepsis Core Elements build on prior large-scale efforts to improve sepsis outcomes, such as the Surviving Sepsis Campaign, the New York state sepsis regulations, and the Centers for Medicare & Medicaid Services' Severe Sepsis/Septic Shock Early Management Bundle. These initiatives have focused on recognition and early management of sepsis in hospitals. While measuring the impact of such programs is notoriously difficult, the best available evidence suggests that these programs have improved sepsis outcomes.^{6,7} However, morbidity and mortality from sepsis remain unacceptably high, indicating more work is needed.

The Sepsis Core Elements reinforce and extend these prior initiatives in several important ways. First, the Sepsis Core Elements emphasize the importance of hospital leadership in directing that clinicians leading the program have the time, resources (including data analytics), and support structures needed to succeed. Second, the Sepsis Core Elements address all hospital-based sepsis activities—including education, tracking of sepsis management, and reporting of sepsis outcomes—while prior sepsis initiatives have focused on improving select processes of care. Third, the Sepsis Core Elements address management of sepsis throughout hospitalization, while prior initiatives have often focused on the first 6 to 24 hours of sepsis management, or the so-called golden hours of sepsis resuscitation. Early recognition and management are critical and are points of emphasis in the Sepsis Core Elements, but subsequent management is also important to optimizing longer-term recovery from sepsis and is an area for improvement.

The establishment of robust hospital sepsis programs, as laid out in the Sepsis Core Elements, will prepare hospitals for anticipated changes in sepsis policy and treatment in the coming decade. CMS has begun developing a 30-day mortality measure for community-onset sepsis that will leverage electronic health record data for both sepsis identification and risk adjustment.⁸ A sepsis program that effectively promotes best practices across the spectrum of sepsis care will be better prepared to succeed using such a measure. Further, the evidence and tools informing sepsis treatment are constantly evolving. As new literature is published, guideline recommendations are updated, and new drugs and diagnostics become available, hospitals with established, effective sepsis programs will be better equipped to incorporate these advances into clinical practice.

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REFERENCES

1. Rhee C, Dantes R, Epstein L, et al. ; CDC Prevention Epicenter Program. Incidence and trends of sepsis in US hospitals using clinical vs claims data, 2009–2014. *JAMA*. 2017;318(13):1241–1249. doi:10.1001/jama.2017.13836 [PubMed: 28903154]
2. Prescott HC, Angus DC. Enhancing recovery from sepsis: a review. *JAMA*. 2018;319(1):62–75. doi:10.1001/jama.2017.17687 [PubMed: 29297082]
3. Reinhart K, Daniels R, Kissoon N, Machado FR, Schachter RD, Finfer S. Recognizing sepsis as a global health priority: a WHO resolution. *N Engl J Med*. 2017;377(5):414–417. doi:10.1056/NEJMp1707170 [PubMed: 28658587]
4. Centers for Disease Control and Prevention. Hospital Sepsis Program Core Elements. Accessed August 24, 2023. <https://www.cdc.gov/sepsis/core-elements.html>
5. Centers for Disease Control and Prevention. Hospital antibiotic stewardship. Accessed July 14, 2023. <https://arpsp.cdc.gov/profile/stewardship>
6. Kahn JM, Davis BS, Yabes JG, et al. Association between state-mandated protocolized sepsis care and in-hospital mortality among adults with sepsis. *JAMA*. 2019;322(3):240–250. doi:10.1001/jama.2019.9021 [PubMed: 31310298]
7. Levy MM, Dellinger RP, Townsend SR, et al. The Surviving Sepsis Campaign: results of an international guideline-based performance improvement program targeting severe sepsis. *Intensive Care Med*. 2010;36(2):222–231. doi:10.1007/s00134-009-1738-3 [PubMed: 20069275]
8. Klompas M, Rhee C, Singer M. The importance of shifting sepsis quality measures from processes to outcomes. *JAMA*. 2023;329(7):535–536. doi:10.1001/jama.2023.0340 [PubMed: 36662507]

Table.

Core Elements of Hospital Sepsis Programs⁴

| Core element | Description |
|--------------------------------|---|
| Hospital leadership commitment | Support from hospital leadership to ensure that hospital sepsis efforts have the necessary human, financial, and information technology resources. |
| Accountability | Appointment of 1 leader or 2 co-leaders responsible for program goals and outcomes. |
| Multiprofessional expertise | Engagement of key partners throughout the hospital and health system to support sepsis measurement and quality improvement efforts. |
| Action | Implementation of structures and processes to improve the identification of, management of, and recovery from sepsis (eg, hospital guidelines, care pathways, screening protocols, and order sets). |
| Tracking | Measurement of hospital sepsis epidemiology, management, and outcomes to assess the impact of sepsis initiatives and progress toward program goals. |
| Reporting | Provision of data on sepsis management and outcomes to relevant partners. |
| Education | Education on sepsis for clinicians, patients, and family/caregivers. |