

Best Practices For Improving Sepsis Care and Outcomes

Coordinating Sepsis Care Across Your Hospital

The Human and Financial Costs of Sepsis Persist

Because sepsis remains one of the world's most effective killers, hospitals across the country continue their work to improve sepsis outcomes.



In 2017, sepsis accounted for **1 in 5 deaths** globally and was the most common cause of deaths in the hospital in the United States.¹



In absolute terms, **hospital admissions** for sepsis-related conditions outnumber admissions for stroke, acute myocardial infarction, and trauma combined.¹



Septic shock alone carries a **34 percent mortality rate**.²



The financial cost to U.S. health care is estimated at a staggering **33 billion dollars** per year and rising.¹



Medicare data indicates the average cost per hospitalized patient ranges from about **\$22,000 to over \$70,000 for sepsis** present on admission and hospital acquired sepsis, respectively, making it the most expensive disease state in hospitals.³

This guide offers best practices Wolters Kluwer has gleaned from working with hospitals across the country who are dedicated to improving sepsis performance and patient outcomes at their facilities.

Hospitals' Five Most Significant Sepsis Challenges

Many busy hospitals or hospital systems wrestle with exactly where and how to focus sepsis improvement efforts. The extreme and necessary focus on the COVID-19 pandemic has only exacerbated the challenge by forcing many sepsis coordinators into reactive mode.

In contrast, an integrated strategy to address the five most critical challenges can yield substantive and measurable progress. The five challenges are:



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Monitoring known sepsis patients in-real time



Gaining access to early and actionable insights for at-risk patients



Identifying the most promising hospital areas for sepsis care improvements



Standardizing sepsis protocols and procedures



Reliably measuring sepsis performance

Achieve Real-Time Sepsis Surveillance

Central monitoring of all known sepsis patients facilitates early intervention to achieve improved outcomes. Rather than having to weave through all the noise from EHR alerts, sepsis coordinators can use central monitoring to focus specifically on sepsis in ways that reinforce hospital care models and sepsis protocols.

Best in class electronic surveillance solutions:

- display a comprehensive view of all sepsis patients and clearly indicate the current status in the sepsis bundle.
- deliver accurate alerts within your hospital's clinical workflow to the appropriate staff, **only when teams are not providing sepsis care or are at risk of missing a SEP-1 bundle step**, thus appropriately preventing alert fatigue.

This centralized delivery of early, highly accurate, patient-specific alerts enables care teams to proactively identify potential problems before they occur or shortly after. And when the right person receives alerts at the right time, your team can consistently deliver evidence-based care to improve patient outcomes and reduce costs.

Some private insurers have begun requiring bundles rooted in SEP-3 definitions.

SEP-1

- SIRS: a combination of abnormal body temperature, rapid heart rate, tachypnea, and a low white blood cell count
- Two SIRS elements + infection
- Most widely used measure for detection; highly sensitive, less specific (can lead to false positives)

SEP-3

- SOFA: 6 scores, one each for the respiratory, cardiovascular, hepatic, coagulation, renal and neurological systems
- Increase in a SOFA score of two points or more
- Sepsis 3 is considerably more specific than Sepsis 1, but it is not nearly as sensitive so can miss cases of sepsis

[Learn more about current sepsis guidelines.](#)

Identify the Most Promising Areas for Sepsis Improvement

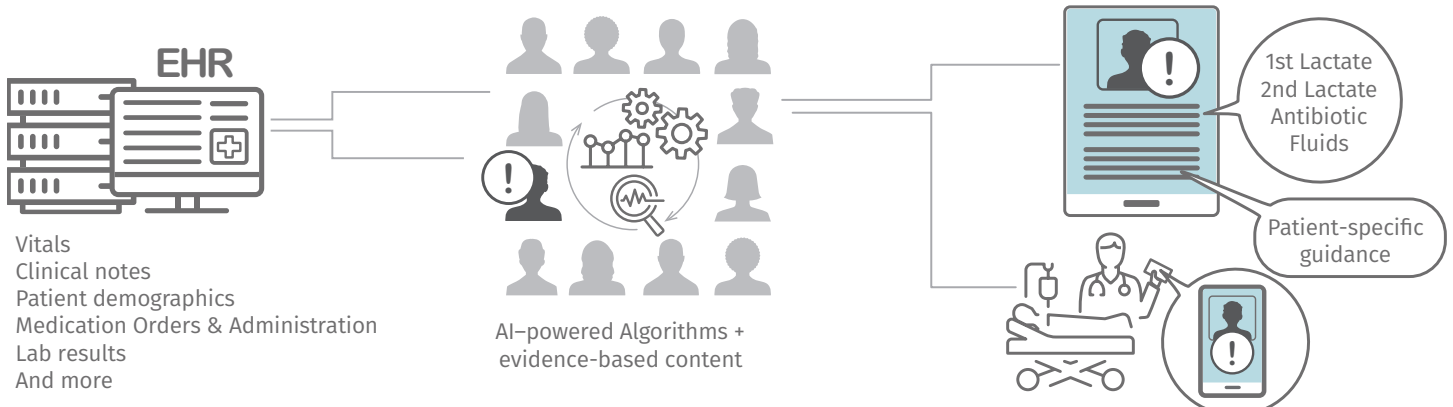
While the incidence of sepsis is much higher in the intensive care unit and the emergency department (ED) than in other parts of the hospital, most hospitals have already implemented effective sepsis detection and treatment programs in these departments. While it is always important to find ways to continuously improve in these areas, they are unlikely to yield major improvements in morbidity and mortality. That's why in many cases it is far more effective to focus on two patient populations often left out of sepsis improvement programs.

Identify At-Risk Patients Early

An important next step is implementing technology that enables early identification of patients at risk for sepsis. Early identification has, of course, long been a challenge because most existing surveillance solutions, including EHRs, rely primarily on SIRS criteria and other quantitative elements of the EHR. Surveillance, therefore, tends to be extremely sensitive, catching nearly all potential sepsis cases, but with low specificity, leading to disturbing numbers of false alerts, which clinicians too often ignore out of understandable frustration.

Numerous studies have shown that as the false positive rate approaches 1 in 3, clinicians will turn a deaf ear to them.

In contrast, a well-crafted advanced surveillance system deploys validated artificial intelligence (AI) with natural language processing (NLP) to dramatically improve alert accuracy. This enables earlier identification of clinical concerns and engenders trust with clinical teams that leads to more consistency around treatment protocols.



Emergency Department Transitions

Patients whose ED course is complete and who have technically been admitted to a ward bed, but are “boarding” in the ED while awaiting the bed represent about one-third of the cases that present in the ED. When these patients develop sepsis while waiting for a bed, it's not uncommon for them to crash within six hours, with their diagnosis and treatment often delayed, due to thinly stretched resources and the failure to screen patients for sepsis during this transitional period.

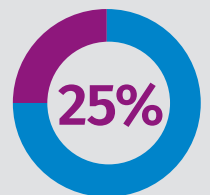


Patients awaiting a bed represent one-third of sepsis cases that present in the ED.

Medical-Surgical Wards

The other area traditionally underserved by sepsis improvement programs is the inpatient medical-surgical ward, which accounts for roughly 25 percent of hospital-developed sepsis. Studies have shown that in these wards, sepsis goes undetected for longer periods of time and, once detected, is not always treated with a timely and/or appropriate intervention. This is partly because medical-surgical units do not typically have the staffing for intensive involvement with a single patient and may not have had adequate training in sepsis awareness and protocols.

Inpatient medical-surgical ward accounts for 25 % of hospital-developed sepsis.



Such systems work by using NLP to parse through unstructured clinical notes and using clinician-informed algorithms to appropriately ignore confounding co-morbidities, conditions, and even medications that can mimic SIRS and early sepsis. By monitoring and evaluating patients as clinicians do every day – but doing so on an ongoing basis for every relevant hospital patient – these systems achieve coverage that far exceeds human capacity. Early case studies have demonstrated that without any loss in sensitivity, such systems can be highly specific and therefore dramatically reduce false alerts. Moreover, a study published in 2020 in the *Journal of Patient Safety* reviewed six studies that provided evidence of patient monitoring systems reducing sepsis-related mortality; in one study, the risk of death was nearly 50 percent lower.⁴

Effectively and Comprehensively Implement Evidence-Based Sepsis Protocols

Implementing effective surveillance must go hand-in-hand with implementing evidence-based sepsis protocols, because patients who receive sepsis bundle care have better outcomes.

According to a 2019 New York State study⁵, patients treated according to CMS 3- and 6- hour bundles:



Were **15% less likely to die** than those patients whose care did not follow protocols.



Experienced decreased sepsis mortality rates by **4.3% in New York** and **2.9% in four control states**.



Had a length of stay that was **nearly three days shorter with the 3-hour bundle** and **more than a day shorter with the 6-hour bundle**.



While most hospitals have sepsis protocols that focus on the initial admission of patients with sepsis who present to the emergency department, a truly effective program plans “mini” order sets for patients already admitted for a specific condition but who go on to develop sepsis. The best programs go further still and flesh out each step down to such items as:

- Who should be alerted first
- Which “mini” order set should be used when
- Who can order the set
- When to call the rapid response team

Equally important, as noted above, an electronic alert-based system must engender clinician trust through transparency about the origin of the alerts, demonstrated sensitivity and specificity, and the delivery of explicit, patient-specific, evidence-based, actionable care guidance to the care team. Where appropriate, such alerts might embed facility-specific policies and protocols to further promote adherence and reduce variations in care among your clinical staff.



Perhaps most importantly, reducing care variation and its accompanying costs in dollars and human suffering demands effective engagement of your clinical staff in change management. The keys to such engagement are:

- 1. Early involvement:** From the outset, clinicians must be part of the planning and technology selection, along with sepsis committees, sepsis teams and management.
- 2. Nurse empowerment:** Numerous studies have shown the benefits of nurse-led sepsis screening interventions, as well as nurses being given the authority and ability to generate orders that jumpstart treatment.
- 3. Improved communication:** Reduce the common cultural barriers to communication between the bedside nurse and physician. With so many teams involved – including the sepsis coordinator, charge nurse, rapid response team and physicians – it is imperative that everyone is on the same page.

Accurately Measure Sepsis Performance

Measuring sepsis performance provides objective insight that helps your hospital optimize and improve sepsis performance while also complying with government regulations that require frequent public sharing of key performance metrics.

Reports should reflect areas you need to address and be aligned with larger overarching organizational goals. Focus on areas such as sepsis bundle compliance and patient outcomes impacted by alert performance and clinician response.

More generally, sepsis coordinators and other key stakeholders should be able to access and generate any reports they need without having to rely on outside teams or efforts to develop reports. Coordinators should review sepsis performance on a regular basis to guide continuous improvement.

Getting Started


To begin the process of optimizing your sepsis improvement program during this extremely busy time:

- Conduct a baseline assessment to identify pain points and current gaps in your sepsis program.
- Set up a cross-functional team to:
 - Develop a plan for standardizing protocols.
 - Assess technology and processes that can optimize the program.
 - Audit the available reporting to identify gaps, develop an action plan for more automated reporting, and ensure teams can seamlessly generate and analyze reports they need.
 - Design education and training for any staff involved in sepsis prevention and treatment. The Sepsis Alliance and Serving Sepsis Campaign both offer robust materials to support such efforts.



A Better Way: POC Advisor™

The only sepsis surveillance solution with scientifically calculated and published results, POC Advisor has achieved outcomes unmatched in the industry. A 2016 study in the journal of the American Medical Informatics Association (JAMIA)^[17] found:

-  **Mortality decreases of more than 53%**
-  **30-day readmission declines by nearly 31%**
-  **Reduced lengths of stay**

POC Advisor delivers proven improvements in key sepsis performance metrics by detecting the condition six to eight hours before patients develop organ dysfunction, a commonly used sepsis definition for EHR-based surveillance. Every hour sepsis goes undetected means an increase in mortality and cost. Real-time identification of patients with sepsis and providing clinicians with evidence-based guidance is crucial to reduce variation in care and to improve financial and clinical outcomes.

Author



Itay Klaz, MD, MHCI

Dr. Itay Klaz is responsible for directing clinical efforts toward the development, implementation and support of Wolters Kluwer suite of surveillance software solutions. Dr. Klaz is a clinical informatician, dermatologist and a former military surgeon. He has specialized in the convergence of enterprise-level electronic health records, EHR interoperability, health care data science, clinical governance, patient outreach, risk and value-based care models and provider engagement.

Dr. Klaz earned his doctor of medicine and bachelor of science degrees from the Hebrew University of Jerusalem, Israel and his master of health care informatics from the University of San Diego. He has served in various leadership positions as CMIO, SVP of clinical informatics and medical director of HIT.

SoleSource_info@wolterskluwer.com | 800.654.8395

Learn more at www.wolterskluwer.com/en/solutions/solesource/poc-advisor

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