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### Authors

Dhaliwal, Gurpreet

Goglin, Sarah

Sofair, Andre N

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# Teaching to the Test: Threading the Needle on Sepsis Quality Metrics



Josué Zapata, MD, MBA<sup>1,2</sup> , and Gurpreet Dhaliwal, MD<sup>1,2</sup>

<sup>1</sup>Medical Service, San Francisco VA Medical Center, San Francisco, CA, USA; <sup>2</sup>Department of Medicine, University of California, San Francisco, CA, USA

## ABSTRACT

As quality metrics become more tightly linked to reimbursement and reputation, medical educators face the growing challenge of teaching clinical medicine in the context of policy-driven mandates. The Centers for Medicare and Medicaid Services sepsis bundle (SEP-1) requires physicians to execute time-bound interventions with little flexibility, while clinicians' professional duty compels them to individualize care based on evidence, comorbidities, and evolving best practices. This perspective explores how educators can prepare trainees to recognize when clinical actions are grounded in evidence-based practice, professional judgment, or the demands of a protocol. Teachers should become skilled at narrating the moments when clinical care and compliance overlap, diverge, or conflict. Post hoc reflection plays a critical role in consolidating these lessons, allowing trainees to explore trade-offs and question assumptions. Medical educators must guide learners through today's system while preparing them to shape it tomorrow.

**KEY WORDS:** competencies; graduate medical education; organizational behavior; pay for performance

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*An internal medicine resident is presenting a patient with urosepsis to their attending. The resident reports that the patient received 2 L of intravenous saline followed by the resolution of hypotension. On hearing the leading diagnosis ("urosepsis"), the attending does quick mental math based on the listed weight (75 kg  $\times$  30 mL/kg = 2250 mL). Noticing 7 min left before three hours in the emergency department has elapsed, the attending interrupts the resident and says, "Could you take a pause here and enter an order for a 250 cc fluid bolus right now?" The resident acquiesces but wonders what the medical significance and urgency of a tiny amount of saline could be, and whether this is an*

*opportunity for learning or simply the execution of a checklist obligation.*

## INTRODUCTION

The practice of medicine has evolved as our understanding of disease mechanisms and health systems has expanded. The best teachers grow with changes in medical practice and training paradigms to meet the needs of their trainees and patients.<sup>1,2</sup> The recently enacted federal sepsis bundle provides a concrete example of how administrative matters have compelled educators to adapt. In this article, we address the challenges medical educators face as the economic realities of the healthcare system create new operational competencies that must be taught alongside the technical aspects of patient care, even when these imperatives clash.

## The SEP-1 Sepsis Bundle

The Severe Sepsis and Septic Shock Early Management Bundle ("SEP-1") is a federally mandated quality measure built around a prespecified set of interventions, including blood cultures, antibiotics, lactate measurements, and intravenous fluid dosages that must be enacted under a strict timeline after severe sepsis or septic shock has been established.<sup>3</sup> Hospitals must adhere to every element of the protocol to receive credit, though there are allowances for exclusions if the reasoning is documented (e.g., "fluid goal not met because of decompensated heart failure").

SEP-1 was originally introduced as a Centers for Medicare & Medicaid Services (CMS) quality metric in 2015, though it has been the subject of increasing focus over the last several years as SEP-1 transitioned from a pay-for-reporting to a pay-for-performance measure in fiscal year 2026.<sup>4,5</sup> This means that more than 3000 hospitals participating in the CMS Hospital Value-Based Purchasing (HVBP) Program now face financial rewards and penalties tied to SEP-1 performance,<sup>6</sup> with quality scores affecting millions of dollars in CMS payments for larger institutions.<sup>7</sup> Because distinctions between sepsis, severe sepsis, and septic shock are difficult to make in real time and rely on technical definitions, clinicians and health systems often apply the full SEP-1 protocol to any patient in whom sepsis is a consideration, rather than risk noncompliance.

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The premise of the HVBP in general, and the SEP-1 bundle in particular, is to standardize care to reduce morbidity and mortality. Researchers have questioned the asserted benefit of SEP-1, citing real-world studies that challenge its impact on mortality in undifferentiated sepsis presentations.<sup>8–11</sup> Nonetheless, the compliance-reimbursement link has been forged and is the reality for hospitals, and therefore their residents and teachers.

### What's Different with SEP-1?

SEP-1 resembles externally imposed financial considerations that educators have long incorporated into their teaching. Teaching documentation requirements to support billing is a well-established practice of medical educators and a tacit acknowledgement of the realities of insurance reimbursement.<sup>12</sup> Teaching high-value care, where costs are explicitly considered when selecting tests or treatments, also requires educators to add financial implications to their conversations with trainees.<sup>13,14</sup>

SEP-1 differs from those imperatives by rigidly coupling time-sensitive clinical actions to financial and reputational outcomes for the institution. It is more complex than predecessor quality metrics and its measurement is substantially more burdensome.<sup>15–18</sup> SEP-1 therefore compels extra work such as explaining counterintuitive clinical actions (e.g., the additional 250 cc fluid bolus ordered in the vignette) or documenting the rationale for mundane matters (e.g., why a second lactate level was not measured) in the medical record. Finally, the subject of the measurement – sepsis – is heterogeneous, complex, and contested.<sup>19,20</sup>

As sepsis definitions and best practices evolve, SEP-1's fixed requirements, developed in 2015, can conflict with current evidence (e.g., recommendations to avoid blood cultures in non-severe pneumonia),<sup>21,22</sup> complicating efforts to simultaneously teach evidence-based medicine and compliance with mandated protocols. SEP-1 creates the challenge of teaching clinical science alongside health systems science without giving short shrift to either.

### Teaching to the Test

Medical educators can prepare learners to contend with contemporary practice through intentional conversational strategies that make decisions, trade-offs, and the extra work explicit. Text Box 1 illustrates a teaching moment in which the educator narrates the alignment and conflict between clinical reasoning, evidence-based care, and the SEP-1 protocol.

These real-time conversation strategies can be reinforced through later reflection that helps the trainee connect to

broader professional responsibilities. One approach is to tie the SEP-1 aligned actions to a larger goal that transcends one patient. For instance, an educator may share that “Our ICU’s funding last year was contingent on how we performed on these few CMS metrics. Your patient might not need the ICU now, but another patient will in six months.” This type of framing helps learners appreciate the responsibility they hold not just for today’s patient, but for patients who come through the doors long after their training has concluded.

Another way to integrate SEP-1 into decision-making is to position metrics as instruments for quality improvement rather than compliance. For example, an attending may point out to a resident how benchmarking can improve the quality of care. “Our hospital used to have an above-average readmission rate for patients with heart failure. Only by tracking data did we realize that we were falling short on prescribing goal directed therapy before discharge. I also recognized that as a shortcoming in my practice with patients with heart failure.” These conversations can reframe metrics from checkboxes for money to drivers of improved clinical practice.

Naming a metric’s flaws while clarifying its purpose helps learners understand how physicians balance skepticism and humility with imperfect mandates. Faculty can illustrate this by sharing a story in which a sepsis alert prompted blood cultures which seemed excessive at the time but later returned positive and influenced care. Conversely, an attending can share a case in which weight-based fluid resuscitation, a contested practice with limited supporting evidence, caused harm.<sup>23</sup> Inviting discussion around “Where does SEP-1 fail, and where does it help?” encourages thinking in terms of trade-offs rather than absolutes. Such dialectical thinking can support better decision-making in other clinical contexts.

### CONCLUSION

When trainees perceive pressure to prioritize institutional objectives over patient care, skepticism and confusion may arise. To foster professional engagement with complex quality metrics, educators should candidly acknowledge their limitations while also articulating their utility to patients, clinicians, and institutions. The objective of this stance is not uncritical adherence, but thoughtful demonstration of how to maintain clinical judgment and professional integrity while working in an imperfect system.

## Text Box 1

**A teaching moment where the educator narrates the alignment and conflict between clinical reasoning, evidence-based care, and the requirements of the SEP-1 bundle in a case of severe sepsis.**

A 92-year-old man presents with lethargy, cough, and dyspnea. There is no dysuria, abdominal pain, or flank pain. Temperature is 38.4 °C, heart rate is 108 beats per minute, blood pressure is 88/58 mmHg, and oxygen saturation is 94% on room air. He is euvolemic and the lung sounds are normal. The patient weighs 63 kg. He has a history of heart failure (ejection fraction 25%), stage 3 chronic kidney disease, chronic urinary obstruction (managed with an indwelling urinary catheter), *Pseudomonas* urinary tract infection, and recent *Clostridioides difficile* colitis.

White blood cell count is 11,300 per microliter, serum lactate 2.2 mmol per liter, and urinalysis shows 50 white blood cells per high-power field. A respiratory viral panel polymerase chain reaction test is positive for influenza A. Chest x-ray shows stable cardiomegaly without opacities or effusions.

The electronic medical record issues a sepsis alert (establishing “time zero”) based on (1) documented/suspected infection, (2) two systemic inflammatory response syndrome criteria (temperature and heart rate), and (3) organ dysfunction (lethargy and elevated lactate).

In the first hour, he receives 1 L of normal saline and acetaminophen. After 90 min, the temperature is 37.7 °C, heart rate is 82 beats per minute, blood pressure is 118/78 mmHg, and the patient is more alert; no antibiotics have been administered.

The attending discusses their rationale for testing and treatment with the resident.

| SEP-1 requirements                                                                                                                                                     | Clinical judgment                                                                                                                                                                                                                                                       | Degree of alignment between SEP-1 and clinical judgment | Attending physician explaining the joint rationale to the trainee (“threading the needle”)                                                                                                                                                                                                                                                                         | Extra work generated by SEP-1                                                                                                                                                                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Two sets of blood cultures drawn within 3 h of time zero (and before giving the first dose of IV antibiotics)                                                          | Blood cultures before antibiotics is standard practice.                                                                                                                                                                                                                 | Complete                                                | “If this is urosepsis, we obtain blood and urine cultures in the hopes that we can target therapy later.”                                                                                                                                                                                                                                                          | None                                                                                                                                                                                                                                   |
| Administer broad-spectrum intravenous antibiotics within 3 h of time zero                                                                                              | Cough, dyspnea, and rapid improvement without antibiotics support influenza as the likely diagnosis. Pyuria may represent a chronic finding rather than acute infection, and reflexive antibiotics carry the risk of recurrent <i>Clostridioides difficile</i> colitis. | Partial                                                 | “This is most likely influenza, and we will treat accordingly, but I’m on the fence about giving antibiotics for a UTI. I think we could watch him for a few hours before making that call, and it would be great to spare him the risk of recurrent C diff. However, I’m also influenced by the sepsis protocol requirement to give antibiotics in a 3-h window.” | Make sure timestamp of severe sepsis determination is noted in the chart.                                                                                                                                                              |
| Serum lactate level must be measured within 3 h of time zero                                                                                                           | Lactate has limited prognostic value.                                                                                                                                                                                                                                   | Partial                                                 | “Lactate doesn’t change our management, but it fulfills the sepsis metric.”                                                                                                                                                                                                                                                                                        | None                                                                                                                                                                                                                                   |
| If the initial lactate is > 2.0 mmol/L, a repeat lactate measurement is required within 6 h of time zero                                                               | Evidence does not support using lactate changes to guide therapy. <sup>24–27</sup>                                                                                                                                                                                      | Conflict                                                | “A second lactate doesn’t have utility given how quickly he improved, but the sepsis metric requires it. Since he’s on the floor, please call the admitting team, let them know we need it for metrics purposes, and document that we ordered it.”                                                                                                                 | Admitting physician contacts inpatient team to measure lactate #2. Ward nurse or inpatient physician must explain to the patient and family the rationale for an extra blood draw at 2am when patient was feeling better and sleeping. |
| Administer 30 mL/kg of crystalloid IV fluids within 3 h of time zero for patients with an initial lactate ≥ 4.0 mmol/L or hypotension (SBP < 90 mmHg or MAP < 65 mmHg) | One liter of IVF has rendered him euvolemic; there is no rationale for more IVF, which poses a risk of hypervolemia given his severe CHF and advanced CKD.                                                                                                              | Partial                                                 | “His hemodynamics improved with the first liter of fluid. We are giving less than 30 cc/kg because of the risk of precipitating CHF. You should document that rationale so that we don’t get penalized on sepsis auditing.”                                                                                                                                        | Resident must document why 30 cc/kg (1.9L) of IVF was not administered. Resident must explain to bedside nurse, who is also well versed in sepsis protocol, why stipulated fluid amount is not being administered.                     |

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**Corresponding Author:** Josué Zapata, MD, MBA; Medical Service, San Francisco VA Medical Center, San Francisco, CA, USA (e-mail: Josue.Zapata@ucsf.edu).

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