Preliminary Performance on the New CMS Sepsis-1 National Quality Measure: Early Insights From the Emergency Quality Network (E-QUAL)

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Study objective: We describe current hospital-level performance for the Centers for Medicare & Medicaid Services' Severe Sepsis/Septic Shock Early Management Bundle (SEP-1) quality measure and qualitatively assess emergency department (ED) sepsis quality improvement best practice implementation.

Methods: Using a standardized Web-based submission portal, we surveyed quality improvement data from volunteer hospital-based EDs participating in the Emergency Quality Network Sepsis Initiative. Each hospital submitted preliminary SEP-1 local chart review data, using existing Centers for Medicare & Medicaid Services definitions. We report descriptive statistics of SEP-1 data availability and performance. The primary outcome for this study was SEP-1 bundle compliance, defined as the proportion of all severe sepsis and septic shock cases receiving all required bundle elements, and secondary outcomes included conditional compliance on reported SEP-1 numerator components and ED implementation of sepsis quality improvement best practices.

Results: A total of 50 EDs participated in the survey; 74% were nonteaching sites and 26% were affiliated with academic centers. Of all participating EDs, 80% were in regions with relatively high population density. The mean hospital SEP-1 bundle compliance was 54% (interquartile range 30% to 75%). Bundle compliance improved during fiscal year 2016 from 39% to 57%. Broad variation existed for each bundle component, with intravenous fluid resuscitation and repeated lactate bundle elements having the widest variation and largest gaps in quality. At least one consensus sepsis quality improvement best practice implementation occurred in 92% of participating sites.

Conclusion: Preliminary data on SEP-1 performance suggest wide hospital-level variation in performance, with modest improvement during the first year of data collection. [Ann Emerg Med. 2017;■:1-6.]

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INTRODUCTION

Background and Importance

Sepsis affects more than 1.6 million hospitalized patients and results in more than 250,000 deaths every year in the United States.[1] The emergency department (ED) serves as a primary site of initial identification and treatment of most sepsis patients and plays a central role in clinical trials and quality improvement efforts to improve sepsis outcomes.[2] In October 2015, the Centers for Medicare & Medicaid Services (CMS) began collecting the first national quality measure of sepsis care for public reporting, the Severe Sepsis/Septic Shock Early Management Bundle, commonly referred to as SEP-1.[3] This measure triggered substantial debate during its first evaluation as part of the National Quality Forum measure endorsement process and was ultimately approved after the publication of several large sepsis clinical trials prompted measure reevaluation and revision.[4-7] CMS later modified the measure specifications to operationalize its content for public reporting nationally, which again generated extensive discussion in regard to the validity and the burden of quality reporting. Since implementation, little has been discovered about achievement of SEP-1 benchmarks or variation in national performance to guide ED and hospital leaders or policymakers.

In October 2015, the American College of Emergency Physicians (ACEP) launched the Emergency Quality Network (E-QUAL) Sepsis Initiative as part of the CMS Transforming Clinical Practice Initiative, seeking to improve patient outcomes by enrolling EDs across the nation in a learning collaborative to improve the early

Editor's Capsule Summary

What is already known on this topic

The Centers for Medicare & Medicaid Services is collecting a new quality measure for public reporting, the Severe Sepsis/Septic Shock Early Management Bundle (SEP-1). Little is known about current performance to guide emergency departments (EDs) and policymakers.

What question this study addressed

Fifty EDs in an American College of Emergency Physicians–sponsored network reported performance for SEP-1 and assessed sepsis quality improvement practices.

What this study adds to our knowledge

Mean SEP-1 bundle compliance was 54% and improved from 39% to 57% during 2016. Large variation existed for each bundle component, especially intravenous fluid resuscitation and repeated lactate measurement.

How this is relevant to clinical practice

EDs and policymakers now have baseline information to assess SEP-1 performance, demonstrating large variability among EDs.

identification, treatment, and reassessment of sepsis.[8] As part of E-QUAL, the focused SEP-1 Benchmarking Challenge gathered sepsis quality data to provide early and real-time performance feedback at a national level.

Goals of This Investigation

We sought to describe the current hospital-level performance for CMS SEP-1, and we sought to qualitatively assess perceived best practices deployed by participants.

MATERIALS AND METHODS

Study Design and Setting

We surveyed quality improvement data from hospital-based EDs participating in the E-QUAL Sepsis Initiative. We administered the survey during an 8-week period between October and December 2016 to collect hospital data in regard to SEP-1 during the previous, and first, year of national data collection (October 1, 2015, through September 30, 2016). This quality improvement study did not include patient-level information and was not considered human subjects research.

Selection of Participants

In October 2016, we invited leaders from hospital-based EDs that indicated an interest in sepsis quality improvement to participate in the SEP-1 Benchmarking Challenge as an optional, complementary data benchmarking exercise of the E-QUAL Sepsis Initiative. EDs self-select to participate in the E-QUAL Sepsis Initiative and represent primarily community EDs already engaged in or seeking to start a local sepsis quality improvement program. Although invitations were sent only to the limited number of EDs enrolled in E-QUAL, participation was permitted for any ED in the United States interested in sepsis quality improvement that was aware of the SEP-1 Benchmarking Challenge and requested an invitation for inclusion. A total of 81% of SEP-1 Benchmarking Challenge participating EDs were also enrolled in the E-QUAL Sepsis Initiative.

Methods of Measurement

We collected data with a standardized Web-based submission portal. Demographic data included annual ED visit volume, hospital zip code, and hospital type (choosing among academic/emergency medicine residency, academic/no emergency medicine residency, community, or community–critical access/rural). We classified each ED as rural or urban according to zip code metropolitan statistical area. We requested each ED to submit all preliminary data available on SEP-1 generated by hospital quality departments. These data are commonly abstracted by employed or contracted hospital quality improvement staff and subsequently shared with ED leadership for data validation and feedback.

Each hospital submitted preliminary SEP-1 data obtained from local chart review consistent with existing CMS definitions.[9] Hospital personnel did not resample, rereview, or recalculate results for this study. Data included the total number of cases reviewed, total number excluded, and counts of severe sepsis and septic shock cases during the data collection period (denominator) and the counts of cases in which sepsis bundle compliance was achieved (numerator). Consistent with the CMS SEP-1 measure specifications, all data elements were collected at the hospital level, whether the bundle element was delivered in the ED or not. Consistent with CMS guidance, hospitals without sufficient monthly sepsis case counts could submit data quarterly. There were no missing data for primary outcome assessment including total cases reviewed, total cases excluded, the bundle numerator, and bundle denominator. Following CMS skip logic, we also collected SEP-1 numerator components specific to emergency care, including initial and repeated blood lactate testing,