1.14a Numerator Details*

The measure is a series of attestations on overall program practices to improve the recognition and care of patients with sepsis. The information necessary to calculate the Hospital Sepsis Program Core Elements Score comes from required questions on the NHSN Patient Safety Annual Hospital Survey.

The numerator is the sum of priority examples (or domains) that hospital sepsis programs have in place.

The total score possible is 28 (total number of domains).

Core Element	Number of Domains/Points Possible
Hospital Leadership Commitment	5
Accountability	5
Multi-professional expertise	4
Action	5
Tracking	5
Reporting	1
Education	3
Total	**28**

The facility can receive one point per domain, based on their response(s) to the corresponding NHSN Patient Safety Annual Survey question or questions. Some domains require a "yes" to a single question, while others require selection of a combination of multi-select options to one or more questions. The NHSN Patient Safety Annual Survey can be found here https://www.cdc.gov/nhsn/forms/57.103_pshospsurv_blank.pdf.

This table explains the response(s) required for a facility to receive the point for each domain:

Domain	Priority Example	2024 NHSN Annual Survey Question(s)
Hospital Leadership Commitment - 1	1. Our sepsis program leader(s) are given sufficient specified time to manage the hospital sepsis program	Q54 c,d,e: **EITHER** APP, nurse, **OR** physician with non-0% effort (**EITHER** 1-10%, 11-25%, 26-50%, **OR** More than 50%). -**AND**- Q55. "Providing sepsis program leaders with sufficient specified time to manage the hospital sepsis program"
Hospital Leadership Commitment - 2	2. Our sepsis program is provided sufficient resources, including data analytics and information technology support, to operate the program effectively	Q55. "Providing sufficient resources, including data analytics and information technology support, to operate the program effectively."
Hospital Leadership Commitment - 3	3. Relevant staff from key clinical groups and support departments in our hospital have sufficient time to contribute to sepsis activities.	Q55. "Ensuring that relevant staff from key clinical groups and support departments have sufficient time to contribute to sepsis activities."
Hospital Leadership Commitment - 4	4. Our hospital has a senior leader (e.g., Chief Clinical Officer, Chief Medical Officer, of Chief Nursing Officer) who serves as an executive sponsor for the sepsis program.	Q55. "Appointing a senior leader to serve as an executive sponsor for the sepsis program."
Hospital Leadership Commitment - 5	5. Sepsis has been identified as a hospital priority by hospital leadership and this priority has been communicated to hospital staff.	Q55. "Identifying sepsis as a facility priority and communicating this priority to hospital staff."
Accountability - 1	14. Our hospital has a program or committee charged with monitoring/improving outcomes.	Q53. "yes"
Accountability - 2	15. Our hospital has one leader or two co-leaders responsible for sepsis program or committee management and outcomes.	Q54. "yes"
Accountability - 3	16. Our hospital sets ambitious but achievable goals at regular intervals and updates goals periodically to promote continuous improvement	Q53a. "Setting annual goals for sepsis management and/or outcomes"
Accountability - 4	17. Our hospital assesses progress towards hospital sepsis goals at regular intervals and updates goals periodically (e.g., annually) to promote continual improvement.	**BOTH** Q62. "Progress towards achieving hospital goals for sepsis treatment and/or outcomes", **AND** Q53a. "Setting annual goals for sepsis management and/or outcomes"
Accountability - 5	18. Our hospital has one physician and one nurse lead or champion to ensure physician and nursing engagement in the sepsis program.	Q54a: **BOTH** "Nurse" **AND** "Physician" are selected (at a minimum).
Multi-professional expertise - 1	22. Our hospital has a sepsis coordinator, who oversees day-to-day implementation of sepsis program activities.	Q55. - Facility leadership has demonstrated commitment to improving sepsis care by: "Having a sepsis coordinator who oversees day-to-day implementation of sepsis program activities"
Multi-professional expertise - 2	23. Clinicians and leaders from the emergency department, inpatient wards, and intensive care units are fully engaged in our hospital sepsis program activities.	Q53c. "Critical Care/Intensive Care (excluding Neonatal Intensive Care)" selected if hospital has indicated ≥10 ICU beds (from page 1 of the survey).
Multi-professional expertise - 3	24. Our hospital sepsis program includes diverse multi-disciplinary representation (e.g., antimicrobial stewardship, critical care, emergency medicine, hospital medicine, infectious diseases, nursing, other primary services [e.g., surgery, oncology, obstetrics, pediatrics], pharmacy, and social work).	**BOTH** Q53b. ≥4 options selected **AND** 53c. ≥4 options selected

Multi-professional expertise - 4	25. Our hospital sepsis program has ongoing support from individuals with expertise and formal training in data management and analytics, information technology, and quality improvement and patient safety.	Q53c. **BOTH** “Data Analytics” **AND** “Information Technology” selected.
Action - 1	27. Our hospital has implemented a standard process to screen for sepsis on presentation and throughout hospitalization.	**BOTH** Q56 "Our facility uses the following approaches to assist in the rapid identification of patients with sepsis upon presentation to the facility" **AND** Q57 "Our facility uses the following approaches to assist in identification of sepsis throughout hospitalization"
Action - 2	28. Our hospital has a hospital guideline or a standardized care pathway for management of sepsis that addresses	Q58. “Hospital guideline or care pathway for management of sepsis”
Action - 3	29. Our hospital has order sets for the management of sepsis tailored to the patient populations served.	Q58. “Hospital order set for management of sepsis"
Action - 4	30. Our hospital has structures and processes in place to facilitate prompt delivery of antimicrobials.	Q59. ≥2 options selected (**EXCEPT** "None of the above").
Action - 5	31. Our hospital has structures and processes in place to support effective hand-offs of patients with sepsis, such as templated notes to document sepsis diagnosis and treatment information.	Q58. **EITHER** “Structured template for documentation of sepsis treatment” **OR** “Standardized process for verbal hand-off of sepsis treatment”
Tracking - 1	37. Our hospital monitors hospital sepsis epidemiology, such as number of hospitalizations with community-onset sepsis, hospital-onset sepsis and septic shock.	Q62. “Hospital sepsis epidemiology”
Tracking - 2	38. Our hospital monitors hospital sepsis management, such as time to antibiotic delivery and time from antibiotic order to antibiotic delivery	Q62. “Hospital sepsis treatment”
Tracking - 3	39. Our hospital monitors sepsis outcomes, such as in-hospital mortality, length of hospitalization, and new discharge to a healthcare facility	Q62. “Hospital sepsis outcomes”
Tracking - 4	40. Our hospital assesses use, usability, and impact of hospital sepsis tools to inform their ongoing improvement, such as use of sepsis order sets.	Q62. **ALL** the following: “Use of hospital sepsis tools” **AND** “Usability or acceptability of hospital sepsis tools” **AND** “Impact of hospital sepsis tools”
Tracking - 5	41. Our hospital monitors progress towards achieving hospital goals for sepsis management and/or outcomes	Q62. “Progress towards achieving hospital goals for sepsis treatment and/or outcomes"
Reporting - 1	44. Our hospital reports sepsis treatment and outcome data to nursing, physician, unit-based, and hospital leadership at routine intervals (e.g., monthly or quarterly), which include: unit-level data, trends over time, and comparative or benchmarking data (e.g., comparison to other similar units or hospitals)	Q64a. **ALL OF THE FOLLOWING**: “Unit-specific or service-specific data” **AND** “Benchmarking or comparative data” **AND** “Temporal trends”
Education - 1	47. Our hospital provides sepsis-specific training and education in the hiring or on-boarding process for healthcare staff and trainees.	**IF** "**YES**" to Teaching hospital (from page 1 of survey): Q65: **BOTH** “Trainees” **AND** at least 2 non-trainee categories. **IF "NO"** to Teaching hospital (from page 1 of survey) Q65: **ANY** two non-trainee categories.
Education - 2	48. Our hospital provides annual sepsis education to clinical staff.	Q66: ≥2 categories selected (except "None of the above")
Education - 3	49. Our hospital provides written and verbal sepsis education to patients, families, and/or caregivers prior to discharge.	Q61. **BOTH** "Written educational material about sepsis" **AND EITHER** "Direct 1:1 education on sepsis from a healthcare personnel" **OR** "Pre-recorded video material about sepsis "

5.1.3 Characteristics of Measured Entities

Reliability Testing:

The demographics for the 59 hospitals that were included in the sample are included below.

Hospital size (# of beds)	N	%
<100	8	13.6%
100 – 199	15	25.4%
200 – 299	11	18.6%
300 – 399	12	20.3%
400 - 499	4	6.8%
≥500	9	15.3%
Total	59	100%

*Data from the 2024 Michigan Certificate of Need Annual Survey, Basic Total Licensed Beds Utilization Statistics

Profit Status	N	%
For Profit	4	6.8%
Non-Profit	55	93.2%
Total	59	100%

*Data from AHA's Data Hub

Rural/Urban*	N	%
Rural	10	16.9%
Urban	49	83.1%
Total	59	100%

*Based on 2023 Rural-Urban Continuum Codes from the Economic Research Service (https://www.ers.usda.gov/data-products/rural-urban-continuum-codes). Urban = 1 – 3; rural = 4 – 9)

Validity Testing:

Characteristics of hospitals included in the calculation for correlation between Core Elements Score (based on NHSN data) and CMS SEP-1 score:

Bed Size	**N. of CCNs**	%
0-25	190	6.7
26-50	314	11.1
51-100	462	16.4
101-250	928	32.9
251-500	618	21.9
>=500	311	11.0
Total	2823	100

Region	**N. of CCNs**	**%**
Northeast	427	15.1
Midwest	702	24.9
South	1084	38.4

West	600	21.3
Other territories	10	0.4
Total	2823	100

5.1.4 Characteristics of Units of the Eligible Population*

Reliability testing is at the hospital level, please see question 5.1.3.

Validity Testing:

HMS Sepsis Registry: Table 1 Core Elements Score (based on HMS data)

Table 1 for 35,777 hospitalizations included in the Core Elements Score Analysis	
Age, years, median (IQR)	71 (61-80)
Male sex, N (%)	17830 (49.8%)
BMI, kg/m2, median (IQR)	27.8 (23.1-33.6)
Hospitalized in prior 90 days	11442 (32.0%)
Admitted from SNF, SAR, or LTAC	4955 (13.8%)
Chronic health conditions	
Baseline cognitive impairment	6914 (19.3%)
Baseline functional impairment (ADL)	13866 (38.8%)
Cerebrovascular disease	5846 (16.3%)
Chronic pulmonary disease	2755 (7.7%)
Dementia	4831 (13.5%)
Diabetes	14026 (39.2%)
Leukemia or lymphoma	1153 (3.2%)
Moderate or severe kidney disease	12012 (33.6%)
Solid malignancy, no metastasis	5475 (15.3%)
Metastatic solid tumor	2521 (7.0%)
Moderate or severe liver disease	1036 (2.9%)
Physiologic features on Admission	
Maximum creatinine	1.20 (0.90-1.87)
Maximum lactate	2.10 (1.10-3.10)
Acutely altered mental status	15642 (43.7%)
Minimum PaO2 to FiO2 ratio	309.5 (203.1-476.2)
Positive COVID-19	3247 (9.1%)
Vasopressors within 6 hours	3978 (11.1%)
Mechanical ventilation within 6 hours	2342 (6.5%)
Site of infection	
Bacteremia	28 (0.1%)
Cardiac	209 (0.6%)
Central nervous system	227 (0.6%)
Gastrointestinal	2500 (7.0%)
Genitourinary	7052 (19.7%)
Respiratory	17609 (49.2%)
Skin and soft tissue OR other (sinusitis, tonsillitis)	3195 (8.9%)
No specified infection	4957 (13.9%)
Outcomes	
Length of hospitalization in days, med (IQR)	6.0 (3.0-9.0)
In-hospital mortality	4209 (11.8%)
Hospice discharge	2656 (8.4%)
In-hospital mortality OR hospice discharge	6923 (19.4%)
30-day mortality	6968 (19.5%)

5.3.3 Method(s) of Validity Testing

The early sepsis bundle is a composite measure of data including delivery of key care elements early in their hospitalization. These include:

Element	Eligibility for Element	Pass (Received)
1	All cases	Initial lactate is resulted within 3 hours of hospital arrival
2	All cases with an elevated lactate (> 2 mmol/L) collected during the first 3 hours	Second lactate results within 4 hours of first elevated lactate result
3	All cases with a Primary Discharge ICD-10 code of Pneumonia, Sepsis, or Respiratory Failure	Blood culture collected within 3 hours of hospital arrival
4	All patients with an antibiotic delivered within 2 calendar days of arrival	Blood culture is collected prior to first antibiotic administration
5 through 7	Includes all cases with a Primary Discharge ICD-10 code of Pneumonia, Sepsis, or Respiratory failure. Excludes cases with a positive COVID-19 or Influenza A/B test on presentation and patients who do not display symptoms of sepsis (<2 SIRS criteria, Lactate <2.0, WBC 4-12, and no provider documented symptoms of infection). Hypotension defined as SBP<90mmHg OR MAP<65mmHg OR initiation of IV vasopressors within 2 hours of arrival.	Antibiotic delivered within 5 hours of hospital arrival for non-hypotensive patients; Antibiotic delivered within 3 hours of hospital arrival for hypotensive patients
8	Patients presenting with hypoperfusion (SBP < 90, MAP < 65, Lactate >=4, or IV vasopressors initiated within first 3 hours of encounter) without relative contraindications to fluid. Note: Relative contraindications to fluid include ESRD/Stage 5 CKD, Ejection Fraction<=39%, Severe-Critical Aortic Stenosis.	>= 30ml/kg IV fluid delivered within 6 hours of hospital arrival. - For patients with BMI <= 30: Use actual body weight. - For patients with BMI > 30: Use ideal body weight.
9	All cases meeting any of the following criteria: 1. Patients presenting with hypoperfusion(SBP<90, MAP<65, Lactate>=4, or IV vasopressors initiated within first 3 hrs of encounter) with or without relative contraindications to fluid. 2. Patients presenting with intermediate lactate (2-4) without relative contraindications to fluid. Note: Relative contraindications to fluid include ESRD/Stage 5 CKD, Ejection Fraction<=39%, Severe-Critical Aortic Stenosis.	>= 30ml/kg IV fluid delivered within 6 hours of hospital arrival - For patients with BMI <= 30: Use actual body weight. - For patients with BMI > 30: Use ideal body weight.
10	All cases meeting both criteria: 1. Within 2 hours of hospital arrival: MAP < 65 mmHg OR SBP < 90mmHg OR IV vasopressors initiated. 2. Within hours 3 to 6 of hospital arrival: SBP < 90mmHg OR IV vasopressors initiated.	Receipt of IV vasopressor within 6 hours of hospital arrival
11	All cases with MAP < 65 OR SBP < 90 OR IV vasopressors initiated within 2 hours of hospital arrival	SBP > 90 AND no IV vasopressors initiated in hours 3 to 6 of hospital arrival
Met All Elements	All cases meeting eligibility criteria for measures 1-5 and 9-11.	Cases that received goal treatment for measures 1-5 and 9-11.