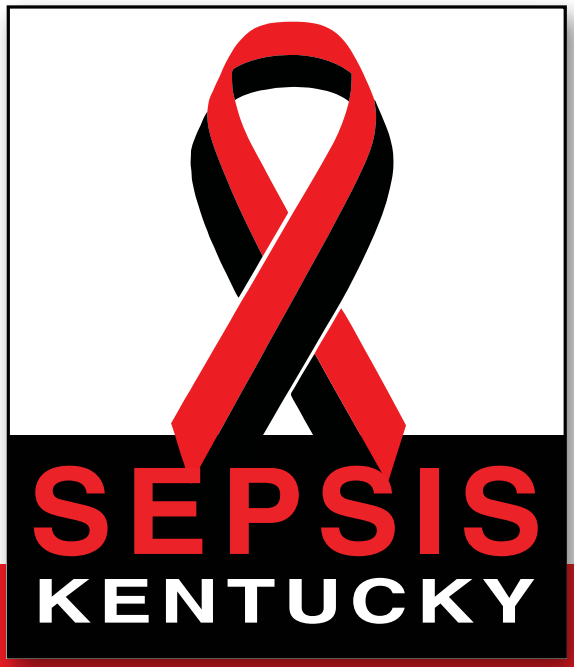

Kentucky Sepsis Consortium

Encyclopedia of Measures

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Kentucky Hospital Association

QUALITY KENTUCKY
Health Care Quality Improvement Continues

Kentucky Hospital Research & Education Foundation

KY Sepsis Consortium

Encyclopedia of Measures

Table of Contents

Postopertative Sepsis Rate

Facilities that perform Inpatient surgeries

Sepsis: Post-op Rate – AHRQ PSI-13

Data Source(s): Administrative claims data

Payer: All Payer

Baseline Period: CY 2019

Measure Type: Outcome

Postoperative sepsis cases (secondary diagnosis) per 1,000 elective surgical discharges for patients ages 18 years and older

- **Numerator:** Discharges among cases meeting the inclusion and exclusion rules for the denominator, with any AHRQ designated secondary ICD-10 diagnosis codes for sepsis.
- **Demoninator:** Elective surgical discharges for patients ages 18 years and older, with any listed ICD-10-PCS procedure codes for an operating room procedure. **These codes are listed here.**

Calculation: (Numerator/Demoninator) X 1000

Specifications/Definitions: **AHRQ PSI 13** (navigate to PSI 13 Postoperative Sepsis Rate)

Data Entry/Transfer: For hospitals who have signed a Data Sharing Agreement with KHA for their KY Inpatient and Outpatient (IPOP) administrative data, these data elements will be extracted and uploaded to KQC.

Monitoring Period: Monthly

KQC Measure ID(s): 57: SEPSIS-1a Postoperative Sepsis (AHRQ - PSI 13)

Hospital-Onset Sepsis Mortality Rate

Sepsis: Mortality Rate (Not Present on Admission)

Data Source(s): Administrative claim

Payer: All Payer

Baseline Period: CY 2019

Measure Type: Outcome

In-hospital deaths per 1,000 discharges, among patients ages 18 through 89 years or obstetric patients, with hospital-onset sepsis

- **Numerator:** Number of in-hospital deaths due to severe sepsis and septic shock.
- **Demoninator:** Number of patients with hospital-onset severe sepsis/septic shock. Note: hospital-onset is an infection that appears 48 hours or more after admission[1].

Calculation: (Numerator/Demoninator) X 1000

Specifications/Definitions: For specific diagnosis codes identifying severe sepsis/septic shock, refer to the numerator specifications for **AHRQ PSI 13** (navigate to PSI 13 Postoperative Sepsis Rate).

Data Entry/Transfer: For hospitals who have signed a Data Sharing Agreement with KHA for their KY Inpatient and Outpatient (IPOP) administrative data, this data element will be extracted and uploaded to KQC.

Monitoring Period: Monthly

KQC Measure ID(s): 194: SEPSIS-1c Hospital-Onset Sepsis Mortality Rate

For more information on reducing sepsis, please visit:

[1] **http://www.surgeryencyclopedia.com/Fi-La/Hospital-Acquired-Infections.html#ixzz4O1GlPiWy**
http://bmcmedicine.biomedcentral.com/articles/10.1186/1741-7015-12-40
https://systematicreviewsjournal.biomedcentral.com/articles/10.1186/s13643-015-0103-6
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3470069/

Overall Sepsis Mortality Rate

All facilities

Sepsis: Mortality Rate

Data Source(s): Administrative claims

Payer: All Payer

Baseline Period: CY 2019

Measure Type: Required Outcome Measure

In-hospital deaths per 1,000 discharges, among patients ages 18 through 89 years or obstetric patients, with sepsis

- **Numerator:** Number of in-hospital deaths due to severe sepsis and septic shock
- **Demoninator:** Number of patients with severe sepsis/septic shock[2]

Calculation: (Numerator/Demoninator) X 1000

Specifications/Definitions: For specific diagnosis codes identifying severe sepsis/septic shock, refer to the numerator specifications for **AHRQ PSI 13** (navigate to PSI 13 Postoperative Sepsis Rate).

CMS excludes assignment to comfort/palliative care at or within 6 hours of admission to determine sepsis mortality. It is a hospital's choice whether to include or exclude comfort/palliative care, *as long as the monthly measurement is consistent with the baseline measurement and throughout the monitoring period.*

Data Entry/Transfer: For hospitals who have signed a Data Sharing Agreement with KHA for their KY Inpatient and Outpatient (IPOP) administrative data, these data elements will be extracted and uploaded to KQC.

Monitoring Period: Monthly

KQC Measure ID(s): 195: SEPSIS-1d Overall Sepsis Mortality Rate

[2] This measure includes hospital-onset sepsis cases, post-operative sepsis cases, AND any cases that present with sepsis to the hospital (for example, those cases coming in as transfers, or presenting in the emergency department). This measure focuses on measuring the management of sepsis patients once they are identified.

Sepsis Screening to be Performed at Triage

All Acute/CAH/Rural Facilities

Sepsis – *Excludes LTACH, Psych and Rehab Hospitals*

Data Source(s): Facility

Payer: All Payer

Baseline Period: July - September 2021

Sepsis Screening to be performed at triage – the rate of patients presenting to the emergency department who are screened for sepsis

- **Numerator:** Number of emergency department patients 18 years of age and older screened.
- **Demoninator:** Number of patients 18 years of age and older presenting to the emergency department.

Calculation: (Numerator/Demoninator) X 1000

Specifications/Definitions: Sepsis screening to be performed at triage to include:

- Assessing for presence of known or suspected infection ***
- Assessing for presence of 2 or more Systemic Inflammatory Response Syndrome (SIRS) criteria:
  - tachycardia (heart rate >90 beats/min)
  - tachypnea (respiratory rate >20 breaths/min)
  - fever or hypothermia (temperature >38.3 °C or <36 °C) (>100.9 °F or <96.8 °F)
  - Leukocytosis, leukopenia, or bandemia (white blood cells >12,000/mm3, <4,000/mm3 or bandemia ≥10%)
- Organ dysfunction (MAP <65 torr/MAP<65 mmHG, Systolic BP <90, Creatinine > 2.0, Serum Lactate > 2.0
- Platelets less than 100K
- Total Bilirubin >2.0 mg/dL (34.2 mmol/L), INR >1.5 upper limit normal or a PPT>60 sec
- Urine output < 0.5ml/kg/hr. for two consecutive hours with documented or suspected infection
- Acute respiratory failure as evidenced by a new need for invasive or non-invasive mechanical ventilation

*** **Note:** Sepsis is the body's overwhelming and sometimes life-threatening response to infection. In the context of known or suspected infection, the other sepsis screening criteria should be as-sessed, so the presence of known or suspected infection is the first element of the sepsis screen to be performed at the time of triage. In the absence of this element, the screen is negative. If a known or suspected infection is present, continue with the remaining portion of the screen at the time of triage. In the absence of reason for presentation being provided by the patient, accompa-nying family member/friend/emergency services provider*, sepsis screen should be performed as sepsis cannot be ruled out. If the screen is not performed, that should be counted as an in-complete screen (fall-out).

(*Known or suspected infection or unable to assess)

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Sepsis Screening to be Performed at Triage

All Acute/CAH/Rural Facilities

CMS SIRS & OD criteria delineates between adult patients who are pregnant with gestational age 20 weeks and older:

Two or more manifestations of systemic infection according to the Systemic Inflammatory Response Syndrome (SIRS) criteria, which are:

- **For SIRS criteria, use the table below.**
  - Use the Non-Pregnant criteria if Value "2" was selected for the Pregnant 20 Weeks Through Day 3 Post-Delivery data element.
  - Use the Pregnant 20 weeks through Day 3 Post-delivery criteria if Value "1" was selected for the Pregnant 20 Weeks Through Day 3 Post-delivery data element.

Non-Pregnant Criteria	Pregnant 20 weeks through Day 3 Post-delivery Criteria
Temperature > 38.3 C or <36.0 C (>100.9 F or <96.8 F)	Temperature ≥ 38.3 C or <36.0 C (≥100.9 F or <96.8 F)
Heart rate (pulse) >90	Heart rate (pulse) > 110
Respiration >20 per minute	Respiration > 24 per minute
White blood cell count >12,000 or <4,000 or >10% bands	White blood cell count >15,000 or <4,000 or >10% bands

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Sepsis Screening to be Performed at Triage

All Acute/CAH/Rural Facilities

Organ dysfunction, evidenced by any one of the following:

- **Systolic blood pressure (SBP) <90 mmHg or mean arterial pressure <65 mmHg.**
  - Use the Non-Pregnant criteria if Value "2" was selected for the Pregnant 20 Weeks through Day 3 Post-delivery data element.
  - Use the Pregnant 20 Weeks through Day 3 Post-delivery criteria if Value "1" was selected for the Pregnant 20 Weeks through Day 3 Post-delivery date element.

Non-Pregnant Criteria	Pregnant 20 weeks through Day 3 Post-delivery Criteria
Systolic blood pressure (SBP) <90 mmHg or mean arterial pressure <65 mmHg	Systolic blood pressure (SBP) <85 mmHg or mean arterial pressure <65 mmHg
Systolic blood pressure decrease of more than 40 mmHg	Systolic blood pressure decrease of more 40 mmHg
Acute respiratory failure as evidenced by a new need for invasive or non-invasive mechanical ventilation.	Acute respiratory failure as evidenced by a new need for invasive or non-invasive mechanical ventilation.
Creatinine >2.0 mg/dL	Creatinine > 1.2 mg/dL
Urine output <0.5 mL/kg/hour for two consecutive hours	Urine output <0.5 mL/kg/hour for two consecutive hours
Total Bilirubin >2 mg/dL (34.2 mmol/L)	Total Bilirubin > 2 mg/dL (34.2 mmol/L)
Platelet count <100,000	Platelet count <100,000
INR > 1.5 or aPTT >60 sec	INR >1.5 or PTT >60 sec
Lactate > 2 mmol/L (18.0 mg/dL)	Lactate >2 mmol/L (18.0 mg/dL) **NOTE:** Do not use lactate obtained during active delivery defined as documentation of uterine contractions resulting in cervical change (dilation or effacement) through delivery or childbirth.

Sepsis Bundle – 3 and 6 Hour

DATA SOURCE(S): Facility

PAYER: All Payer

BASELINE PERIOD: July - September 2021

MEASURE TYPE: Align with with the CMS and Sepsis Consortium Bundle – 3 and 6 Hour measure

Link to the CMS 3 and 6 Hour Bundle Measure:
https://cmit.cms.gov/cmit/#/MeasureView?variantId=778&sectionNumber=1

Link to the CMS Sampling Guidance:
https://qualitynet.cms.gov/inpatient/specifications-manuals#tab2

- **Bundle Compliance:** Percent of identified sepsis patients who receive all of the 3 and 6 hour bundle elements.
- **Numerator:** Patients who received ALL of the following within three hours of presentation of severe sepsis:
  - Initial lactate level measurement
  - Broad spectrum or other antibiotics administered
  - Blood cultures drawn prior to antibiotics **AND** received within six hours of presentation of severe sepsis
  - Fluid Resuscitation: Administer 30 mL/kg of crystalloid fluid** for hypotension (defined as mean arterial pressure MAP < 65) or lactate ≥ 4)*

Number of identified sepsis patients who received all of the following within six hours of presentation of severe sepsis.

The **"6-hour septic shock bundle"** contains all the therapeutic goals to be completed within 6 hours of the time of presentation with septic shock:

1. to apply vasopressors (for hypotension that does not respond to initial fluid resuscitation) to maintain a MAP ≥65 mmHg,
2. to consider measurement of CVP and ScvO2 when arterial hypotension persists despite volume resuscitation or initial lactate ≥4 mmol/L, and
3. to re-measure lactate if initial lactate was elevated (>2.0 mmol/L)
4. Repeat volume status and tissue perfusion assessment is performed

* Two low BPs (either SBP<90 or MAP<65) within 3 hours of each other, not needing to be consecutive and can be 6 hours prior to or after time zero.

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Exclusion: Crystalloid Fluid Administration for Hypotension due to Sepsis.

Please refer to CMS for exclusion criteria:
https://qualitynet.cms.gov/inpatient/specifications-manuals#tab2

- **Denominator:** All inpatients with an ICD-10-CM Principal or Other Diagnosis Code of Sepsis, Severe Sepsis or Septic Shock

Denominator Exclusions:

The following patients are excluded from the denominator: Severe sepsis is not in present patients transferred from another acute care facility; Patients receiving IV antibiotics for more than 24 hours prior to presentation of severe sepsis; Patients with a Directive for Comfort Care or Palliative Care within 6 hours of presentation of severe sepsis; Patients with an Administrative Contraindication to Care within 6 hours of presentation of severe sepsis; Patients with an Administrative Contraindication to Care within 6 hours of presentation of septic shock; Patients with a Directive for Comfort Care or Palliative Care within 6 hours of presentation of septic shock; Patients with septic shock who are discharged within 6 hours of presentation; Patients with severe sepsis who are discharged within 6 hours of presentation; Patients with a Length of Stay >120 days; Patients included in a Clinical Trial

Specifications/Definitions:

This measure focuses on adults 18 years and older with a diagnosis of severe sepsis or septic shock. Consistent with Surviving Sepsis Campaign guidelines, the measure contains several elements, including measurement of lactate, obtaining blood cultures, administering broad spectrum antibiotics, fluid resuscitation, vasopressor administration, reassessment of volume status and tissue perfusion, and repeat lactate measurement. As reflected in the data element and their definitions, these elements should be performed in the early management of severe sepsis and septic shock.

Sepsis: Bundle Compliance – 3 Hour LTACH Facilities

Data Source(s): Data will be provided by hospital

Payer: All Payer

Baseline Period: October-December 2025

Measure Type: Process Measure

Percent of identified sepsis patients who receive all the 3 hour bundle elements

- **Numerator:** Patients who received ALL of the following within three hours of presentation of severe sepsis:
  - Initial lactate level measurement
  - Broad spectrum or other antibiotics administered
  - Blood cultures drawn prior to antibiotics
  - Fluid Resuscitation: Administer 30 mL/kg of crystalloid fluid** for hypotension (defined as mean arterial pressure (MAP) < 65) or lactate (≥ 4)*

Number of identified sepsis patients who received all of the following within six hours of presentation of severe sepsis.

The **"6-hour septic shock bundle**" contains all the therapeutic goals to be completed within 6 hours of the time of presentation with septic shock:

1. to apply vasopressors (for hypotension that does not respond to initial fluid resuscitation) to maintain a MAP ≥65 mmHg,
2. to consider measurement of CVP and ScvO2 when arterial hypotension persists despite volume resuscitation or initial lactate ≥4 mmol/L, and
3. to re-measure lactate if initial lactate was elevated
   - CF volumes ordered that are equivalent to 30 mL/kg or a lesser volume **with a reason** for the lesser volume specifically documented by the physician/APN/PA are the target ordered volume.

* Two low BPs (either SBP<90 or MAP<65) within 3 hours of each other, not needing to be consecutive and can be 6 hours prior to or after time zero.

** Crystalloid Fluid (CF) Administration due to Sepsis

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- A physician/APN/PA order for a volume of CFs that is within 10% < 30 mL/kg is acceptable for the target ordered volume. Documentation of a reason for a volume that is within 10% less than 30 mL/kg is not required.
- A physician/APN/PA order for < 30 mL/kg of CFs is acceptable for the target ordered volume if all of the following criteria were met:
  - There is a physician/APN/PA order for the lesser volume of CFs as either a specific volume (e.g., 1500 mL) or a weight-based volume (e.g., 25 mL/kg).
  - AND a reason for ordering a volume < 30 mL/kg of CFs. Reasons include and are not limited to:
    - Concern for fluid overload
    - Heart failure (HF or CHF))
    - Renal failure (RF or ESRF)
    - Blood pressure responded to lesser volume a portion of the CF volume was administered as colloids (if a portion consisted of colloids, there must be an order and documentation that colloids were started or noted as given).
  - Physician/APN/PA can use ideal body weight (IBW) to determine the target ordered volume if all of the following conditions are met. Other acceptable weight terms include predicted weight, dosing weight, and adjusted body weight.
    - Physician/APN/PA documents whether the patient is obese or that the patient has a BMI > 30. Documentation of either obese or BMI > 30 is acceptable.
    - Physician/APN/PA documents IBW is used to determine target ordered volume.
    - IBW is present in the medical record, abstractors should not calculate the IBW.
  - There is documentation that the patient has an implanted ventricular assist device (VAD) prior to or at the time of identifying the need for CFs, regardless of the volume and rate of CFs ordered.
  - Physician/APN/PA or nursing documentation indicates patient, or authorized patient advocate has refused IV fluid administration prior to or within six hours following presentation of septic shock.
  - Physician/APN/PA or nursing documentation indicates no CFs were ordered because the patient was not volume or not fluid responsive. Documentation must indicate that invasive or noninvasive measurements of cardiac output (CO), cardiac index (CI), stroke volume (SV), or stroke volume index (SVI) were used to determine if the patient was not volume or fluid responsive.

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- **Denominator:** Inpatients age 18 and over with an ICD-10-CM Principal or Other Diagnosis Code of Sepsis, Severe Sepsis or Septic Shock

Denominator Exclusions:

The following patients are excluded from the denominator: Severe sepsis is not present.

Patient admitted to the LTACH facility with an active diagnosis of severe sepsis and/or septic shock, with ongoing treatment initiated at the transferring facility; Patients receiving IV antibiotics for more than 24 hours prior to presentation of severe sepsis; Patients with a Directive for Comfort Care or Palliative Care before or within 6 hours of presentation of severe sepsis; Patients with an Administrative Contraindication to Care before or within 6 hours of presentation of severe sepsis; Patients with an Administrative Contraindication to Care before or within 6 hours of presentation of septic shock; Patients with a Directive for Comfort Care or Palliative Care before or within 6 hours of presentation of septic shock; Patients with septic shock who are discharged within 6 hours of Presentation; Patients with severe sepsis who are discharged within 6 hours of Presentation; Patients with a Length of Stay >120 days; Patients included in a Clinical Trial.

Specifications/Definitions:

This measure focuses on adults 18 years and older with a diagnosis of severe sepsis or septic shock. Consistent with Surviving Sepsis Campaign guidelines, the measure contains several elements, including measurement of lactate, obtaining blood cultures, administering broad spectrum antibiotics, fluid resuscitation, vasopressor administration, reassessment of volume status and tissue perfusion, and repeat lactate measurement. As reflected in the data element and their definitions, these elements should be performed in the early management of severe sepsis and septic shock.

Calculation: (Numerator/Demoninator) X 1000

Methodology: See CMS sampling methodology instructions:
https://qualitynet.cms.gov/inpatient/specifications-manuals#tab2

Monitoring Period: Monthly

KQC Measure ID(s): 610 SEPSIS-2f 3-Hour Sepsis Bundle Compliance (LTAC)

Sepsis: Blood Culture Contamination

Data Source(s): EHR or laboratory-generated report. Data will be provided by hospital.

Payer: All Payer

Baseline Period: 4th Quarter 2022

Measure Type: Process Measure

The number of blood culture sets with growth of skin commensals without the same organism in other sets collected within 24 hours over the total number of all eligible blood culture sets collected.

- **Numerator:** The number of blood culture sets with growth of skin commensals without the same organism in other sets collected within 24 hours.
- **Demoninator:** The total number of all eligible blood culture sets collected.

Calculation: (Numerator/Demoninator) X 1000

Specifications/Definitions: CDC Recommendation

Monitoring Period: Monthly

KQC Measure ID(s): 321: SEPSIS Blood Culture Contamination

For more information, please refer to:
NHSN Terminology | NHSN | CDC

You may use the Terminology Browser to search for specific organisms.
The synonym list is also available for your use.

Continued next page >

Structural Sepsis Bundle Measure

Required Structural Sepsis Bundle Measures:

1. Are standing orders for nurses containing bundle elements available for patients who screen positive for sepsis? **Y/N**

   246 SEPSIS-3a Bundle Elements Standing Orders
   Monthly Submission starting July 1, 2021

2. Are order sets for MDs, APRNs, other LIPs containing bundle elements available for patients who screen positive for sepsis? **Y/N**

   247 SEPSIS-3b SEPSIS Order Sets
   Monthly Submission starting July 1, 2021