



*The Hospital You Trust  
To Care For Those You Love*

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## Guideline: Sepsis Identification And Management in Adults

### GUIDELINE:

Prevention, identification and management of sepsis in adults

### BACKGROUND:

This standard pertains to adult patients (age 18 years and older) being cared for in a hospital-based emergency department, free-standing emergency department, observation unit, or inpatient environment EXCEPT for the following:

1. Rehabilitation
2. Skilled Nursing
3. Behavioral Health
4. Obstetrical Units (LDRP)

Separate guidance is available for the screening and management of patients in these specialized care environments and for patients under the age of 18 years.

### RECOMMENDATIONS:

Establish standards for (a) the early identification and prompt, evidence-based management of sepsis, severe sepsis, severe sepsis with hypoperfusion, and septic shock, and (b) the necessary data, people, and processes to implement, oversee, and monitor these activities.

The key tenets of sepsis identification and management center on “Three R’s”:

1. Recognize – Perform timely and consistent assessments (both initial and ongoing) for infection, evidence of the systemic inflammatory response syndrome (SIRS), and signs of organ dysfunction.
2. Resuscitate – Deliver antibiotics, fluids, and other indicated therapies within designated time periods (e.g., 3- and 6-hour bundles).
3. Refer – Reassess and determine if necessary to refer to a higher level of care. Do not delay involving critical team members (e.g., Rapid Response Team, Code Sepsis Teams, Critical Care consultants).

This document provides an overview of the selected subject matter and associated reference resources, but it cannot be expected to cover every specific clinical situation. In every case, the screening results and rationale for treatment should be clearly documented in the medical record.

## **General Information:**

It is estimated that one severe sepsis or septic shock patient presents to a US emergency department every minute, and severe sepsis represents approximately 20% of all ICU admissions. Mortality for severe sepsis (with or without hypoperfusion) and septic shock ranges from 28 to 50% - an estimated 215,000 deaths from severe sepsis occur in the US each year and the costs associated with the disease are in excess of \$16 billion. Indeed, severe sepsis is the leading cause of death in non-cardiac ICUs and the 10th leading cause of death overall in US. Patients may present for treatment anywhere along the sepsis continuum, from sepsis to severe sepsis to hypoperfusion to septic shock. Time is of the essence in treating this deadly disease, regardless of the stage at which it presents, as early recognition and timely treatment has been shown to reduce progression. It is estimated that in septic shock, the risk of death increases by over 7% for every hour that proper treatment is delayed.

The Surviving Sepsis Campaign (SSC; last updated 2012) is widely recognized as the industry standard source of best practice recommendations related to the identification and treatment of severe sepsis patients, including the 3- and 6-hour bundles. With this Standard we want to fully implement the recommendations of the SSC, with the exception of a few of the more invasive measures in the 6-hour bundle that remain optional under this standard as they are not universally accepted. These include monitoring of CVP and titration of therapy to ScvO<sub>2</sub> end targets.

Additionally, sepsis can present in any of our acute care environments, so we are focusing not just on treatment in the intensive care unit (a common starting point for sepsis initiatives), but also on timely screening and intervention at the point of first presentation - typically, the Emergency Department - and upon any patient status changes during the course of an inpatient stay.

## **Sepsis Screening:**

Standard Criteria (Elements) for Sepsis Screens – The screening of patients for sepsis should include the following elements:

- A. Suspected or Confirmed Infection (aka “Question 1”) – From any potential source including, but not limited to, pulmonary, urinary tract, abdominal, CNS (meningitis), skin/soft tissue, bone/joint, wound (surgical or traumatic), blood stream, catheter/device. Particular attention should be paid to those patients with predisposing risk factors for infection such as immune suppression (whether as result of certain disease states or from immune suppressing medications such as corticosteroids, anti-inflammatory biologics or cancer chemotherapeutic agents), recent surgical procedure, or chronic illnesses such as chronic renal or hepatic failure.
- B. Signs and Symptoms of Systemic Inflammatory Response Syndrome /SIRS (aka “Question 2”)
  1. Temperature >38.3° C (101.0° F) or <36° C (96.8° F)
  2. Acute mental status changes
  3. Heart rate >90 bpm
  4. Respiratory rate >20 bpm
  5. Bands >10%
  6. WBC count >12,000 or <4000

7. Plasma glucose >140 mg/dL or 7.7 mmol/L in the absence of diabetes

C. Signs of Organ Dysfunction (aka "Question 3")

1. Systolic blood pressure <90 mmHg or mean arterial pressure (MAP) <65 mmHg
2. Systolic blood pressure decrease of >40 mmHg from baseline
3. Creatinine >2.0 mg/dL (34.2 mmol/L) OR creatinine increase from baseline >0.5 mg/dL OR urine output <0.5 ml/kg/hour for 2 hours or more
4. Bilirubin >2 mg/dL (34.2 mmol/L)
5. Platelet count <100,000
6. Lactate >2 mmol/L (18.0 mg/dL)
7. INR >1.5 or aPTT >60 seconds
8. Acute lung injury with PaO<sub>2</sub>/FiO<sub>2</sub> <250 in the absence of pneumonia as infection source
9. Acute lung injury with PaO<sub>2</sub>/FiO<sub>2</sub> <200 in the presence of pneumonia as infection source

D. Screening Results – based upon the screening criteria above, patients can be placed into one of the following categories

1. No Sepsis – absence of suspected or documented infection or infection with fewer than 2 SIRS criteria (once screening complete, including lab results)
2. Sepsis – Suspicion or documentation of infection PLUS two or more SIRS criteria met
3. Severe Sepsis – Sepsis (as defined above) PLUS one or more organ dysfunctions.
4. Severe Sepsis w/ hypoperfusion – Severe sepsis (as defined above) in the presence of hypotension (SBP <90, MAP <65, or SBP decrease of >40) AND/OR lactate ≥4
5. Septic Shock – Severe sepsis with hypoperfusion (as defined above) that requires vasopressors after initial fluid resuscitation of at least 30 ml/kg in order to maintain BP and signs of improved perfusion

E. Process for Conducting Screen Emergency Department –

1. In Triage – Triage nurse should complete hard copy/electronic sepsis screening form with all available elements on ALL ADULT PATIENTS. It is recommended that a nurse-driven protocol be put in place to obtain a POC (point-of-care) or STAT lactate if the initial screen is positive for sepsis (i.e., suspected/confirmed infection plus at least two SIRS criteria). Provider should be notified right away of all positive sepsis screens. Patients meeting criteria for severe sepsis, severe sepsis w/ hypoperfusion, or septic shock should be bedded immediately and resuscitation/3-hour treatment bundle initiated (see description below).
2. Once Initial Laboratory Values are Available – All patients for whom "Question 1" (suspected or confirmed infection) is positive will need to have at a minimum a white blood cell count, band count, and glucose drawn to complete the SIRS criteria portion of the sepsis screen. Rescreening should be completed by bedside nurse once initial lab values are resulted in order to identify additional signs of SIRS or organ dysfunction. If criteria are met for severe sepsis, severe sepsis w/ hypoperfusion, or septic shock, the 3-hour bundle should be initiated immediately.

F. Intensive Care Units

1. On Admission – The bedside nurse should complete a hard copy/electronic sepsis screening form upon admission to ICU for all patients.

2. PRN Change of Condition – The bedside nurse should complete another hard copy/electronic sepsis screening form as needed with any concerning change in patient condition.

#### G. Other Inpatient/Observation Units (e.g., Med/Surg)

1. On Admission – The bedside nurse should complete a hard copy/electronic sepsis screening form upon admission to the unit for all patients.
2. At Change of Shift During Nursing Assessment – The bedside nurse should repeat the hard copy/electronic sepsis screening form at the start of each shift.
3. PRN Change of Condition – The bedside nurse should repeat the hard copy/electronic sepsis screening form as needed with any concerning change in patient condition (e.g., change in mentation, change in vital signs, new or worsening lab values suggesting infection or organ dysfunction).

#### H. Use of Lactate Level

1. When - Upon determination of a positive sepsis screen, a POC or STAT lactate should be completed, ideally via nurse driven protocol or Code Sepsis process.
2. Turnaround Time – Lactate should be resulted within 60 minutes maximum to ensure initial treatment bundle can be completed within 3 hours. POC/iSTAT lactate is recommended when possible.
3. Repeat Lactate Level – If initial lactate  $>2$ , a lactate level should be repeated within 6 hours of time zero (see definition below).
4. Ongoing Monitoring – Recheck lactate every 4-6 hours until within normal limits to monitor progress.

#### I. Definition of Time Zero – “Time Zero” is the time at which the clock starts for purposes of tracking the 3- and 6-hour intervention bundles described below.

1. Emergency Department – Time Zero for all ED patients is defined as arrival time in the Emergency Department (not triage time).
2. Other Locations – In other locations (e.g., ICU, Med/Surg), Time Zero is defined as the time of the first positive screen for either severe sepsis, severe sepsis w/ hypoperfusion, or septic shock.

### A. Intervention

1. “Simple” Sepsis Patients – Management of the simple sepsis patient is at the discretion of the patient care team. Antibiotic therapy should be initiated if the suspected or confirmed infection source is likely bacterial in nature. Necessity of admission to an inpatient unit for treatment is dependent upon patient condition. In all cases, the patient should have close follow up to monitor for progression to severe sepsis. Simple sepsis alone does not necessitate implementation of the full 3-hour bundle described below.
2. Severe Sepsis Patients (with or without Hypoperfusion)...Initiation of the 3-Hour Bundle – These items are to be completed within 3 hours of “time zero” for patients with severe sepsis (with or without hypoperfusion):
  - a. Standard Labs – The following labs should be drawn as soon as possible after “time zero” to ensure all subsequent elements of the bundle can be completed during the 3-hour window:
    - I. Lactate (STAT)
    - II. Comprehensive metabolic panel
    - III. Prothrombin time (PT)

- IV. Partial thromboplastin time (PTT)
  - V. CBC with differential
  - VI. Blood cultures x2 – not to be drawn via indwelling vascular catheter
  - VII. unless newly placed. Cultures should be obtained before the first dose of antibiotics is administered if at all possible.
- b. Additional Symptom-specific Labs/Imaging – The following labs/imaging studies should be added if relevant based on clinical signs/symptoms: urinalysis w/ micro, urine culture, sputum culture, wound culture, chest x-ray, CT scan abdomen, arterial blood gas, and other cultures/ imaging based upon presentation.
  - c. Antibiotics – Broad spectrum IV antibiotics should be initiated pending source identification and sensitivities. First dose to be given within 3-hour window from Time Zero in the Emergency Department setting and within one hour from Time Zero for inpatients.
  - d. STAT 30 ml/kg Fluid Bolus (for severe sepsis patients with hypoperfusion) – Administer STAT minimum 30ml/kg bolus of Normal Saline (or Lactated Ringers) if any of the following apply: SBP <90, MAP <65, SBP decrease from baseline >40mmHg, Lactate  $\geq 4$ . The infusion rate is dependent on the patient's severity of illness, but a bolus can typically be administered at 500cc per 15 minutes via two lines. To meet 3-hour bundle compliance, the bolus must be completed during this timeframe.
  - e. Disposition – Any patient meeting criteria for severe sepsis, severe sepsis w/ hypoperfusion, or septic shock will require inpatient admission and will necessitate immediate transfer to the hospital if presenting at an outlying facility (e.g., freestanding ED). If patient remains hypotensive or continues to have lactate  $\geq 4$  after minimum 30 ml/kg fluid resuscitation, the 6-hour bundle should be initiated and the patient should be admitted/transferred to the ICU.
3. Septic Shock Patients...Addition of the 6-Hour Bundle – In addition to completing all elements of the 3-hour bundle above, the following items are to be completed within 6 hours of “time zero” for patients determined to have septic shock:
- a. Fluid Resuscitation – Continue additional fluid resuscitation as appropriate. Additional modalities for assessment of intravascular volume and adequacy of resuscitation may be valuable.
  - b. Vascular Access – Place central line if central access not already available.
  - c. Vasopressors – If hypotensive following initial minimum 30 cc/kg fluid bolus (described above, in 3-hour bundle), begin treatment with vasopressors via central line.
    - 1. First line – Begin vasopressor treatment with norepinephrine unless contraindicated. Titrate to systolic blood pressure >90 mmHg and/or MAP >65 mmHg.
    - 2. Second line – Consider additional vasopressors as needed.
  - d. Ongoing monitoring – Ongoing and regular assessments of volume status and perfusion should be conducted and documented, either by bedside physical assessment or by other available means.
  - e. Disposition –Patients with ongoing evidence of organ dysfunction, hypoperfusion or shock should optimally have treatment continued in an intensive care unit setting until their condition has stabilized.

B.

## Special Indications / Needs / Considerations

- A. ID Consultation – Early consultation with an Infectious Disease consultant is recommended for all patients with severe sepsis, severe sepsis with hypoperfusion, or septic shock to assist with source identification and antibiotic selection. DNR, Comfort Care, Hospice, or Palliative Care Patients – It is recommended that patients with sepsis be screened for the appropriateness of a Palliative Care consultation and asked about existing advanced directives as soon as possible upon diagnosis, even in the Emergency Department if presenting there. Should palliative care consultation be available and recommended, the consultation should occur within the first three days of the hospital stay to ensure patient wishes are clearly understood and optimal care is delivered.
- B. DNR/Comfort Care patients may be treated with only those elements of the 3- and 6-hour bundles that are appropriate for their status and consistent with their values and wishes. Designated hospice patients and others who are clearly at end of life (e.g., persistent vegetative state) may be removed from the sepsis pathway if agreement exists with patient (or proxy) and these wishes are appropriately documented.

## Additional Elements of Sepsis Management Program

- A. Code Sepsis/Rapid Response Team – It is strongly recommended that inpatient acute care (non-ICU) areas have a Rapid Response Team and/or specific Code Sepsis process that is triggered immediately as soon as any patient screens positive for severe sepsis, severe sepsis with hypoperfusion, or septic shock. This ensures patients receive timely assessment and intervention, and is an important step in monitoring for progression of the disease and possible need for escalation in care.
- B. Orderset Use – Use of a consistent, standard, protocol based orderset for 3- and 6-hour bundles is highly recommended, as it ensures that all elements are provided.
- C. Metric Tracking and Data Reporting – It is recommended that regular review of key sepsis metrics be incorporated into existing process improvement and quality management avenues (e.g., sepsis team, daily huddle, Lean Daily Management). Concurrent case review is also recommended with timely feedback to the care team by the Sepsis Lead or his/her designee. Bundle fall outs and process gaps should also be reviewed at least once a month by the multi-disciplinary sepsis team described below to assess the need to revise or continue with the current sepsis performance improvement plan.

## Program Oversight and Monitoring

- A. Sepsis Lead – Each hospital and/or Freestanding Emergency Department (if not covered by the Sepsis Lead from a parent/affiliated inpatient facility) should designate a Sepsis Lead for their facility
  - 1. Qualifications – Clinical background is preferred (e.g., RN), but an individual with significant experience in a quality oversight/clinical change management role may be qualified as well. Past ED or ICU experience is recommended. The role may not need to be a full-time FTE, but sufficient time must be allotted in order to complete the described duties below.
  - 2. Expectations – The site Sepsis Lead is the primary person responsible for oversight and monitoring of the facility's sepsis program, although they may call upon other individuals for completion of and/or assistance with specific duties as needed. This includes:
    - a. Chairing the multi-disciplinary sepsis team (see below), with the assistance of a physician co-chair if applicable

- b. Monitoring screening and bundle compliance data and outcomes  
Conducting periodic gap analysis to ensure compliance with elements of the sepsis clinical standard and, optimally, concurrent chart review
  - c. Determining, with the assistance of other members of the sepsis team, the relevant course of action when any gaps are determined
  - d. Ensuring implementation of identified performance improvement initiatives
  - e. Communicating progress and results to facility leadership (e.g., A team) and the appropriate Medical Executive committee on a timely and consistent basis
  - f. Providing formal and informal education at various levels throughout the facility
  - g. Supporting clinical documentation specialists and facility leadership in ensuring proper documentation in sepsis cases
  - h. Sharing best practices with sepsis leads from other facilities throughout our system
- B. Multi-disciplinary Sepsis Team – Each hospital (and/or Freestanding Emergency Department, if not covered by the team from a parent/affiliated inpatient facility) should assemble a multidisciplinary team that is charged with implementation of the clinical standard, review of site-specific data, assessment and action plan development on any fall outs, and provision of individual provider/staff feedback.
1. Team composition (required) – A hospital-based team should include at a minimum the following individuals: (Dedicated free-standing Emergency Department teams should include as many of these individuals as possible, and should also engage their primary inpatient referral destinations in regular performance discussions.)
    - a. Designated sepsis lead
    - b. ICU nurse
    - c. Intensivist (preferred) or other physician who frequently admits to ICU
    - d. Emergency Department nurse
    - e. Emergency Department physician
    - f. Nurse from Med/Surg or other inpatient floor
    - g. Hospitalist (preferred) or other physician who frequently admits to non-ICU inpatient unit(s)
    - h. Clinical Pharmacist
    - i. Laboratory director (or designee)
    - j. Director of Clinical Quality Improvement (or similar quality role)
    - k. Respiratory therapist
    - l. Rapid Response/Code Sepsis Team member (if not already represented among the individuals listed above) and/or House Supervisor
  2. Team composition (optional) – Other team members may be added at the facility's discretion and may include representatives from other departments (e.g., infectious disease, infection preventionists) or specialty areas (e.g., cardiology, neurology) as appropriate.
- C. Role of System, Region, and Local Administrative Clinical Leaders – Facility-level administrative teams are responsible for timely deployment of the sepsis management program in their specific facilities. A

more detailed set of sepsis management roles and responsibilities for individual Tenet Home Office, Regional, and Facility leadership and staff will be made available in a separate document.

D. Education – An educational plan should be developed at each facility that is tailored to the site’s needs and program maturity and should address the educational needs of providers, nurses, allied health professionals, and non-licensed patient care staff.

1. At a minimum, initial education designed to enhance the ability to identify early patients at risk for severe sepsis, severe sepsis with hypoperfusion, and septic shock, and the steps needed to prevent the progression of sepsis should be delivered to all Tenet clinical staff along with non-licensed staff members as assigned. Facilities may seek to utilize simulation training with return demonstration of the screening tool, in addition to the content provided via the appropriate online learning systems.

Ongoing educational strategies recommended include:

- a. Unfolding interactive case study scenarios following case review
- b. Review of information available in the Sepsis SharePoint resource folder, including sepsis screening tool tips, lecture outlines, basic hemodynamic monitoring guides, drug titration and precaution tip sheets, and more

## REFERENCES:

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## Attachments:

No Attachments

	Committee	Approver	Date
	Document Control Committee	Clinical Quality Improvement Director [CA]	5/11/2015
	Medical Care Policy	Assistant, Medical Care Policy	7/31/2015
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