# Sepsis Toolkit

## Improving Diagnosis and Treatment of Sepsis

The trusted voice and influential advocate of health care in Nebraska

Dear Health Care Leaders,

Sepsis incidence and health care costs have been on the rise for over 2 decades making it a key topic for health care leaders to understand best practice and drive process improvement. Anyone can get an infection and any infection can lead to sepsis.

According to the CDC, in a typical year:

- At least 1.7 million adults in America develop sepsis.
- At least 350,000 adults who develop sepsis die during their hospitalization or are discharged to hospice.
- 1 in 3 people who dies in a hospital had sepsis during that hospitalization.
- Sepsis, or the infection causing sepsis, starts before a patient goes to the hospital in nearly 87% of cases.

According to the Sepsis Alliance, sepsis is the leading cost of hospitalizations in the U.S. with annual costs for acute sepsis hospitalization and skilled nursing being estimated at $62 billion. This only accounts for a portion of sepsis-related costs with post-discharge costs causing additional burden on health care entities, patients, and families.

The average cost per hospital stay for sepsis is nearly twice the average cost per stay compared to all other conditions. This coupled with the fact that sepsis is the most common cause of readmissions to the hospital, costing more than $3.5 billion each year, drives the necessity to improve sepsis care.

Though studies differ slightly, on average, approximately 30% of patients do not survive a sepsis diagnosis and up to 50% of survivors suffer from post-sepsis syndrome.

In 2019, the Nebraska Hospital Association in partnership with a multidisciplinary team of health care leaders from organizations across the state created the initial NHA Sepsis Toolkit. Since the initial toolkit was launched, the evidence and recommendations regarding sepsis screening and treatment have evolved. With that knowledge, the NHA is proud to present the updated version of the NHA Sepsis Toolkit.

Sincerely,

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| Components | Yes | No | NA | Action Plans (What, By Who, By When) |
|---|---|---|---|---|
| **Organizational Commitment / Team** | | | | |
| Physician / Provider and nursing leadership participate in action planning for sepsis initiatives | | | | |
| Multidisciplinary team in place and regularly occurring meetings from various care areas: ED, ICU, med/surg, perinatal, pediatrics, clinic | | | | |
| Executive sponsor receives regular data reports and provides feedback | | | | |
| Sepsis team is part of/reports to quality structure in hospital | | | | |
| Managing sepsis is aligned with hospital's quality, safety or organizational goals | | | | |
| Baseline data collection completed for process and outcome data | | | | |
| Does your organization complete a sepsis grading consistently per policy | | | | |

| Components | Yes | No | NA | Action Plans (What, By Who, By When) |
|---|---|---|---|---|
| **Dedicated Sepsis Resources / Sepsis Coordinator / Lead** | | | | |
| Dedicated sepsis resource in place (in action steps identify the title) – who is going to take responsibility for outcomes? FTE allocation/time commitment to sepsis role. Other responsibilities in the role – job description | | | | |
| Scope of the Sepsis Program – are all units included? | | | | |

| Components | Yes | No | NA | Action Plans (What, By Who, By When) |
|---|---|---|---|---|
| **Identification / Screening** | | | | |
| Does your facility have an early alert or warning system / process in place? Are there triggers for sepsis screening? | | | | |
| • ED | | | | |
| • ICU | | | | |
| • Inpatient Units | | | | |
| • Perinatal | | | | |
| • Pediatrics | | | | |
| • Clinic | | | | |
| • EMS | | | | |
| • Long-Term Care | | | | |
| Does your organization have a process in place to communicate with area EMS regarding a potential sepsis patient transfer? | | | | |
| Does your organization have a process in place to communicate with area Long-Term Care facilities regarding potential sepsis? | | | | |

| Components | Yes | No | NA | Action Plans (What, By Who, By When) |
|---|---|---|---|---|
| Does the process include specific nursing interventions when a positive screen is obtained?<br>Is a Nurse-Driven Protocol in place? | | | | |
| Is a rapid response process or sepsis alert team in place for a new sepsis presentation? | | | | |

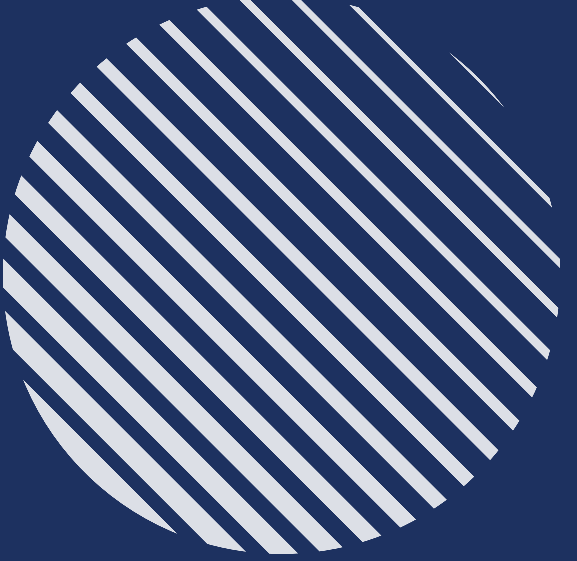
| Components | Yes | No | NA | Action Plans (What, By Who, By When) |
|---|---|---|---|---|
| **Treatment / Implementing the Bundles** | | | | |
| Does your organization use a decision algorithm to address transfer needs and transfer processes in place? i.e. transfer network, communication plan regarding patient | | | | |
| Sepsis order sets are in place and utilized by providers (CPOE/paper) | | | | |
| Nurse-Driven Protocol is in place and utilized appropriately | | | | |
| Sepsis documentation tools are in place and utilized to meet SEP-1 requirements | | | | |
| Communication in place between physician/provider and nurses related to diagnosis and treatment plan specific for sepsis; handoffs readily incorporate appropriate sepsis language | | | | |
| Nursing:<br>• Complete head-to-toe patient assessment<br>• Collect vital signs at a regularly occurring interval dependent on patient stability<br>• Establish IV access – large bore, multiple sites if possible<br>• Consider central line placement if necessary<br>• Initiate sepsis alert – or – ensure all necessary professionals are available to care for the patient. | | | | |
| Laboratory:<br>•Get blood cultures STAT, prior to antibiotic administration<br>•Get lactate level within one hour<br>•Process in place to repeat lactate in 4-6 hrs if > 2 initially | | | | |
| Pharmacy:<br>• Prepare to get antibiotics per order<br>◦ Within 1 hours for ICU – within 3 hours for Emergency Department<br>• Keep formulary and order sets up-to-date for sepsis care | | | | |
| IT:<br>• work with IT and EHR Vendor to create built-in Sepsis workflows | | | | |
| Does your organization have a process in place for assessment and reassessment of volume status and tissue perfusion for sepsis patients?<br>• Does your organization have a process for the provider to document a medical reason for not following volume replacement protocols? | | | | |
| Identify resistance/barriers to components of bundles and developed solutions (fluid resuscitation, blood cultures before antibiotics, repeat lactate, etc.) | | | | |
| Does your organization have a process for determining and documenting TIME ZERO? | | | | |

| Components | Yes | No | NA | Action Plans (What, By Who, By When) |
|---|---|---|---|---|
| **Discharge Planning / Decreased Readmissions** | | | | |
| Process for identifying new physical, mental, and cognitive problems in a patient post-sepsis and referring for appropriate treatment to decrease the chance of long-term or permanent harm and readmission | | | | |
| Initiate Patient focused education regarding signs and symptoms of infection and sepsis during discharge planning | | | | |

| Components | Yes | No | NA | Action Plans (What, By Who, By When) |
|---|---|---|---|---|
| **Quality Measurement / Continuous Improvement** | | | | |
| Define real time method for tracking patients (i.e. patient log) | | | | |
| Define concurrent review process for core measure and core measure defect review process | | | | |
| Sepsis Coordinator communicates with clinical areas to answer questions and ensure appropriate processes are being followed (bundles, protocols, documentation) | | | | |
| Review data and ideas for improvement at team meetings. Do you have a way to know your data elements that fall out each month and a process for follow up? Do you have a process to address deviations from evidence-based care processes with physicians, nurses, and other clinical staff? | | | | |

| Components | Yes | No | NA | Action Plans (What, By Who, By When) |
|---|---|---|---|---|
| **Education** | | | | |
| Provider Education | | | | |
| Nursing Education | | | | |
| Support Staff Education | | | | |
| General Sepsis Education - all organization | | | | |
| Public / Patient Education | | | | |
| EMS Education | | | | |
| Other Healthcare Facility Education (LTC, Assisted Living) | | | | |
| Other Tools to enhance communication and ease of practice | | | | |
| Other Resources | | | | |

# Organizational Commitment / Team



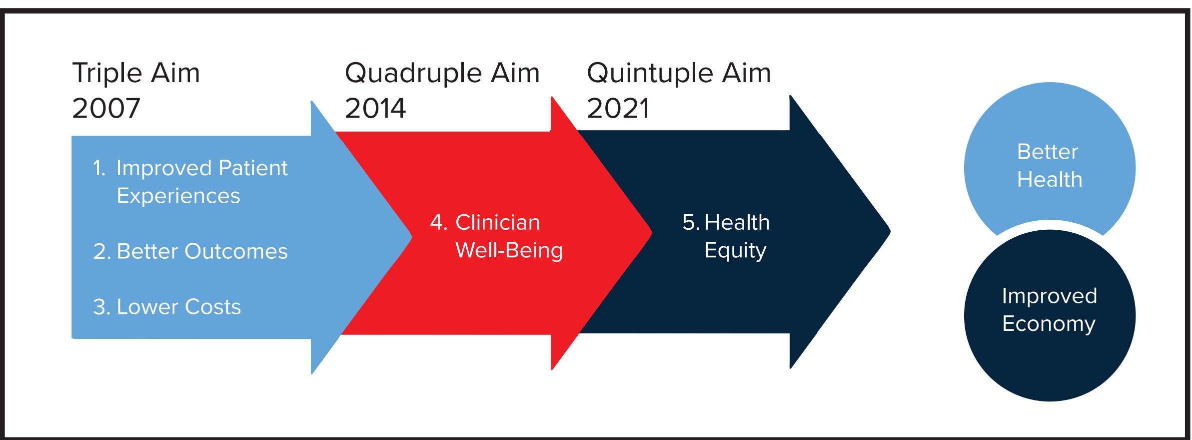
## Quintuple Aim

The Triple Aim is a framework developed by the Institute for Healthcare Improvement (IHI) in 2008. Over the past 14 years the framework has evolved and is now known as the Quintuple Aim as we continue to work towards achievement of the Triple Aim. Thought-leaders believe that the Triple Aim is not achievable without attention to health care burnout and inequity. Prioritization of the well-being of health care workers as a fourth aim will be necessary to fully achieve the Triple Aim through addressing workforce safety and satisfaction. With an overarching key to creating a better health-creating system for all, it becomes clear that the pursuit of health equity is fundamental to addressing all other aims.

Addressing equity as the fifth aim will drive improvement in population health, enhanced care experience, cost reduction, and improved workforce safety and well-being. Pursuing the five aims together is how to make progress on all of them.

Think of the Quintuple Aim as points on a star — a North Star that may guide our health system forward. There is connectivity between all the points. The aims are synergistic. They build upon one another. They are interdependent.

https://www.ihi.org/




## National Quality Strategy

The National Quality Strategy (NQS), published in March 2011 as the National Strategy for Quality Improvement in Health Care is led by the Agency for Healthcare Research and Quality (AHRQ) on behalf of the U.S. Department of Health and Human Services (HHS). The strategy's goals are to improve health and health care quality through synergy from all sectors, individuals, family members, payers, providers, employers, and communities, make it their mission.

The National Quality Strategy builds on the Institute for Healthcare Improvement's Triple Aim:

- Better Care: Improve the overall quality, by making health care more patient-centered, reliable, accessible, and safe.
- Healthy People/Healthy Communities: Improve the health of the U.S. population by supporting proven interventions to address behavioral, social and, environmental determinants of health in addition to delivering higher-quality care.
- Affordable Care: Reduce the cost of quality health care for individuals, families, employers, and government.

About the National Quality Strategy | Agency for Healthcare Research and Quality (ahrq.gov)

## The Financial Burden of Sepsis

The financial implications of sepsis for healthcare organizations are astounding.  The average annual marginal loss for sepsis care in large hospitals with more than 500 beds is $33.9 million and small hospitals with less than 200 beds average about $9.9 million.

| | **Large Hospitals (>500 beds)** | **Small Hospitals (<200 beds)** |
|---|---|---|
| **Sepsis Present on Admission** | | |
| Average Total Payment | $18.80 million | $5.64 million |
| Minimum-Maximum Payment | $14.6 million-$29.1 million | $4.4 million-$ 8.7 million |
| Net Margin Loss (Cost to Payment Differences) | $19.01 million | $5.6 million |
| **Sepsis Hospital-Acquired** | | |
| Average Total Payment | $5.36 million | $1.61 million |
| Minimum-Maximum Payment | $4.2 million-$8.3 million | $1.27 million-$2.49 million |
| Net Margin Loss (Cost to Payment Differences) | $14.83 million | $4.4 million |
| **Total** | | |
| Average Total Payment | $24.16 million | $7.25 million |
| Minimum-Maximum Payment | $18.8 million- $37.4 million | $5.67 million-$11.2 million |
| Net Margin Loss (Cost to Payment Differences) | $33.9 million | $9.90 million |

**Direct Costs:**

- Length of Stay
- Personnel Time
- Variable Costs (diagnostics, therapeutics, supplies)

**Indirect Costs:**

- Surveillance
- Reporting
- Quality Initiatives
- Delayed Treatment/Delayed Diagnosis or Misdiagnosis
- Disease Management

**Total costs:**

- In a large hospital, sepsis cases cost $37 million more than an equal number of non-sepsis cases.
- In a small hospital, sepsis cases have an incremental cost of $12 million.

**Readmission costs:**

- Readmission rates for sepsis are nearly 13%.
- Sepsis readmission cases cost large hospitals more than $4 million annually.

**Payment and margin:**

- Hospitals absorb 1.9 to 3.8 times the cost against reimbursement for sepsis care.
- Hospital-acquired sepsis at large hospitals has the highest cost to reimbursement ratio.

## Letter of Commitment Example

Month XX, 20XX

**Commitment to Creating an Effective and Efficient Sepsis Program:**
Enter Hospital Name

*ENTER HOSPITAL NAME*, Board of Directors, CEO, Executive team, and healthcare providers commit to creating a sepsis program within our organization that will provide high-quality, evidence-based sepsis care for all patients. This program will be supported with necessary resources to create an effective and efficient program that will best serve our patients.

Goals of the Sepsis Program will include, but are not limited to:

> Designating a Sepsis Leader that will coordinate the program and address successes and barriers. This person will also be responsible for communicating results of the program to quality leaders and others designated.
>
> Creating a multidisciplinary team that will address sepsis as a whole and allow collaborative care from all caregivers.
>
> Implementing evidence-based protocols and algorithms that will drive consistent, high-quality care in all areas.
>
> Assessing the effectiveness and gaps in care given in order to continuously improve the care that is given.

*ENTER HOSPITAL NAME*, commits to improving sepsis care for our Patients.

| ______________________ | ______________________ |
|---|---|
| CEO Signature | Date |
| ______________________ | ______________________ |
| Board Member Signature | Date |

### Potential Sepsis Team Members & Roles

| Team Member | Potential Role |
|---|---|
| Executive Leader | Encourages a culture of support and understanding |
| Quality Leader | Drives data collection and review to improve the quality of care |
| Nursing Leader | Understands the needs of caretakers to ensure that communication and education of nursing staff is effective. |
| Physician Champion | Drive medical decision making, educates all providers |
| Non-Physician Provider | Nurse practitioners and Physician Assistants are key players in healthcare and often plan a large role in rural communities |
| Frontline Nursing Staff | Help understand the formalization of the program into daily work |
| Laboratory | Brings specialized laboratory information |
| Pharmacy | Helps understand antibiotic options and medication protocols |
| Infection Preventionist | Brings expertise in the underlying infectious process |
| Care Management/Care Transitions | Ensure a plan is in place for patients following a sepsis diagnosis - decrease readmission potential or long-term deficit |

### Sample Sepsis Team Meeting Agenda

Enter Hospital Name

Team Members:

Date and Time of Meeting:

1. Review Minutes from the Previous Meeting: Ensure that each action item is addressed so that progress does not stall.

| Objective | Action Item | By Whom? By When? |
|---|---|---|
| 1. Set meeting schedule | Calendar request | Name, Due date |
| 2. Review all sepsis patient cases | Chart Review | Name, Due date |
| 3. Discuss outliers | Trend data, case study | Name, Due date |
| 4. Discuss successes / good catches | Trend data, case study | Name, Due date |
| 5. Sepsis Discharge plans / 30-day readmissions post-sepsis diagnosis | Readmission data review | Name, Due date |
| 6. Changes in evidence or care protocols | Information review | Name, Due date |
| 7. Education | Information Review | Name, Due date |
| 8. Items to share with your team | Create talking points to be reported | Name, Due date |

2. Ensure understanding amongst team regarding action items.

### Sepsis Data Collection:

Data should be used to understand the effectiveness of a Sepsis Program implementation or the improvement to a current Sepsis Program.

Important things to remember when collecting data:

- Collect baseline data using the same methodology and measurement (i.e.: date range, patient inclusion)
- Use data to drive decision-making – look at trends and outliers.
- Document date of initiative beginning so that improvement can be assessed and changes can be made as needed.
- BE CONSISTENT

### Baseline Data Collection Process:

- Pick time period for medical record query
- Sample size: minimum of 9 pts per unit or reveiw 100% if cases are <9

  Query strategies:

  - ICD 10 codes or DRG
  - Patients on 1-2 antibiotics, vasopressor (review charts to see if meet criteria for severe sepsis with lactate > 4 or septic shock before including in outcome data or process data)

Select Data Collection Elements – Outcome – Process

**Sep-1 Bundle:**

| | #1 | #2 | #3 | #4 | #5 | #6 | #7 | #8 | #9 |
|---|---|---|---|---|---|---|---|---|---|
| **Within 3 hours of presentation:** | | | | | | | | | |
| Serum Lactate (Initial Lactate) | | | | | | | | | |
| Blood Cultures Drawn (prior to AB) | | | | | | | | | |
| Administer Antibiotics | | | | | | | | | |
| Fluid resuscitation based on algorithm or order set<br>• or there is documentation that the provider requested allternitive fluid recessitation | | | | | | | | | |
| Assess volume status and perfusion assessment or documentation that supports differing fluid resuscitation order | | | | | | | | | |
| **Within 6 hours of presentation:** | | | | | | | | | |
| Repeat serum lactate if initial is> 2 | | | | | | | | | |
| Repeat volume status and perfusion assessment | | | | | | | | | |
| Vasopressor Administration (based on hypotension needs) | | | | | | | | | |

**Other data collection points:**

| | #1 | #2 | #3 | #4 | #5 | #6 | #7 | #8 | #9 |
|---|---|---|---|---|---|---|---|---|---|
| Full Set of Vital Signs per order set | | | | | | | | | |
| Cardiopulmonary Assessment | | | | | | | | | |
| Assess Cap Refill | | | | | | | | | |
| Peripheral pulse evaluation | | | | | | | | | |

**Rural ED Data Collection:**

| | #1 | #2 | #3 | #4 | #5 | #6 | #7 | #8 | #9 |
|---|---|---|---|---|---|---|---|---|---|
| Time to decision to transfer was <1 hour | | | | | | | | | |
| ED LOS < 3 hours | | | | | | | | | |
| Provider to Provider Hand-off with transferring facility | | | | | | | | | |

# Dedicated Sepsis Resources / Sepsis Coordinator / Lead

## Job Description: RN Sepsis Coordinator Template

Reports to: Chief Nursing Officer

### Job Summary:

The Sepsis Coordinator will be responsible for planning, implementing and coordinating services and activities associated with INSERT HOSPITAL NAME sepsis patients and programming. This role will be responsible for establishing and monitoring clinical performance criteria, assuring compliance with regulatory requirements, establishing or assessing effective treatment plans for sepsis patients including discharge disposition to ensure patients move to appropriate levels of care, and educating staff on evidence-based sepsis care.

### Duties:

- Coordinates the sepsis program at INSERT HOSPITAL NAME.
- Manages and coordinates sepsis patients during and post hospitalization.
- Facilitates sepsis community education work and events.
- Completes ongoing staff educational opportunities.
- Collects and analyzes ongoing data regarding treatment and outcomes of sepsis patients.
- Uses data to drive decision-making and process improvement.
- Submits required data to regulatory agencies.
- Performs and evaluates effectiveness of patient teaching.
- Maintains most current knowledge related to sepsis care.
- Resource to the organization for care of the sepsis patient.
- Reports and recognizes accomplishments.
- Addresses fallouts as they occur to ensure consistent high-quality care.

### Qualifications:

- Current Nebraska RN License
- Current BLS Certification

## Sepsis Mortality Reduction Project Charter

Project Title: Sepsis

Sponsor: Hospital Name

Facilitators: Sepsis Coordinator, Quality Improvement Leader

Project Start Date: XX/XX/XXXX

### Problem Statement:

Sepsis has a high mortality rate and a high rate of dysfunction post sepsis.

Team Members: Names and departments

### Project Scope:

The Sepsis Project includes Hospital Unit(s).

This project excludes certain patient type(s).

### Project Requirements:

Healthcare professionals will receive a straightforward protocol that can be consistently executed and changes strategies to improve the adoption of best practice.

### Goals:

To develop evidence-based project tools and organization-specific measures to reduce the occurrence and mortality of sepsis in the patient population by 10% across the organization. Furthermore, focused intervention measures with the sepsis patient will reduce progression of illness.

### Deliverables:

Best practice and guidelines for care

Screening tool(s) – to evaluate patients for sepsis

Order Set

Implementation plan

Staff Education

Data Gathering

Outcomes and Tools to measure outcomes

Process Improvement Ideas

# Identification / Screening

# Evolving Definition of Sepsis

| | Sepsis-1 (defined in 1991) | Sepsis-2 (revised in 2001) | Sepsis-3 (proposed 2016) |
|---|---|---|---|
| Sepsis | Infection + 2+ SIRS criteria* | Infection + Expanded diagnostic criteria | Infection + acute organ dysfunction (suggest 2+ SOFA) |
| Severe Sepsis | Sepsis-1 + acute organ dysfunction Sepsis-2 + acute organ dysfunction | Sepsis-2 + acute organ dysfunction | Not Recognized |
| Septic Shock | Sepsis + Hypoperfusion (SBP 4mmol/L) | Sepsis + hypoperfusion (SBP 4mmol/L) | Sepsis + hypotension + lactate > 2 |

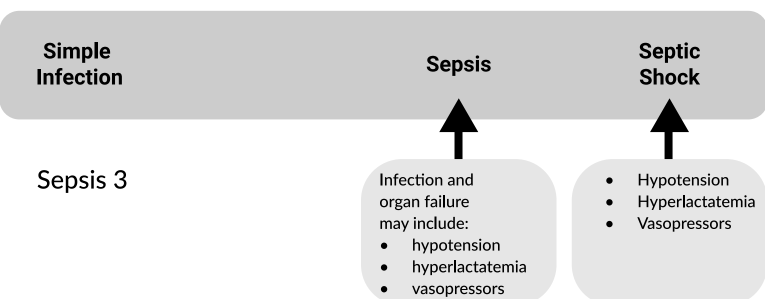
Simple Infection | Sepsis | Severe Sepsis | Septic Shock

Sepsis 2

SIRS criteria:
- Fever/hypothermia
- Tachycardia
- Tachypnea
- Leukocytosis/ leukopenia

Sepsis with:
- Organ failure
- or Hypotension
- or Hypoperfusion

Refractory hypotension




Sepsis 3 defined Sepsis as "life-threatening organ dysfunction caused by a dysregulated host response to infection." – leaving the opportunity for payers to not accept SIRs criteria only.

Sepsis 3 did not recognize severe sepsis and defined septic shock as a "subset of sepsis in which underlying circulatory and cellular metabolism abnormalities are profound enough to substantially increase mortality."

## Sepsis-1

Sepsis is a systemic inflammatory response in the presence of infection

SIRS criteria
- Temperature > 38°C or < 36°C
- Heart rate > 90/minute
- Respiratory rate > 20/minute (or PaCO, < 32 mmHg)
- WBC > 12,000/ul or < 4,000/ML (or > 10% immature bands)

## Sepsis-2

General signs and symptoms
- Fever (central temperature > 38.3°C)
- Hypothermia (central temperature < 36°C)
- Heart rate > 90/minute or > 2 SD above the normal value for age
- Tachypnea
- Edema or positive fluid balance (> 20 ml/kg 24 hours)
- Hyperglycemia (glycemia > 120 mg/dL) in the absence of diabetes

Inflammation markers
- Leukocytosis (> 12,000/wL) or leukopenia (< 4,000/uL)
- Normal leukocytes but > 10% immature bands
- Serum C-reactive protein > 2 SD above the normal value
- Plasma procalcitonin > 2 SD above the normal value

Hemodynamic variables
- Arterial hypotension (systolic < 90 mmHg, MAP < 70 mmHg, or systolic reduction > 40 mmHg in adults or < 2 SD of the normal value for age)
- SvO, < 70%
- Cardiac index > 3.5 L/min/m?

Indicators of organ dysfunction
- Arterial hypoxemia (Pa0 /FiO, < 300)
- Abnormal state of consciousness
- Acute oliguria (urine output < 0.5 mL/kg/hour)
- Elevated creatinine > 0.5 mg/dL
- Coagulation disorders (INR > 1.5/aPTT > 60 s)
- Thrombocytopenia (< 100,000/uL)
- Hyperbilirubinemia > 4 mg/dL or 70 mmol/L)

Indicators of tissue perfusion
- Hyperlactatemia (> 1 mmol/L)
- Reduced capillary refill and mottled skin

## Sepsis-3

**qSOFA**
- Respertory Rate > 22/Minute
- Systolic arterial pressure < 100mmHg
- Altered mentation

**Septic Shock**

Arterial hypotension requiring vasopressors to mainitain mean arterial pressure > 65mmHg and hyperlactatemia > 18mg/dl (2mmol/L) despite adequite vascular filling

SIRS - systemic inflammatory response syndrome: PaCO, - partial pressure of carbon dioxide: WBC - white blood cells; SD - standard deviation; MAP - mean arterial pressure; Svo, - venous oxygen saturation: PaOfFIO, - partial pressure of oxygen/traction of inspired oxygen: INR - international normalized ratio: aPT - activated partial prothrombin time.

# Sepsis Screening Tools

All sepsis screening tools have a level of subjectivity which means that each organization should choose a tool that works well for their workflow. Thorough training of staff and reliable use the tool is key to consistent outcomes.

Many payers are requesting more than one positive sepsis screening to pay for a claim with a sepsis diagnosis, most commonly the SIRS and qSOFA.

***Recommendations discourage using qSOFA as a single-screening tool for sepsis or septic shock.

## qSOFA – quick SOFA

### What is qSOFA?

A quick, bedside prompt that helps identify patients with a suspected infection who are at greater risk for a poor outcome outside the intensive care unit (ICU).

### When to Use qSOFA?

Patients >= 18 years old in a non-ICU setting with a confirmed or suspected infection.

- Simplified version of SOFA into 3 critical criteria that are easily assessed at bedside
- Can be repeated with changes in clinical condition
- Predicts mortality, as opposed to diagnosing sepsis

### Why Use qSOFA?

Simple way to help increase suspicion or awareness of a severe infectious process and prompt further testing and close monitoring.

### What are qSOFA criteria?

| | YES | NO |
|---|---|---|
| Altered Mental State (GCS < 15) | +1 | 0 |
| Respiratory Rate >=22 | +1 | 0 |
| Systolic Blood Pressure <= 100 | +1 | 0 |
| TOTAL | | |

### qSOFA Scoring:

**0-1 points =** Not High Risk: if sepsis is still suspected, continue to monitor, evaluate, and initiate treatment as appropriate, including qSOFA assessments.

**2-3 points =** High Risk: this score is associated with a 3-14 fold increase in mortality. Assess evidence of organ dysfunction with blood testing, including serum lactate and full SOFA Score.

# Sepsis Screening Tools

## MEWS (**M**odified **E**arly **W**arning **S**ystem)

| | 3 | 2 | 1 | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|---|---|
| **Respiratory Rate per minute** | | Less than 8 | | 9-14 | 15-20 | 21-29 | More than 30 |
| **Heart Rate per minute** | | Less than 40 | 40-50 | 51-100 | 101-110 | 111-129 | More than 129 |
| **Systolic Blood Pressure** | Less than 70 | 71-80 | 81-100 | 101-199 | | More than 200 | |
| **Conscious level (AVPU** | **U**nresponsive | Responds to **P**ain | Responds to **V**oice | **A**lert | New agitation Confusion | | |
| **Temperature (°C)** | | Less than 35.0 | 35.1 - 36 | 36.1 - 38 | 38.1 - 38.5 | More than 38.6 | |
| **Hourly Urine for 2 hours** | Less than 10mls / hr | Less than 30mls/hr | Less than 45mls/hr | | | | |

# Sepsis Screening Tools

**Modified Early Warning Score (MEWS)**

| | 4 | 3 | 2 | 1 | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| Temperature (°C) | <34 | 34.0-34.5 | 34.6-35.0 | 35.1-35.9 | DEVIATION FROM NORMAL RANGE | 38-38.4 | 38.5-39.9 | 40.0-40.4 | >40.4 |
| Systolic Blood Pressure (mmHg) | <90 | 90-99 | 100-110 | | | 150-169 | 170-189 | 190-200 | >200 |
| Pulse (bpm) | <45 | 45-49 | 50-54 | 55-60 | | 90-99 | 100-119 | 120-139 | >139 |
| Respiratory Rate (breaths/min) | <8 | 8-9 | 10-11 | | | 21-25 | 26-30 | 31-36 | >36 |
| Oxygen Saturations on Oxygen (%) | <88 | 88-91 | 92-95 | 96 | | | | | |
| Oxygen Saturations on Air (%) | <85 | 86-89 | 90-93 | 94-96 | | | | | |
| AVPU **OR** New CA | Pain response | | Voice response | | | | Confusion **OR** Agitation | | |
| Urine Output (mls/hr over 2 hrs) | <10 | | <20 | | | | >250 | | |

**Actions from MEWS**

| Score | Actions |
|---|---|
| <2 | Qualified nurse to review patient at next hand-over |
| 2-3 | Qualified nurse to review immediately<br>Repeat observations and instigate therapy as prescribed |
| 4-5 | Qualified nurse to review immediately<br>Repeat observations and instigate therapy as prescribed<br>**Junior Doctor to review within 30 minutes** |
| 6-7 | Qualified nurse to review immediately<br>Repeat observations and instigate therapy as prescribed<br>**Urgent review by SHO or StR immediately**<br>**PLUS**<br>**Inform Critical Care Outreach Team of patient** |
| 8 | Qualified nurse to review immediately<br>Repeat observations and instigate therapy as prescribed<br>**Urgent review by SHO or StR immediately**<br>**PLUS**<br>**Urgent review by Medical Emergency Team (MET) immediately** |

**AVPU =**

| | |
|---|---|
| A = | Alert |
| **V =** | Only responds to Voice |
| **P =** | Only responds to Pain |
| U = | Unresponsive |

**CA =**

| | |
|---|---|
| **C =** | Confusion |
| **A =** | Agitation |

Adapted from: MEWS used at Frimley Park Hospital NHS Foundation Trust

Identification / Screening

## Sepsis Screening Tools Cont.

There is no perfect tool. Choose one that works for your organization and use it consistently.

Ensure all staff are trained on the appropriate use and audit screening processes.

Screening should occur at least every shift and more frequently for high-risk patients.

### SIRS Criteria:

A positive screening = Occurrence of any two of the following:

| Temperature | Heart Rate | Tachypnea | WBC Count |
|---|---|---|---|
| <36°C (96.8°F) or >38°C (100.4°F) | >90 beats per minute | >20 breathes per minute or $PaCO_2$ <32 mm Hg | < 4,000/mm³ or > 12,000/mm³ or > 10% bands |

### SOFA: Sequential Organ Failure Assessment score (SOFA score)

The Sequential Organ Failure Assessment (SOFA) Score is a mortality prediction score that is based on the degree of dysfunction of six organ systems. The score is calculated on admission and every 24 hours until discharge using the worst parameters measured during the prior 24 hours.

| | | | | |
|---|---|---|---|---|
| $PaO_2/FIO_2$ (mmHg) or | <400 | <300 | <200 | <100 |
| $SaO_2/FIO_2$ | 221-301 | 142 - 220 | 67 - 141 | <67 |
| Platelets x 10³/mm³ | <150 | <100 | <50 | <20 |
| Bilirubin (mg/dL) | 1.2-1.9 | 2.0 - 5..9 | 1.2-1.9 | 1.2-1.9 |
| Hypotension | MAP < 70* | dopamine ≤5 or any dobutamine† | dopamine >5 or norepinephrine ≤ 0.1 | dopamine >15 or norepinephrine > 0.1 |
| Glasgow Coma Score | 13-14 | 10-12 | 6 - 9 | <6 |
| Creatine (mg/dL) or | 1.2 - 1.9 | 2.0 - 3.4 | 3.5 - 4.9 | > 5.0 |
| Urine output (mL/day) | | | <500 | <200 |

# Identifying Sepsis

There is no single confirmatory test – most patients with sepsis do NOT have positive blood cultures.

### Sepsis Definition Over Time:

Sepsis-1 Identified in 1991: "Sepsis represents the systemic inflammatory response to the presence of infection" with the following delineations:

- Sepsis: Infection + SIRS
- Severe Sepsis: Sepsis + organ dysfunction
- Septic Shock: sepsis + refractory hypotension

Sepsis-2 developed in 2001: Expanded list of possible diagnostic criteria, but otherwise no significant change to the framework.

Sepsis 3 developed in 2016 by a group of Critical Care Societies: States that sepsis is "life-threatening organ dysfunction caused by a dysregulated host response to infection"

- Use of SIRS was eliminated
- Severe Sepsis eliminated = became "sepsis"
- SIRS with infection = just plain infection – not sepsis
- Infection + increase in SOFA score by >= 2 points = Sepsis

### The Weakness of SIRS critera for definitive sepsis diagnosis:

- Non-specific for infection
- Some patients with severe infection and organ dysfunction do not manifest SIRS
- SIRS is physiologic organ dysfunction is what "crosses the line" between adaptive and maladaptive immune response

### Concerns with Sepsis 3 Definition:

- May delay treatment – setting back years of QI work
- SOFA is a complex beside assessment that may not be used accurately.

**Developing a Code Sepsis or Sepsis Alert Process:**

Develop criteria for alert to be called:

- 2 positive SIRs criteria and a positive qSOFA
- 2 positive SIRs criteria and a source of infection and / or organ dysfunction determined by lab values
    - Elevated lactate (>2.0 mmol/L)
    - Hypotension (SBP < 90 or MAP < 65 mmHg)

**Code Sepsis or Sepsis Alert Process:**

The goal of a rapid response to a potential sepsis is to mobilize all necessary team members and resources to the patient to expedite necessary care.

Potential Team Members:

- Laboratory
- Pharmacy
- Nursing Leaders, Frontline nursing staff
- Respiratory Therapy
- Provider / Hospitalist

If your organization has a Rapid Response Team or Bedside Assist Team in place Sepsis Alert could be included in their current process.

**Primary Care Team suspects or has a confirmed sepsis diagnosis**

**Any team member can initiate "Code Sepsis"**

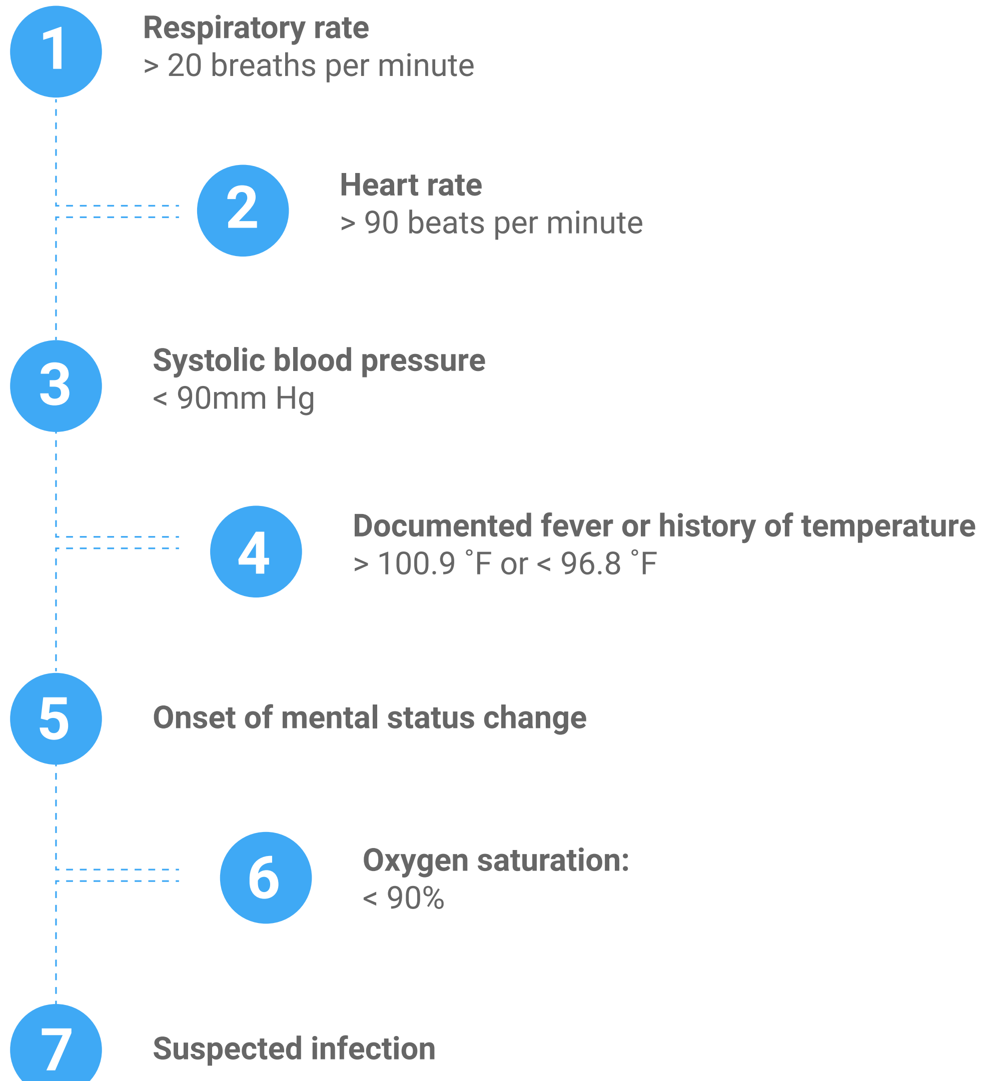
**Sepsis Team goes to bedside**

**Team members receive patient information from primary team and assist in treatment bundle**

## Additional Thoughts:

- Sepsis should be suspected anytime a patient with a known or suspected infection has new or worsening organ dysfunction.
- Clinicians should assess suspected sepsis patients immediately, sepsis can be subtle and patients may deteriorate rapidly.
- Sepsis Alert / Code Sepsis should bring additional hands to the patient and ability for rapid implementation of care.

**Pre-hospital Sepsis Screening and Alert:**




For many sepsis patients, EMS is the first point of medical contact when they become ill. Multiple studies have shown that EMS can play a role in faster antibiotic administration and initiation of time sensitive therapies, which reduces patient morbidity and mortality. This occurs through early screening and Emergency Department contact prior to patient arrival.

# Development of Nurse-Driven Sepsis Protocol

ADULT SEPSIS ASSESSMENT (≥18 years of age) and Physician Approved Sepsis Nursing Protocol

## PURPOSE

To use a standardized, physician approved, nursing assessment and protocol to assess and/or screen all adult patients ≥ 18 years of age for Sepsis, Severe Sepsis or Septic Shock and implement specified elements of the Severe Sepsis/Septic Shock treatment bundle as indicated. The physician approved sepsis nursing protocol will be implemented system wide for all qualifying inpatients ≥ 18 years of age.

## SCOPE

This health system protocol applies to Registered Nurses (RNs) only and includes the Emergency Department (ED) and inpatient population ≥ 18 years of age at ENTER HOSPITAL NAME.

## PROTOCOL

### Assessment

All patients ≥18 years of age will be screened/assessed for sepsis, severe sepsis, and/or septic shock upon triage to the Emergency Department (ED). Ongoing reassessment will occur in order to evaluate and/or update a patient's status to reflect changes as needed and to follow up with additional lab testing and/or treatment as warranted.

All inpatients ≥18 years of age will be screened/assessed/reassessed for sepsis, severe sepsis, and/or septic shock upon admission to all inpatient floors and/or units. Ongoing reassessment will occur throughout the hospitalization in order to evaluate and/or update a patient's status to reflect changes and additional treatment as needed. The adult sepsis assessment tool must be completed only by a Registered Nurse (RN). The completed sepsis assessment tool will be completed in the electronic medical record (EMR) and will become a permanent part of the patient's medical record.

### Criteria/Definitions

Systemic Inflammatory Response Syndrome (SIRS) = two (2) or more of the following:

• Temperature: <36°C or; >38°C

• Heart Rate: >90 beats per minute• Tachypnea: >20 breaths per minute or; PaCO  <32mm Hg

• WBC Count: < 4,000/$mm^3$ or; > 12,000/$mm^3$

Once a patient screens positive for Sepsis, the physician approved sepsis protocol should be implemented in the electronic medical record by the RN.

**Implementation**

All patients should receive:

- 2 peripheral IV sites, consider Central Line placement dependent on medication needs
- Vital Signs – frequency based on severity of illness and changes in status
- Cardiac Monitoring
- O2 to keep Oxygen Saturation > 90%

For all positive sepsis assessments, the RN will immediately initiate an electronic order to obtain the following labs:

Required for 6-hour bundle:

- Serum lactate level
- TWO (2) sets of blood cultures (to be obtained from two different sites); a total of 4 bottles
- Repeat lactate if initial lactate level is > 2

Additional Lab Tests:

- Procalcitonin
- CBC with Manual Diff
- Comprehensive Metabolic Panel
- PT/INR
- PTT

RN will immediately notify physician of positive sepsis assessment and request the following physician orders.

Physician may also order additional labs and/or tests or procedures as indicate:

- Broad-spectrum antibiotics, based on the adult sepsis order set, to be initiated within 1 hour of positive assessment
- IV fluid bolus of 30mL/kg to be initiated within 1 hour of time of presentation (TOP) and completed within 3 hours of time of presentation (TOP) – based on hypovolemic presentation

If a physician declines to order Broad Spectrum antibiotics and/or the required amount of IV fluid bolus, based on a positive sepsis assessment, the RN should document the following:

- Provider Name
- Reason(s) why Broad Spectrum antibiotics are not ordered for patient with sepsis
- Why IV fluid bolus of 30 mL/kg is not ordered for patient with sepsis.

The RN should request the physician assess the patient to confirm a positive sepsis assessment and/or to determine the need for transfer of patient to a more acute setting.

Once antibiotic(s) and/or fluids are ready for administration, RN will assure that the both sets of blood cultures (2 bottles each) have been drawn and then administer the first dose of antibiotic(s) and start fluids within one (1) hour of the time of positive sepsis assessment.

*NOTE: The RN should obtain lactate and collect blood cultures X 2 (4 bottles) prior to administering antibiotic(s), or prior to a change in antibiotic(s), following a positive sepsis assessment. The RN should not wait for lab results to administer the first dose of antibiotics or begin IV fluid bolus.

**Administration/Documentation**

The RN will administer antibiotic(s) and/or IV fluids as ordered by the physician. Administration of the antibiotic(s) and fluids must be documented in the patient's medication administration record. Blood cultures should be drawn prior to administration of antibiotics and documentation should reflect blood culture collection.

# Long Term Care SEPSIS SCREENING TOOL

## INFECTION

- Suspected or documented infection
- Antibiotic therapy

## SIRS – Systemic Inflammatory Response Syndrome

- Temperature greater than or equal to 100.4° F or less or equal to 96.8° F
- Heart rate greater than 90 beats/minute
- Systolic blood pressure less than 90 mmHg

***If less than two checked = NEGATIVE screen for sepsis. Initials_____**

***If 2 above are checked, PATIENT SCREENED POSITIVE FOR SEPSIS; alert the nurse who will:**

- Place resident on I & O.
- Monitor and record urine output every shift.
- Obtain order for LACTIC ACID and proceed to Organ Dysfunction.

## ORGAN DYSFUNCTION

- Respiratory: SaO2 less than 90% OR increasing O2 requirements
- Cardiovascular: SBP less than 90 mmHg or 40 mmHg less than baseline
- Renal: Urine output less than 30ml/hr or less than 240ml/8 hrs
- CNS: Mental status changes
- LABS: (Do not use lab results older than 24 hours.)
- Platelets less than 100,000
- INR greater than 1.5
- Bilirubin >/= 2 mg/dl
- Serum lactic acid greater than or equal to 2 mEq/l

***If 1 above checked, PATIENT SCREENS POSITIVE FOR SEVERE SEPSIS. CALL PROVIDER.**

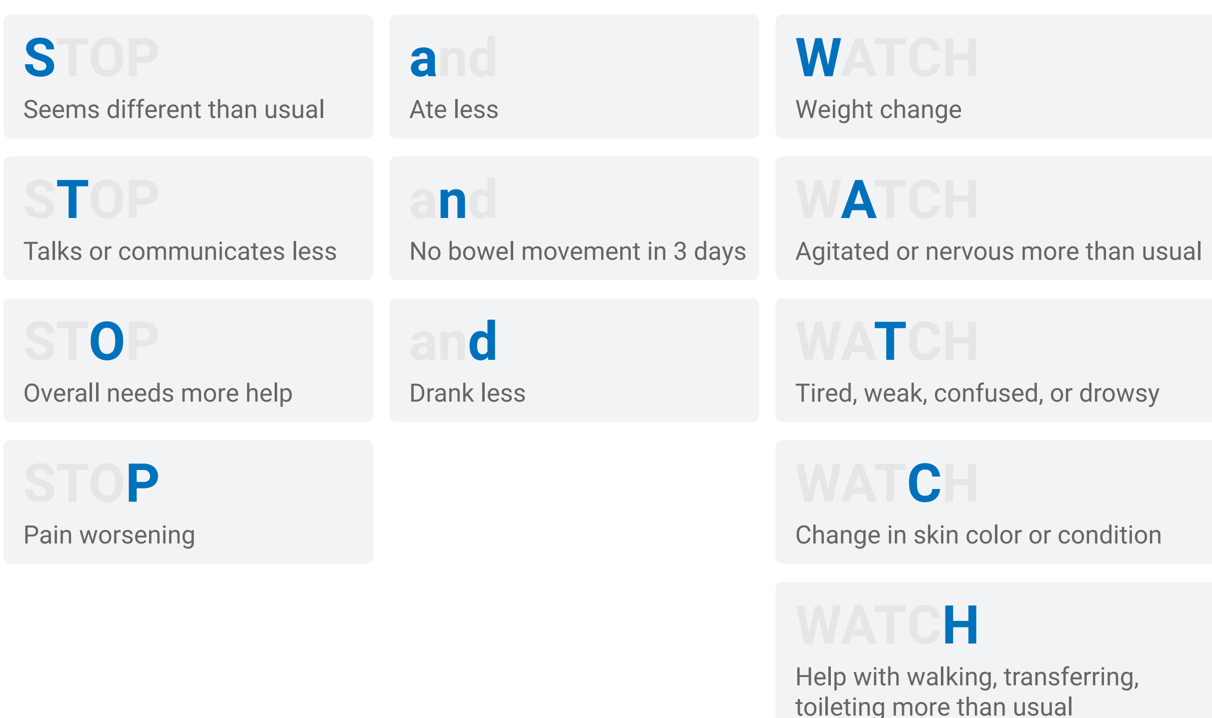
***If no checks above = NEGATIVE screen for sepsis. Initials______**

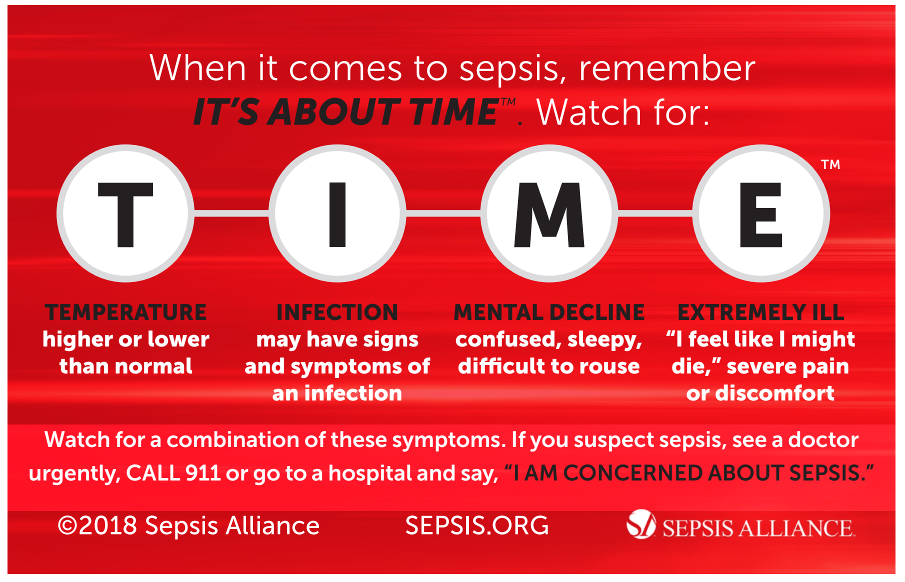
Continue to assess every 2-4 hours.

## USING YOUR SENSES TO IDENTIFY SEPSIS

**EYES**: Look for skin redness, swelling, discharge, decreased urination
**EARS**: Listen for complaints of pain, chills and/or breathing
**TOUCH**: Feel for a warm wound, fast pulse, hot, cold or clammy skin
**SMELL**: Check for odor from wound, urine and/or breath
**TASTE**: Is there a decreased appetite?

## STOP AND WATCH (INTERACT)



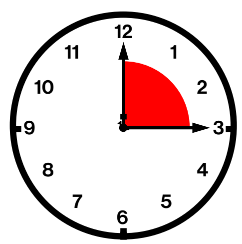



# Treatment / Implementing the Bundles

## CMS Sepsis Bundles:

Patients should receive ALL of the following within 3 hours of presentation (time zero) of severe sepsis:

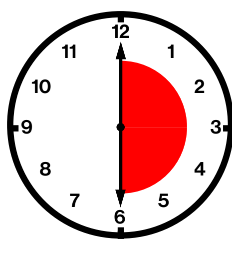
- Initial lactate level measurement
- Blood cultures drawn prior to antibiotic administration
- Broad spectrum or other antibiotics administered



## SEP - 1: Three-Hour Bundle

AND within 3 hours of initial hypotension OR within 3 hours of septic shock:

- Resuscitation with 30 mL/kg crystalloid fluids
- OR – provider documentation that states medical reason for not meeting fluid resuscitation requirements



## SEP - 1: Six-Hour Bundle

AND Patients should receive ALL of the following within 6 hours of presentation (time zero) of severe sepsis, ONLY if the initial lactate is elevated(>= 4 mmol/L):

- Repeat lactate level measurement
- ONLY if hypotension persists after fluid administration:
    - Vasopressors are administered – to maintain a mean arterial pressure (MAP) of >= 65 mmHg
- If hypotension persists after fluid administration or initial lactate >= 4 mmol/L:
    - Repeat volume status and tissue perfusion assessment and document findings

## Complications of COVID-19 and Sepsis

There is a two-way association between sepsis and COVID-19 (sepsis increases the risk of COVID-19, and vice versa). A significant risk factor for both conditions is a compromised immune system.

People with weakened immunity are more likely to get infections, including COVID-19. And people with compromised immune systems are more likely to have severe COVID-19.  Septic shock can be a complication of critical cases of COVID-19.

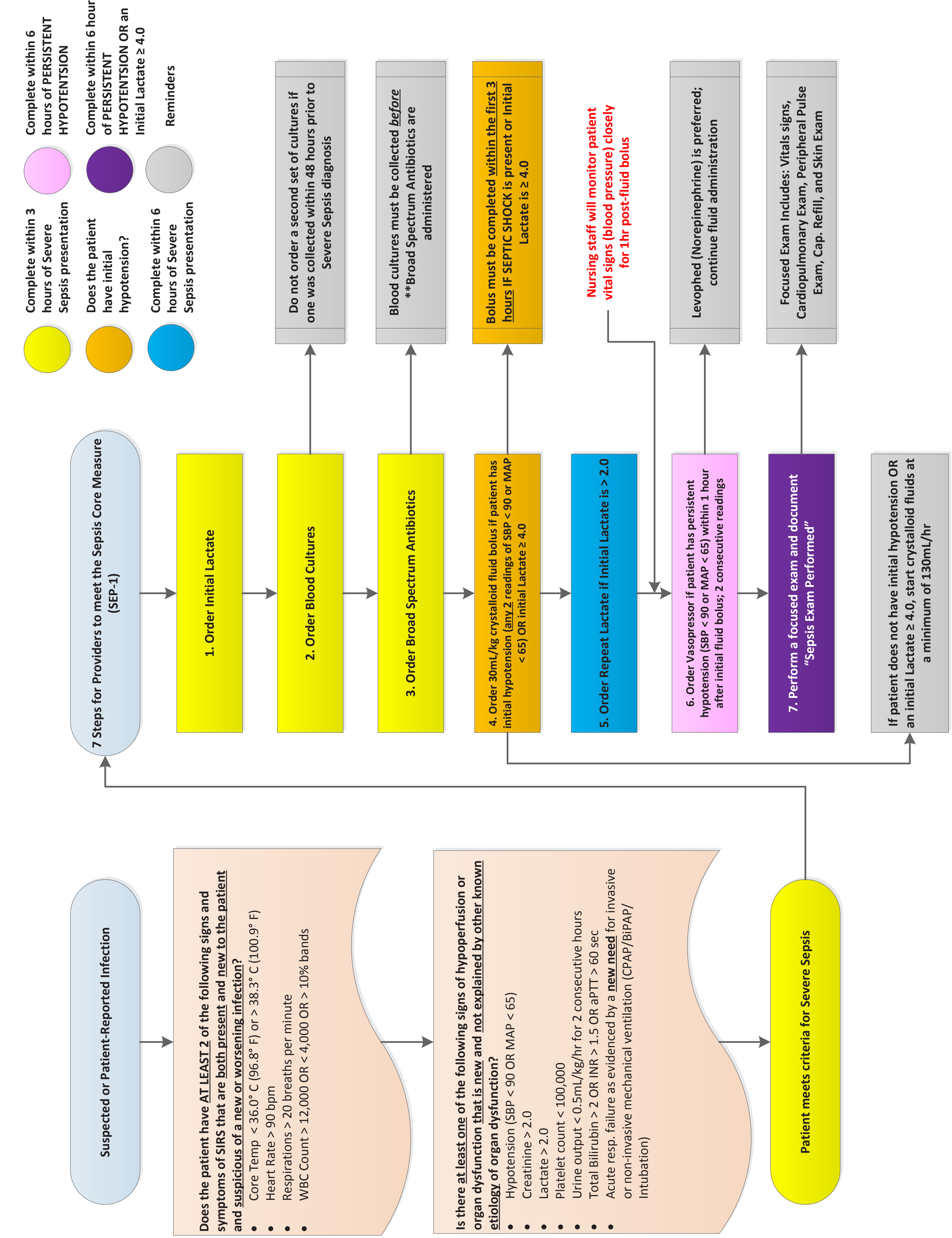
While bacterial infections are the leading cause of sepsis, viruses, such as SARS-CoV-2, can also lead to sepsis.  COVID-19 and sepsis share complications, including hypoxia, chronic renal failure, and coronary heart disease.

A compromised immune system following sepsis could increase the risk of long-term COVID-19 complications as immune system dysregulation and may lead to long-term COVID-19 infection, also known as long COVID.  This highlights the importance of prevention and treatment of COVID-19 to reduce the risk of living with long-term complications.

*** Patients that have a positive sepsis diagnosis along with a documented positive COVID-19 principle or other diagnosis (Code of U07.1)

# SEPSIS Algorithm

Courtesy of Mary Lanning Healthcare



# seeing sepsis Skilled nursing facility sepsis algorithm for adults

**Suspected infection *and* 2 or more SIRS criteria**

| Suspected infection | SIRS criteria |
| --- | --- |
| Fever/chills | Temp ≥100.0 or ≤96.8 |
| Currently on antibiotics | Pulse ≥100 |
| Cough/SOBS | BP <100 or >40 mmHg from baseline |
| Cellulitis/wound drainage | Resp. rate >20/SpO2 <90% |
| Weakness | Altered mental status |

SIRS = Systemic Inflammatory Response Syndrome

**Early detection tool 100-100-100**

NO → **Negative screen for sepsis**

YES → **Positive screen for sepsis**

**Prior to calling provider**

- **Educate resident/family about status**
- **Review Advance Directives and options**

**Notify provider**

**Transfer**

- Prepare transfer sheet
- Call ambulance
- Call report to hospital
- *Report positive sepsis screen*

**Stay in facility**

***If Advance Directives and/or resident's wishes are in agreement, consider some or all of following order options:***

- Labs: CBC w/Diff, lactate level (if possible), UA/UC, blood cultures if able; from 2 sites, not from lines. *Send all labs ASAP.*

Establish IV access for the following:

- IV normal saline 0.9% @ 30ml/kg if BP <100
- Administer IV, IM or PO antibiotics
- Comfort care

**Monitor for progression into *Multisystem Organ Dysfunction Syndrome***

Examples:

- Progression of symptoms despite treatment
- Urine output <400ml in 24 hours
- SBP <90 despite IV fluids
- Altered mental status

Consider transferring to another level of care - hospital, palliative, or hospice

**Comfort care**

- Pain control
- Analgesic for fever
- Reposition every 2-3 hrs
- Oral care every 2 hrs
- Offer fluids every 2 hrs
- Keep family informed
- Adjust care plan as needed

Courtesy of Minnesota Hospital Association

Courtesy of Bryan Health

# Time Zero

*time zero is recognition time: for the ED that is triage completion time; see tips

## 3 Hour Bundle

*everything in this bundle must be completed prior to 3 hours after time zero

**Lactate drawn** ☐ *repeat in 4 hours if > 2.0

**Blood Cultures drawn** ☐ 2 sets - can be drawn concurrently with 2 separate venipunctures

**Antibiotic delivery** ☐ *goal all antibiotics initiated within 1 hour of order time

______________________

______________________

______________________

______________________

**Fluid Resuscitation Bolus** ☐ *30ml x ______Kg = _____ Total Fluids
*For SBP < 90; MAP < 70; Lactate > 4.0

## 6 Hour Bundle

*everything in this bundle must be completed prior to 6 hours after time zero

**Addition of vasopressors** ☐ *Norepinephrine preferred

**Repeat lactate** ☐ *If initial >2

**Central line insertion** ☐

**Monitor CVP** ☐

**Monitor ScV02** ☐

Not a Part of the Patient's Record send to Sepsis Coordinator or __________ in Organizational Quality

Courtesy of Bryan Health

# Sepsis Tips

"Time Zero" is defined as the time of earliest chart annotation consistent with all elements of severe sepsis, or septic shock ascertained through chart reviews. If unknown, may use: Triage Completion time for ED; time of arrival for direct admits with sepsis; sepsis BPA time; BRRT time; Time orders are first received.

## 3 Hour Bundle

- Utilize Sepsis order set and Sepsis STAT Antibiotics
- 2 sets of Blood cultures should be drawn PRIOR to antibiotic delivery
  - If this delays antibiotic delivery notify provider and DOCUMENT THE ORDER
  - Cultures need to be drawn peripherally
    - If the provider suspects a central line infection, they may request a blood culture from the line – you will need a **physician order** to obtain cultures from a central line
    - If unable to collect a peripheral set of cultures, obtain a **physician order** to collect the sample from central access.
  - ED Nurses CANNOT draw blood cultures from a peripheral IV start
- Lactates are the dark green tube and need to be on ice
- ALL ANTIBIOTICS must hit the body within 1 hour of order time AND within 3 hours from time zero
- Fluid resuscitation is defined as **30 ml/kg** crystalloid (Normosol/Plasma-Lyte,NS) bolus initiate ASAP
  - For SBP < 90; MAP < 70; Lactate > 4.0
  - A *bolus* is defined as 1 liter over **30 minutes (ICU/ED) or 60 min (other acute care areas)** some situations may require faster administration. If so, consider transfer to ICU.
  - If provider makes the medical decision not to follow fluid resuscitation guidelines – document medical reason in the chart.

## 6 Hour Bundle

- If hypotension persists, start a vasopressor. Norepinephrine is the preferred vasopressor.
  - Requires adequate fluid resuscitation to be successful
  - Norepinephrine gtt starts at 0.02 mcg/kg/min for sepsis. Titrate by 0.01 or 0.02 mcg/kg/min q 5 min to goal MAP > 65
- If initial lactate > 2, a repeat needs to be drawn. The repeat lactate needs to be completed within **6 hours** from **time zero**
- Centrally inserted central line *preferred* for a patient in shock
- A repeat assessment of volume status and tissue perfusion is required for patients with septic shock. Measure CVP and ScV O2 (lab drawn from distal port) – these can be obtained from a PICC as well

# CODE SEPSIS CHECKLIST

## *Inpatient OB Unit* Early Recognition

| | |
|---|---|
| **Date:**____________________________________<br>**Patient's Room Number:**__________________ | ***TIME ZERO:**__________________<br>***Time Zero Inpatient:** Any two of signs identified + Attending confirms suspicion for infection |

*Recommended Best Practices*

| | Any two SIRS symptoms below | AND Suspected infection? | |
|---|---|---|---|
| | HR>110 — Temp < 36 ***OR*** between 38- $38.9^0$C<br>RR>20<br>SBP<90 — WBC > 14 ***OR*** <4<br>FHR >160 — Acute Change in Mental Status<br>Any isolated Temp of $39^0$ Notify MD | Yes ➔ | 1. **Call Rapid Response Team** unless MD is available for immediate assessment and orders<br>2. RRT initiates Sepsis NIO ( nurse initiated orders) |
| | | No ➔ | Continue to monitor patient |

| | **To be completed in ONE HOUR (from TIME ZERO)** | |
|---|---|---|
| | While waiting for MD to arrive on floor, RRT RN to facilitate implementation as applicable | **Result/Time/Initials** |
| 1 | ☐ **Call Lab stat** to draw:<br>☐ **Lactate level stat** | Draw Time(set 1)_____<br>Draw Time(set 2)_____ |
| 2 | ☐ **Blood Cultures x 2 stat**<br>*(Before antibiotic, but do not delay antibiotics if unsuccessful with blood draw)* | |
| | ☐ **NS or LR Bolus** 500mL (wide open) [Fluid ordered:________________] | |
| | **Primary RN**: Recheck VS every 15 mins x 2 from completion of bolus. If SBP <90 or MAP < 65.<br>***IF VS stable****, repeat full set of VS every 1 hour x2; if patient deteriorates, call RRT and provider for further directions).*<br>*(If* ***patient remains hypotensive*** *after bolus, start discussion with provider about CCU admission and further fluid bolus of 30mL/kg.* | |
| 3 | ☐ **IV Antibiotic** *(Get order from MD.* ***Start by hour 1 from TIME ZERO*** *)*<br>☐ **Antibiotic start time:** ________________________________ | |
| | ☐ **Notify MD of lactate level result** and **obtain verbal order** for repeat lactate and further fluid bolus | |
| | **To be completed by HOUR 3 (from TIME ZERO)** | |
| 4 | ☐ **NS or LR 30mL/kg Fluid Bolus.** (If septic shock present)<br>Total calculated volume to infuse (mL/Pt weight (kg) _______ x 30mL = _________ | Time completed:_____<br>Total given: _________ |
| | **To be completed by HOUR 4 (from TIME ZERO)** | |
| 5 | **Repeat Lactate 4 hours** after first, if first lactate is >2<br>Repeat Lactate due: _______________(Date) at _______________(Time)<br>(Lactate level-Critical Value = >4.0) MD Notified: ___________ | Draw Time: ________<br>Result:________ |
| 6 | **Consider Vasopressors** if with remains hypotensive after 30mL/kg bolus. | Time: _________ |
| | ☐ Page MD **for fluid status reassessment** after completion of 30mL/kg bolus OR 4 hours of time ZERO.<br>*(MD reassessment required 4 hours after start of fluid resuscitation)* | Fluid resuscitation (Start time): _______<br>Time MD page: ____ |
| 7 | **Attending: Document Reassessment of Fluid Status After Resuscitation (FOCUS 5)** | Time: ______________ |

4_2018 OB SPECIFIC Version 10

## Using procalcitonin (PCT) to aid in the diagnosis and monitoring of sepsis

*PCT levels < 0.5 µg/L do not exclude an infection, localized infections (without systemic signs) may be associated with such low levels.

Reference range: In apparently healthy people, plasma PCT concentrations are found to be > 0.1 µg/L

PCT Levels must always be interpreted in the context of laboratory findings and clinical assessments

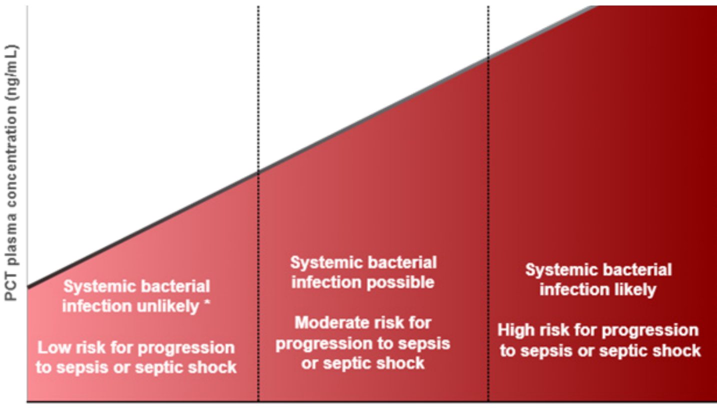
PCT insight for likelihood of bacterial infection and risk for progression to sepsis or septic shock

PCT levels > 2.0 µg/L indicate a high probability of systemic bacterial infection and risk for progression to sepsis or septic shock.

PCT levels < 0.5 µg/L indicate a low likelihood systemic bacterial infection and low risk of progression to sepsis or septic shock.

Note: These cut-offs differ from those for patients with acute lower respiratory tract infections (LRTIs).

Trending PCT levels may help determine if the patient status is improving or declining. It is important to measure PCT levels at the first sign of infection to help determine both severity of illness and adequacy of source control.




| PCT < 0.10 ng/mL | **Healthy individuals/non-infected patients.*** |
|---|---|
| PCT < 0.50 µg/L | **Systemic infection (sepsis) not likely. Local bacterial infection is possible.*** Low risk for progression to severe systemic infection (sepsis). Caution: PCT levels below 0.5 ng/mL do not exclude an infection, because localized infections (without systemic and signs) may be associated with such low levels. Also, if the PCT measurement is done very early after following bacterial challenge (usually less than six hours), these values may still be low. In this case, procalcitonin should be reassessed 6 to 24 hours later. |
| ≥ 0.5 - <2.0 µg/L | **Systemic infection (sepsis) possible, but various other conditions are known to induce PCT as well.*** Moderate risk for progression to severe systemic infection (sepsis). The patient should be closely monitored both clinically and by reassessing procalcitonin within 6 to 24 hours. |
| PCT ≥ 2.0 µg/L | **Suggestive of the presence of bacterial infection.*** Systemic infection (sepsis) likely, unless other causes are known.* High risk for progression to severe systemic infection (sepsis). |

- PCT levels below 0.5µg/L do not exclude an infection, because localized infections (without systemic signs) may also be associated with such low levels.
- If the PCT measurement is done very soon after the systemic infection process has started (usually <6 hours), values may still be low.
- The PCT reference ranges are valuable guidelines for the clinician but they should always be interpreted in the context of the patient's clinical condition.
- Antibiotic treatment should be started or continued on suspicion of infection, particularly in high-risk patients.

*PCT values may be elevated in certain medical conditions independent of bacterial infection. Decisions regarding antibiotic therapy should NOT be based solely on procalcitonin concentrations.

Courtesy of Bryan Health

# Sepsis Tips

**Pregnancy and Sepsis Screening:**

- Algorithm will ask if patient is Pregnant 20 Weeks through 3 days Post-Partum.
  - If the patient is Pregnant 20 weeks through 3 days SIRS Criteria is adjusted:

| Non-Pregnant Criteria | Pregnant 20 weeks through Day 3 Post-delivery Criteria |
|---|---|
| Temperature >38.3 C or < 36 C (>100.9 F or < 96.8 F) | Temperature ≥38 C or < 36.0 C (>= 100.4 F or < 96.8 F) |
| Heart rate > 90 | Heart rate > 110 |
| Respiration > 20 per minute | Respiration > 24 per minute |
| White blood cell count >12,000 or 10% bands | White blood cell count >15,000 or 10% bands |

  - If the patient is Pregnant 20 weeks through 3 days Organ Dysfunction Criteria is adjusted:

| 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 |
| Creatinine >2.0 mg/dL | Creatinine >1.2 mg/dL |
| 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 |

**Other Abstraction Tips:**

Do not use an elevated INR, aPTT, or PTT values as organ dysfunction if the medical record documentation shows the patient received an anticoagulant medication in Appendix C Table 5.3 before the elevated INR, aPTT, or PTT value. Physician/APN/PA documentation is not required. Use the elevated INR, aPTT, or PTT value if the patient only received Heparin flushes.

If the SIRS criteria or a sign of organ dysfunction is due to the following, do not use it. Do not make inferences. The abnormal value or reference to the abnormal value must be in the same documentation (i.e., same sentence or paragraph):

- Normal for that patient
- Is due to a chronic condition
- Is due to a medication
  - Examples: "Chronic A-fib with RVR"
  - Do not use the heart rate readings >90 since the chronic condition is in the same sentence

Select Value "8" ("UTD") if the medical record states only that the patient is being "discharged" and does not address the place or setting to which the patient was discharged.

If the lactate >2 mmol/L (18.0 mg/dL) was obtained during active delivery, do not use it, select Value "1."

- For purposes of the measure, active delivery is determined by documentation of uterine contractions resulting in cervical change (dilation or effacement) through delivery or childbirth.

## SEPSIS Treatment Tool for Emergency Departments/Handoffs

Courtesy of Nebraska Methodist Health System

# SEPSIS

| Patient Label | Location: | **Sepsis Alert**<br>Date:<br>Time: | Provider Notified ☐<br>(Name, Date, Time) | **Sepsis Advisor Time** |
|---|---|---|---|---|

**Complete in 3 Hours**

| | | |
|---|---|---|
| ☐ | Initial Lactate Drawn | |
| ☐ | Blood Cultures Drawn x2 | Before antibiotic administration<br>**Do not delay antibiotic if unable to obtain**<br>-If unable to draw B.C. before antibiotic list why in notes |
| ☐ | Broad Spectrum Antibiotics Administered:<br>1st antibiotic given within 1 hour (order stat) | Med: |
| ☐ | 2nd Antibiotic Administered<br>(does not always require 2nd antibiotic) | Med: |
| ☐ | 30mL/kg crystalloid IVF Bolus<br>If hypotensive or original lactate > 4mmol/L | Start / End / Total Amount Given: |

Weight used for fluid amount: Actual Weight Ideal Body Weight

☐ Fluids Charted

**Complete in 6 Hours**

| | | |
|---|---|---|
| ☐ | Repeat Lactate 4-6 hours from initial lactate | If Initial Lactate >2 |
| ☐ | Vasopressors Started | If hypotension persists after fluid administration (MAP <65mm/Hg) |
| ☐ | Repeat Volume Status and Tissue Perfusion Assessment | If Septic Shock presentation:<br>Hypotension after fluid administration or initial lactate >=4mmol/L |

Notes:

**INPATIENT**

| Suspected Infection Source Site:<br>(New or Worsening) | RRT Called<br>Yes / No | Possible Sepsis?<br>Yes / No | Transferred Y / N<br>Where: |
|---|---|---|---|

**Sepsis Alert Triggers:**

SIRS (2 or more):

Organ Dysfunction:

# SEPSIS: Definitions and Resource

| | |
|---|---|
| Sepsis | Defined as: life-threatening organ dysfunction caused by a dysregulated host response to infection<br>*In other terms*: a life-threatening condition that arises when the body's response to an infection injures its own tissues and organs. |
| Septic Shock | Defined as: a subset of sepsis in which underlying circulatory and cellular metabolic abnormalities are profound enough to substantially increase mortality.<br>Sepsis with persisting hypotension requiring vasopressors to maintain a MAP>= 65mm Hg and having a serum lactate level >2mmol/L despite adequate volume resuscitation. |
| Time Zero | Starts when Sepsis is identified or Sepsis alert fires |
| Repeat Volume Status and Tissue Perfusion Assessment: | Focused exam—Physician/APRN/PA note must include physical exam of perfusion (reperfusion)<br>Example: "Sepsis re-evaluation was performed", or physical exam including perfusion.<br>NICOM (PLR or Bolus), CVP, ScvO2 |

**SIRS (Systemic Inflammatory Response Syndrome)**

Two or more of:
- Temperature >38.3°C or <36.0°C (>100.9°F or < 96.8°F)
- Heart rate >90/min
- Respiratory rate >20/min or $PaCO_2$ <32 mm Hg (4.3 kPa)
- White blood cell count >12 000/$mm^3$ or <4000/$mm^3$ or >10% immature bands

**Organ Dysfunction**

- SBP<90mmHg or MAP<65
- Creatinine >=2.0 and increase of 0.5mg/dL over 72 hours
- Billirubin >=2.0 and =<10.0mg/dL
- Platelet count <100,000 $uL^{-1}$
- INR >1.5
- Lactate > 2.0mmol/L
- Respiratory Failure (e.g. vent, BiPAP)

| qSOFA: (Quick SOFA) | |
|---|---|
| Respiratory rate ≥22/min | 1 |
| Alerted Mentation | 1 |
| Systolic blood pressure ≤100 mm Hg | 1 |
| Total score of 2 or 3 = increased Mortality Risk | |

**SOFA: (Sepsis-Related) Organ Failure Assessment Score**

| System Score: | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| **Respiration**<br>$PaO_2/FiO_2$, mmHg | >=400 | <400 | <300 | <200 with respiratory support | <100 with respiratory support |
| **Coagulation**<br>Platelets, x$10^3$/uL | >=150 | <150 | <100 | <50 | <20 |
| **Liver**<br>Bilirubin, mg/dL | <1.2 | 1.2-1.9 | 2.0-5.9 | 6.0-11.9 | >12.0 |
| **Cardiovascular** | MAP >=70mmHg | MAP <70mmHg | Dopamine<5 or dobutamine | Dopamine 5.1-15 or epinephrine =<0.1 or norepinephrine =< 0.1 | Dopamine >15 or epinephrine >0.1 or norepi-nephrine => 0.1 |
| **Central Nervous System**<br>Glascow Coma Scale Score | 15 | 13-14 | 10-12 | 6-9 | <6 |
| **Renal**<br>Creatinine, mg/dL<br>Urine output, mL/day | <1.2 | 1.2-1.9 | 2.0-3.4 | 3.5-4.9<br><500 | >5.0<br><200 |
| A score of 2 or higher in any system indicates organ dysfunction and an elevated risk of mortality. | | | | | |

*Sepsis Treatment Tool Template courtesy of Amber Fuller DNP, APRN, NP-C, Methodist Hospital. Omaha, NE*

## SEPSIS Treatment Tool

Courtesy of Nebraska Methodist Health System

# SEPSIS

| Patient Label Location: | **Sepsis Alert**<br>Date:<br>Time: | Provider Notified ☐<br>(Name, Date, Time) | **Sepsis Advisor Time** |
|---|---|---|---|
| Suspected Infection Source Site: (New or Worsening) | RRT Called | Possible Sepsis? | Transferred Y / N |

| **Sepsis Alert Triggers:**<br>SIRS (2 or more):<br>Organ Dysfunction: | NEWS ALERT SCORE |
|---|---|

| | | | |
|---|---|---|---|
| **qSOFA** (outside of the ICU) | Date: | Time: | Result: |
| **SOFA** (ICU patients) | Date: | Time: | Result: |

| To be Completed within 3 hours | | | |
|---|---|---|---|
| | **Date** | **Time** | |
| ☐ Initial Lactate Drawn | | | Result: |
| ☐ Blood Cultures Drawn x2<br>Before antibiotic administration do not delay antibiotic administration if unable to obtain blood cultures.<br>-If unable to draw B.C. before antibiotic please list why in notes section. | | | Result: |
| ☐ Broad Spectrum Antibiotics Administered:<br>1st antibiotic given within 1 hour (order stat)<br>1. | | | |
| ☐ 2.<br>(does not always require 2nd antibiotic) | | | |
| ☐ 30mL/kg crystalloid IVF Bolus<br>If hypotensive or original lactate > 4mmol/L<br>Weight used for fluid amount: ☐ Actual ☐ Ideal Body Weight | | Start:<br>End: | Total Given ☐ Total Charted ☐ |
| **To be Completed within 6 Hours** | | | |
| ☐ Repeat Lactate 4-6 hours from initial lactate<br>If Initial Lactate >2 | | | Result: |
| ☐ Vasopressors Started<br>If hypotension persists after fluid administration (MAP <65mm/Hg) | | | Medication: |
| ☐ Repeat Volume Status and Tissue Perfusion Assessment<br>If Septic Shock presentation:<br>Hypotension after fluid administration or initial lactate >=4mmol/L | | | Method:<br>Documented by: |

Notes:

| | |
|---|---|
| Sepsis | Defined as: life-threatening organ dysfunction caused by a dysregulated host response to infection<br>*In other terms*: a life-threatening condition that arises when the body's response to an infection injures its own tissues and organs. |
| Septic Shock | Defined as: a subset of sepsis in which underlying circulatory and cellular metabolic abnormalities are profound enough to substantially increase mortality.<br>Sepsis with persisting hypotension requiring vasopressors to maintain a MAP>= 65mm Hg and having a serum lactate level >2mmol/L despite adequate volume resuscitation. |
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| SIRS (Systemic Inflammatory Response Syndrome) |
|---|
| Two or more of:<br>•Temperature >38.3°C or <36.0°C (>100.9°F or < 96.8°F)<br>•Heart rate >90/min<br>•Respiratory rate >20/min or $Paco_2$ <32 mm Hg (4.3 kPa)<br>•White blood cell count >12 000/$mm^3$ or <4000/$mm^3$ or >10% immature bands |

| Organ Dysfunction | |
|---|---|
| •SBP<90mmHg or MAP<65 | •Platelet count <100,000 $uL^{-1}$ |
| •Creatinine >=2.0 and increase of 0.5mg/dL over 72 hours | •INR >1.5 |
| | •Lactate > 2.0mmol/L |
| •Billirubin >=2.0 and =<10.0mg/dL | •Respiratory Failure (e.g. vent, BiPAP) |

| qSOFA: (Quick SOFA) | |
|---|---|
| Respiratory rate ≥22/min | 1 |
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| Total score of 2 or 3 = increased Mortality Risk | |

| SOFA: (Sepsis-Related) Organ Failure Assessment Score | | | | | |
|---|---|---|---|---|---|
| System Score: | 0 | 1 | 2 | 3 | 4 |
| **Respiration**<br>$PaO_2/FiO_2$, mmHg | >=400 | <400 | <300 | <200 with respiratory support | <100 with respiratory support |
| **Coagulation**<br>Platelets, x$10^3$/uL | >=150 | <150 | <100 | <50 | <20 |
| **Liver**<br>Bilirubin, mg/dL | <1.2 | 1.2-1.9 | 2.0-5.9 | 6.0-11.9 | >12.0 |
| **Cardiovascular** | MAP >=70mmHg | MAP <70mmHg | Dopamine<5 or dobutamine | Dopamine 5.1-15 or epinephrine =<0.1 or norepinephrine =< 0.1 | Dopamine >15 or epinephrine >0.1 or norepi-nephrine => 0.1 |
| **Central Nervous System**<br>Glascow Coma Scale Score | 15 | 13-14 | 10-12 | 6-9 | <6 |
| **Renal**<br>Creatinine, mg/dL<br>Urine output, mL/day | <1.2 | 1.2-1.9 | 2.0-3.4 | 3.5-4.9<br><500 | >5.0<br><200 |
| A score of 2 or higher in any system indicates organ dysfunction and an elevated risk of mortality. | | | | | |

Singer M, Deutschman CS, Seymour CW, et al. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). *JAMA.* 2016;315(8):801–810. doi:10.1001/jama.2016.0287

Sepsis Treatment Tool Template courtesy of Amber Fuller DNP, APRN, NP-C, Methodist Hospital. Omaha, NE

## Severe Sepsis – Septic Shock Checklist

Date: ________________

Time Zero Severe Sepsis:______________________Time Zero Septic Shock: ____________________

Time ED Code Sepsis Paged:___________________Time RRT Paged (inpatient): ___________________

**Severe sepsis:** known or suspected infection plus 2 or more SIRS plus new organ dysfunction (see screening tool)

| Initials | Date and Time | **Sign, Date and Time Below** **Nurse to complete ALL Interventions as quickly as possible and within 3 hours or less from time zero** |
|---|---|---|
| | | **Physician Order:** Obtain orders for Severe Sepsis Bundle |
| | | **IV Access:** Obtain 18 gauge or larger if possible<br>☐ Attempted but unable to obtain |
| | | **Lactate Sent:** Send initial lactate stat if not done already, call stat<br>☐ Attempted but unable to obtain specimen<br>INITIAL LACTATE RESULT: |
| | | **Blood Cultures Sent:** Obtain prior to antibiotics – send 2 sets from peripheral sites DO NOT DELAY ANTIBIOTICS more than 30 min to get BC if difficult stick<br>☐ Attempted to draw blood cultures prior to antibiotics, unable to obtain specimen |
| | | **IV Antibiotic Given STAT:** DO NOT HOLD ANTIBIOTICS if going to OR, give now<br>GOAL: Give 1st antibiotic within 1 hour of severe sepsis (give Vanco 2nd due to infusion time required)<br>**Date and time** of each antibiotic that was started within 3 hours<br>**Cefepime 2g**____________**Zosyn 4.5g**_______________Vanco (if ordered give 2nd) __________________<br>**Cipro 400mg**____________**Ceftriaxone 2g**____________Other(s):_________________________________ |
| | | **Initial IV Fluid Bolus Completed:**<br>Administer 30 mL/kg 0.9% Sodium Chloride or lactated Ringers bolus for a lactic acid level ≥ 4 (regardless of BP) or SBP < 90mmHg or MAP < 65mmHg<br>RAPIDLY INFUSE entire bolus amount over 1 hour<br>Monitor for improvement in BP, HR, urine output, etc.<br>Document BOLUS START TIME<br>WEIGHT – BASED BOLUS AMOUNT:<br>Actual Weight in kg: x 30ml =_____ml<br>☐ **START TIME DOCUMENTED IN EMR** |
| | | **Repeat Lactate Sent:** SEND IMMEDIATELY AFTER IVF BOLUS if initial lactate was > 2.<br>If transferred before recheck:<br>INFORM ACCEPTING RN UPON HANDOFF OF NEED TO SEND REPEAT LACTATE<br>☐ Attempted to draw blood but was unable to obtain.<br>REPEAT LACTATE RESULT: |
| | | **Post-Bolus Vital Signs Recorded:**<br>Minimum of 2 full sets VS (including TEMP) recorded: **IMMEDIATELY** and **15 min** AFTER IVF BOLUS completed<br>☐ VS CHARTED IN EMR (if SBP < 90 or MAP < 65 we need VS q30 min times 4 hours) |
| | | **The next 2 items to be completed for patients meeting SEPTIC SHOCK criteria** (within 6 hours of time zero): severe sepsis plus SBP less than 90mm/HG or 40mm/HG decrease from baseline after initial fluid bolus or requires vasopressors OR INITIAL lactate 4 or more regardless of SBP |
| | | **Vasopressors Applied:** Required if hypotensive (SBP < 90mmHg or MAP < 65 mmHg) despite IVF bolus of 30mL/kg<br>Requires physician order – Norepinephrine is 1st choice OR Not required – hypotension not present |
| **Initials** | | **RN Signature** |
| **Initials** | | **RN Signature** |
| **Initials** | | **RN Signature** |
| | | **Medical Provider Documented Post IVF Bolus Shock Re-Assessment Exam:**<br>I have completed a focused sepsis exam.<br>Date exam was performed:______________________Time exam was performed: ________________________<br>Provider Signature: ___________________________________________________________<br>Provider Printed Name: ________________________________________________________<br>OR check 2 of the following:<br>☐ Measure CVP ☐ Bedside cardiovascular ultrasound *<br>☐ Measure ScvO2 ☐ Passive leg raise or fluid challenge*<br>*Please document findings in a progress note |

Severe sepsis checklist template courtesy of Pat Posa RN, BSN, MSA, CCRN-K, FAAN, St. Joseph Mercy Hospital, Ann Arbor, Mich.

## SEPSIS Transfer Driver Diagram

**SEPSIS TRANSFER DRIVER DIAGRAM**

| | Primary Drivers | Secondary Drivers | |
|---|---|---|---|
| **Optimal Transfer of Sepsis Patient from CAH/ Rural to Regional Hospital** | Create a Partnership | • Identify facility that you transfer or receive sepsis patients from and contact sepsis or ED leader<br>• Arrange a face to face visit<br>• Arrange a visit to "walk in their shoes"<br>• Develop a partnership between CAH Rural & Regional Facility<br>• Establish agreement for screening, treatment/order sets, roles & responsibilities for both facilities | Change Ideas |
| | Implement Reliable and Valid Early Detection Processes for Sepsis | • Screen every patient in ED triage with a standard sepsis evaluation tool | Change Ideas |
| | | • Monitor sepsis screening processes for reliability and validity | Change Ideas |
| | Implement 3-hr Bundle for patients who screen positive for sepsis: | • Draw lactate ASAP and ensure that the results are available within 45 minutes<br>• Implement processes that ensure the ready availability of blood culture draws so that blood cultures can be drawn before starting antibiotics<br>• Administer broad spectrum antibiotics (goal is within 60 minutes)<br>• Administer fluid bolus 30ml/kg for patients with hypotension or lactate equal to or > than 2mmol/L | Change Ideas |
| | Communicate Status of Treatment | • Communicate to regional facility & EMS status of treatment | Change Ideas |
| | Continue Treatment throughout Transport | • Ensure treatment continues during transport<br>• Develop transfer orders that support fluid administration during transport | Change Ideas |
| | Create learning loop | • Provide regular feedback between CAH Rural facility and referral facility regarding identification, treatment, and status of the patient | Change Ideas |

SPRING 2018

Pt. Identifier

# ICU Admission Orders - Severe Sepsis Bundle

Page 1 of 4

**STATUS INPATIENT:** See *Initial Order Set - Patient Status* already completed by MD
☐ **Transfer to SICU** ☐ **Transfer to CICU** ☐ **Transfer to CVICU** ☐ **Transfer to ICU**

**DIAGNOSIS:**

☐ Consult/Notify (if already involved) Infectious Disease Physician ____________ to see: STAT / TODAY / IN AM
☐ Consult Dr. ____________ re: ____________ to see: STAT / TODAY / IN AM
☐ Consult Dr. ____________ re: ____________ to see: STAT / TODAY / IN AM
**Consult Therapy:** ☐ Physical ☐ Occupational ☐ Wound re: ____________

**ALLERGIES/ PRECAUTIONS:**
**If Allergic to PCN/Cephalosporin or carbapenem - Reaction:**
___ Anaphylaxis/Breathing difficulties ____ Urticaria ___ Delayed Rash ___ Unknown ____ Other
**Reaction investigated** & Patient may receive Cephalosporin or Carbapenem: ____ Yes _____ No

**CODE STATUS:** ☐ See DNR Order ☐ Full Code

**NURSING:**
☑ **Vital Signs** Q 1 hr with continuous pulse oximetry
☑ **Call MD** for **SBP** < (90) _____ or > (180) ______; **DBP** < (40) _____ or > (100) ________;
**HR** < (50) _____ or > (120) ______; **RR** > (30) _____; **Temp** > (101) ________;
**O2 sats** < (90%) __________on ______; **Urine Output** < (1cc/kg/hr) _________
☑ **Vascular Checks** Q (4) _____ hr
☑ **Neuro Checks** Q (4) _____ hr
☑ Delirium Assessment Q shift
☑ **Activity :** Bedrest **with** HOB ≥30 unless contraindictated ☐**:** ____________
☑ Initiate the ICU Pressure Ulcer Prevention Protocol (includes daily weights)
☑ Strict I & O: ☐ Place Foley Catheter with drainage to gravity
☑ Oral Care Q2hr ☐ Lacrilube to both eyes Q4hrs and PRN
**Diet:** ☐ **NPO** ☐ **Clear Liquid** ☐ **NPO x ice chips** ☐ **Regular** ☐ ____________
☑ Consult Registered Dietitian (RD) for nutrition management per RD
☑ RD may modify/manage diet order and/or enteral nutrition per approved MNT protocol
☐ **OG/NG:** ☐ continuous low suction or ☐ clamped/check residuals Q4hr
☑ Initiate Gastric Residual Volume Algorithm

**GLUCOSE MANAGEMENT:**
☑ Initiate **"ICU Blood Glucose Treatment Protocol"**
☑ Initiate Hypoglycemia protocol if BG < 70 and notify MD

**RESPIRATORY**
☐ Nasal Cannula AND/OR ☐ Face Mask at _____ L/min or _____FiO2
☐ Wean for SpO2 ≥ 92 %
☐ Initiate "Bronchodilator Protocol" ☐ Initiate "NonInvasive Ventilation Assistance Protocol"

**MECHANICAL VENTILATION**
Mode ____________
Rate _______ breaths/min TV ________ cc
PEEP _______ cmH2O
Pressure Support _______cmH2O
FI02 _________ titrate to a Sp02 ≥ 92%

☑ ABG 30 minutes after initial settings
☑ ABG PRN acute respiratory distress (notify MD of results)
☑ Daily Assessment per the Weaning From Mechanical Ventilator Protocol
☑ Notify MD for: ____________

**MD Signature:** **Date:** **Time:**

**RN Signature:** **Date:** **Time:**

Pt. Identifier

# ICU Admission Orders - Severe Sepsis Bundle



**SEDATION / ANALGESIA FOR MECHANICAL VENTILATION:**

- DO NOT ADMINISTER ANY OF THE BELOW **INFUSIONS** IF PATIENT IS EXTUBATED
- ALL INFUSION ORDERS WILL EXPIRE AFTER 72 HOURS; PHYSICIAN MUST REWRITE
- Maintain level 3-4 on the modified Ramsey sedation scale (MRSS) Q2h and document
- Wean to a MRSS of 2 at least Q 24hrs; Assess neurological status & weaning ability
  Restart infusion at half of previous dose and titrate to desired MRSS
- Notify MD for MAP < 65mmHg or if unable to maintain sedation within dosage range

**SEDATION: (select one)**

☐ **Propofol infusion** at 5 micrograms/kg/minute

- Titrate by 5 micrograms/kg/min Q 5min to maintain ordered MRSS (Max of 50micrograms/kg/minute)
- Change tubing Q 12hrs
- Serum triglyceride level at start of infusion and Q 72hrs while on propofol (notify MD if triglycerides > 300 mg/dL)

**OR**

☐ **Lorazepam** 1-2mg IV Q 2hrs PRN to maintain ordered sedation
**NOT to be used for patients s/p craniotomy**

**ANALGESIA:**

☐ **Morphine** 1 -2 mg IV Q1h PRN mild pain; 3-4 mg IV Q1h PRN moderate pain; 5 mg IV Q1h PRN severe pain
**NOT to be used for patients s/p craniotomy**

**OR**

☐ **Fentanyl** 12.5 – 50 micrograms IV Q 1 hrs PRN pain;
mild (1-3) = 12.5 micrograms; mod (4-7) 25 micrograms; severe (8-10) = 50 micrograms

**VTE RISK AND PREVENTION: HIGH RISK**

☑ Bilateral Sequential Compression Devices **– SCDs** (all patients)
☐ **Enoxaparin** (Lovenox) 40 mg SQ Q 24hr
☐ **Heparin** 5000 units SQ Q 8hr
☐ Anticoagulation Contraindicated because**:** ☐High risk of bleeding
☐On therapeutic anticoagulation
☐Other:
☐ Consult Anesthesiology: indwelling/epidural catheter regarding timing of prophylactic anticoagulation

**STRESS ULCER PROPHYLAXIS**

**Enteral feedings:** ☐ Pepcid (famotidine) 20mg via GI Tube q12h (if CrCl <50mL/min Q24h)
☐* Protonix (Pantoprazole) 40 mg / 20 mL suspension via OG Daily **(*PPI)**
**No enteral feedings:** ☐ Pepcid (famotidine) 20mg IV q12h (if CrCl <50mL/min Q24h)
☐ *Protonix (pantoprazole) 40mg IV daily (*PPI)

**<u>*Proton Pump Inhibitors (PPI) carry a greater risk of C difficile infection</u>**

**ADRENAL INSUFFICIENCY OF CRITICAL ILLNESS**

☐ **Cosyntropin stimulation test**

- Obtain baseline serum cortisol level
- Administer **Cosyntropin** 250mcg **IV** over 2 minutes
- Obtain serum cortisol level 60 minutes after Cosyntropin administration
- **Call MD** with results of Cortrosyn stimulation

**PROBIOTICS:**

☐ **Lactobacillus (Bacid) one caplet** PO / PT Q12 hrs

**MISC:**

**MD Signature:** **Date:** **Time:**

**RN Signature:** **Date:** **Time:**

Pt. Identifier

# ICU Admission Orders - Severe Sepsis / Septic Shock Bundle

Page 3 of 4

**Labs**

- ☐ Blood Cultures x 2 Stat – one may be drawn from central line
- ☐ UA and Urine Culture
- ☐ Sputum GS and Culture if possible
- ☐ CBC w/Diff
- ☐ Phosphorous
- ☐ CK/CK-MB & Troponin I STAT then Q ____ hrs x ____
- ☐ CMP
- ☐ Mg
- ☐ Lactate level
- ☐ PTT, PT/INR
- ☐ Ionized Calcium
- ☐ Legionella UAT
- ☐ Type and Screen
- ☐ ABG
- ☐ Pneumococcal UAT
- ☐ TSH, free T3, free T4
- ☐ BNP
- ☐ Influenza A and B rapid test

**AM Labs/Imaging:**

☐ CBC ☐ BMP ☐ Fasting Lipid Panel

☐ Portable CXR - Indication: ______________________

☐ ________________________________________

**Imaging / Cardiac:**

☐ **ECG 12 Lead STAT**

☐ **2-D Echo** with color Doppler (read by _________________)

**Indication:** ________________________________

☐ **Portable CxR Indication:** ______________________

**Nursing Instruction:**

☑ If Lactate Level ≥ 2 - repeat lactate level in 4 hrs and in AM and notify MD

**Maintenance Fluids**: IV of ________________ @ __________ mL/hr

**Fluid Resuscitation for Hypoperfusion (SBP < 90 or MAP < 65) <u>OR</u> a Lactate level > 4 mmol/L**

- ☐ Give 0.9% Normal Saline _______ mL IV over ______ min
- ☐ If SBP remains < 90 mmHg or MAP <65 mmHg, Give additional ______ mL 0.9% Normal Saline IV over ______ min

**Hemodynamic Monitoring:**

- ☑ **If CVP in place**- Measure CVP Q1 hr and after each fluid bolus
  Notify MD for CVP < _____ mmHg
- ☑ **If PA catheter in place** – Measure PAP, CO, SVR Q 2hrs, then Q4hrs when stable
  Notify MD for ________________________

**Clinical Decision Support:**
**Sepsis Bundle Recommendation:**

Without clinical contraindication - Administer 30mL/kg crystalloid for SBP < 90 mmHg <u>OR</u> MAP < 65mmHg <u>OR</u> lactate > 4mmol/L

Refer to *"RSFH ICU Guideline on Hemodynamic Monitoring in Shock"* for recommendations

**Vasopressors for Hypoperfusion that does not respond to Fluid Resuscitation:**

☐ **Begin Norepinephrine** 8mg/250mL D5W

- ☑ Starting dose 2mcg/min
- ☑ Titrate 2mcg/min Q 5 minutes to maintain SBP >90mmHg or MAP ≥ 65mmHg
- ☑ **Notify MD➔** if patient requires ≥ 50mcg/min
- ☑ Draw Random serum Cortisol level **if Norepinephrine titrated to > 12 mcq/min**
  If random serum cortisol level is **< 18 mcg/dL, Notify MD**

**If Additional agent is needed to maintain SBP or MAP:**

☐ **Begin Epinephrine** 4mg/250mL D5W <u>OR</u> ☐ maximize concentration to 8 mg/ 250mL D5W

- ☑ Starting dose _______mcg/min
- ☑ Titrate 0.1 mcg/kg/min Q 5 min to maintain SBP > 90mmHg or MAP ≥ 65mmHg
- ☑ **Notify MD➔** if patient requires ≥ _____ mcg/kg/min

☐ **Begin Vasopressin** 100 units / 250 mL NS

- ☑ Starting dose _____ units /min
- ☑ Maximum dose 0.04 units/min for hemodynamic support
- ☑ Maximum dose 0.8 units/min for GI Bleed

| **MD Signature:** | **Date:** | **Time:** |
|---|---|---|
| **RN Signature:** | **Date:** | **Time:** |

# ICU Admission Orders –
# Severe Sepsis Initial Empiric Antibiotics

Patient Identifier





| Suspected Source of Sepsis | First Line Therapy | Alternative Therapy (Due to Allergy or Resistance) |
|---|---|---|
| ❑ Community Acquired Pneumonia | ☐ Ceftriaxone 1g IV Q 24h + Azithromycin 500mg IV Q 24h **OR** ☐ Ceftriaxone 1g IV Q 24h + Levofloxacin 750mg IV Q 24h | ☐ Aztreonam 2g IV Q 8h + Levofloxacin 750mg IV Q 24h |
| | ❑ If MRSA suspected ADD to the above Vancomycin 20mg/kg IV Q12h (max 2 g) | |
| ❑ Community Acquired Pneumonia with risk for Pseudomonas *COPD and chronic steroids, COPD and repeated antibiotic exposure, or Bronchiectasis | ☐ Piperacillin/tazobactam 4.5g IV Q 8h + Levofloxacin 750mg IV Q 24h **OR** ☐ Piperacillin/tazobactam 4.5g IV Q 8h + Azithromycin 500mg IV Q 24h | ☐ Aztreonam 2g IV Q 8h + Levofloxacin 750mg IV Q 24h |
| | ❑ If MRSA suspected ADD to the above Vancomycin 20mg/kg IV Q12h (max 2 g) | |
| ❑ Nosocomial Pneumonia (HAP/VAP/HCAP) | ☐ Cefepime 2g IV Q8h + Ciprofloxacin 400mg IV Q8h<br>☐ Cefepime 2g IV Q8h + Tobramycin 7mg/kg IV Q 24h<br>☐ Piperacillin/tazo 4.5g IV Q 8h + Ciprofloxacin 400mg IV Q 8h<br>☐ Piperacillin/tazo 4.5g IV Q 8h + Tobramycin 7mg/kg IV Q 24h | ☐ Aztreonam 2g IV Q 8h + Levofloxacin 750mg IV Q 24h |
| | ❑ If MRSA suspected ADD Vancomycin 20mg/kg IV Q12h (max 2 g) **OR**<br>❑ Linezolid 600 mg IV Q12h (P&T restricted use: ID and Pulm/Critical Care specialists only) | |
| ❑ Community acquired Urinary Tract | ☐ Ceftriaxone 1g IV Q 24h | ☐ Aztreonam 1g IV Q 8h + Levofloxacin 750mg IV Q24h<br>☐ Levofloxacin 750mg IV q24h + Tobramycin 7mg/kg IV q24h |
| ❑ Nosocomial Urinary Tract | ☐ Cefepime 2g IV q8h | ☐ Aztreonam 1g IV Q 8h + Levofloxacin 750mg IV Q24h<br>☐ Levofloxacin 750mg IV q24h + Tobramycin 7mg/kg IV q24h |

## "ICU Sepsis"

Appropriate initial empiric therapy of complicated intra-abdominal infection, central catheter infection, complicated soft tissue infection (diabetic SSTI, post-op wound), neutropenic fever, or sepsis of unknown source. Selections guided by RSFH antibiograms of inpatient cultures.

**First Line Therapy**
- ☐ Piperacillin/tazobactam 3.375g IV Q 8hrs (over 4hrs)

**History of rash to penicillin**
- ☐ Cefepime 2g IV Q 8h

**History of anaphylaxis to penicillin**
- ☐ Aztreonam 2g IV Q 8h + Levofloxacin 750mg IV Q24h
- ☐ Levofloxacin 750mg IV q24h + Tobramycin 7mg/kg IV q24h

**If expanded gram negative coverage needed, ADD**
- ☐ Tobramycin 7mg/kg IV Q 24h

**If MRSA suspected, ADD**
- ☐ Vancomycin 20mg/kg IV Q 12h (max. dose 2g)

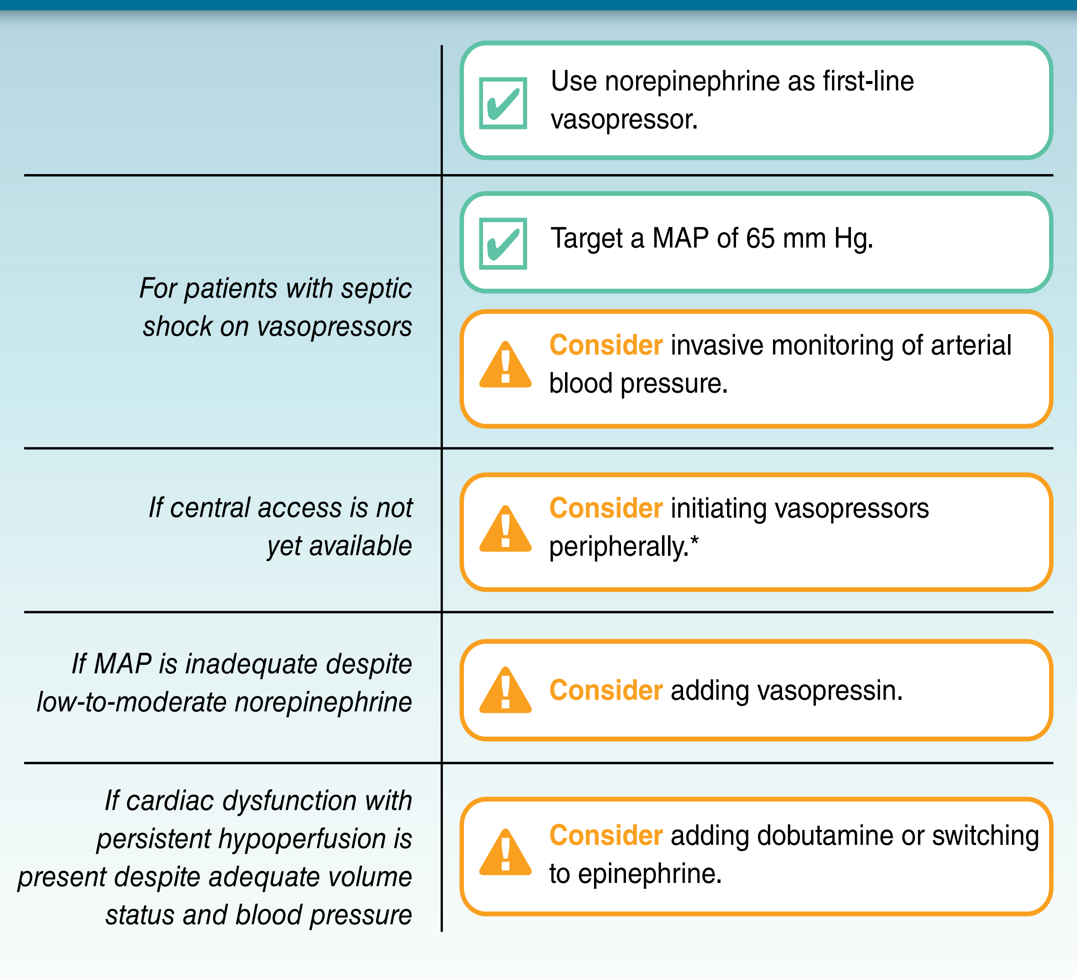
**ADD anaerobic coverage for intra-abdominal, complicated GU, diabetic SSTI if unable to use piperacillin/tazobactam**
- ☐ Metronidazole 500mg IV Q 8h

**For necrotizing fasciitis ADD**
- ☐ Clindamycin 900mg IV Q 8h

☐ Pharmacist to adjust antibiotics per protocol until discontinued
☐ Pharmacist to manage vancomycin and/or aminogylocoside therapy until discontinued
☐ Aminoglycoside Drug levels: ☐ 8-10hrs random post 1st dose ☐ Peak/Trough – 3rd dose ☐ Random @ ______
☐ Vancomycin Drug level as follows: ☐ Trough prior to 4th dose ☐ Random @ ______
Actual body weight will be used for aminoglycoside dosing unless patient > 120% IBW, then dosing weight will be used

| MD Signature: | Date: | Time: |
|---|---|---|
| RN Signature: | Date: | Time: |

# Vasoactive Agent Management



| Situation | Recommendation |
| --- | --- |
| | Use norepinephrine as first-line vasopressor. |
| *For patients with septic shock on vasopressors* | Target a MAP of 65 mm Hg. |
| | **Consider** invasive monitoring of arterial blood pressure. |
| *If central access is not yet available* | **Consider** initiating vasopressors peripherally.* |
| *If MAP is inadequate despite low-to-moderate norepinephrine* | **Consider** adding vasopressin. |
| *If cardiac dysfunction with persistent hypoperfusion is present despite adequate volume status and blood pressure* | **Consider** adding dobutamine or switching to epinephrine. |

- *Strong recommendations are displayed in green*
- *Weak recommendations are displayed in yellow.*

**When vasopressors are used peripherally, they should be administered only for a short period of time and in a vein proximal to the antecubital fossa.*

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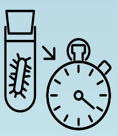
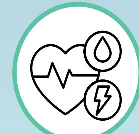
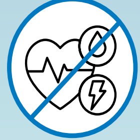
Surviving Sepsis Campaign®

# Antibiotic Timing

|  |  Shock is present |  Shock is absent |
|---|---|---|
| **Sepsis is definite or probable** | Administer antimicrobials ***immediately***, ideally within 1 hour of recognition. | Administer antimicrobials ***immediately***, ideally within 1 hour of recognition. |
| **Sepsis is possible** | Administer antimicrobials ***immediately***, ideally within 1 hour of recognition. | Rapid assessment* of infectious vs. noninfectious causes of acute illness. |
| | | Administer antimicrobials ***within 3 hours*** if concern for infection persists. |

**Rapid assessment includes history and clinical examination, tests for both infectious and noninfectious causes of acute illness, and immediate treatment of acute conditions that can mimic sepsis. Whenever possible, this should be completed within 3 hours of presentation so that a decision can be made as to the likelihood of an infectious cause of the patient's presentation and timely antimicrobial therapy provided if the likelihood is thought to be high.*

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# Discharge Planning / Decreased Readmissions

# Readmissions and Sepsis

A study published in 2019 found that 17.5% of sepsis survivors were readmitted to the hospital within 30 days of their initial discharge, with over half occurring within the first 2 weeks and one-third occur within the first 7 days.

The most common reasons for readmissions are new or reoccurring infections:

- Pneumonia
- Skin and soft-tissue infections
- Catheter-related infections
- C. difficile infections

Children are also affected by readmissions with more than 20% of children who survive sepsis being readmitted within 3 months of their initial hospitalization. 1/3 of these readmissions are within the first 2 weeks, and more than half of the readmissions involved infection or recurring sepsis.

30-day readmissions lead to significant mortality among sepsis survivors and contribute substantial cost to the healthcare system. On average, these readmissions cost $25,000–$30,000 each and are estimated to cost $1.4B annually for Medicare beneficiaries alone.

### Peri-discharge processes and interventions that may impact readmission rates

| PROCESS/INTERVENTION | IMPLEMENTATION |
|---|---|
| Medication reconciliation | Post-discharge phone call (day 3–5) for medication reconciliation resulted in reduced 7-day and 14-day readmissions. |
| Improved access to primary care | Ensure establishment and follow-up with PCP in 48 hours post-discharge. |
| Availability of discharge summary | Ensures that a discharge summary is available at the time of the post-discharge follow-up visit to create a strong continuum of care. |
| Telehealth | Remote monitoring of VS, blood sugars, and other hemodynamic measures can help identify changes in patient status. |
| Phone interviews | Weekly phone calls and progress analysis to identify any increasing risk factors. |
| Connect with necessary services | Ensure that patient has access to all necessary support services on discharge: rehab and therapy, home health, meals, etc. |

## Avoiding a Septic Readmission

Prior to discharge of a sepsis patient make sure you have:

- ☐ Normalized the lactate
- ☐ Assessed and planned for delirium care and support
- ☐ Resolved, or see a trend towards normalization of organ dysfunction
- ☐ Narrowed the spectrum of any antibiotics, and educate on necessity of completing the prescribed course
- ☐ Educated on the signs and symptoms of infection if discharged with a line, drain, wound, catheter, etc.
- ☐ Ensure you have evaluated and planned for any changes in functional status
- ☐ Planned for discharge to appropriate level of care
- ☐ Follow up appointment made with appropriate providers, based on current condition

## Lessons learned from sepsis readmissions reviews:

- Provide comprehensive interdisciplinary services
- Know your organizations sepsis data -- # of sepsis patients per day/week
- Add sepsis to standard huddles
- Link sepsis patients to existing care transitions programs
- The sepsis coordinator can be a new, natural partner
- Periodically, reflect and refresh strategy
- Monitor implementation of key processes
- Culture of change – be creative, try new ideas and celebrate wins
- Pick up the phone and build a relationship – SNFs are thrilled to be a part
- Make post discharge calls to SNFs
- Get patient feedback for your educational materials
- Readmission interviews unlock insights
- Refine patient education materials

# Preventable Readmissions Top Ten Checklist

Develop a data-informed targeting strategy to identify target populations with higher than average rates of readmissions. Deliver enhanced readmission reduction strategies to these "target population" patients.

Identify root causes of readmissions based on interviewing patients, caregivers and providers. Prioritize your improvement strategies based on those that will address the root causes of readmissions among your patients.

Improve care transition processes for all patients, regardless of readmission risk. Refer to the proposed practices articulated in the proposed CMS Conditions of Participation for Discharge Planning.

Provide a customized transitional care plan for all patients.

Effectively communicate with patients and caregivers. Use translation services, teach-back, motivational interviewing and materials written in plain language.

Deliver enhanced readmission reduction services for your target populations based on their root causes of readmissions.

Design a high utilizer approach for patients with four or more admissions per year. Identify their "driver of utilization," and use care plans to improve care across settings.

Engage the emergency department as a new site of readmission reduction activities.

Collaborate with clinical, behavioral, and social service providers to improve cross-setting care processes for shared patient populations. Ensure you are aware of the services and supports that are available from other providers and agencies in your community.

Measure what you implement, driving to reliable delivery of improved processes.

*Many survivors are left with* **LIFE-CHANGING** *challenges.*

# LIFE AFTER SEPSIS FACT SHEET

**WHAT SEPSIS SURVIVORS NEED TO KNOW**

## ABOUT SEPSIS

### What is sepsis?

Sepsis is a complication caused by the body's overwhelming and life-threatening response to an infection, which can lead to tissue damage, organ failure, and death.

### What causes sepsis?

Any type of infection that is anywhere in your body can cause sepsis. It is often associated with infections of the lungs (e.g., pneumonia), urinary tract (e.g., kidney), skin, and gut. An infection occurs when germs enter a person's body and multiply, causing illness and organ and tissue damage.

## LIFE AFTER SEPSIS

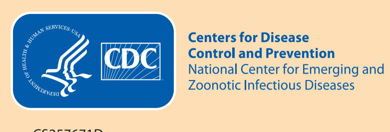
### What are the first steps in recovery?

After you have had sepsis, rehabilitation usually starts in the hospital by slowly helping you to move around and look after yourself: bathing, sitting up, standing, walking, taking yourself to the restroom, etc. The purpose of rehabilitation is to restore you back to your previous level of health or as close to it as possible. Begin your rehabilitation by building up your activities slowly, and rest when you are tired.

### How will I feel when I get home?

You have been seriously ill, and your body and mind need time to get better. You may experience the following physical symptoms upon returning home:

- General to extreme weakness and fatigue
- Breathlessness
- General body pains or aches
- Difficulty moving around
- Difficulty sleeping
- Weight loss, lack of appetite, food not tasting normal
- Dry and itchy skin that may peel
- Brittle nails
- Hair loss

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It is also not unusual to have the following feelings once you're at home:

- Unsure of yourself
- Not caring about your appearance
- Wanting to be alone, avoiding friends and family
- Flashbacks, bad memories
- Confusing reality (e.g., not sure what is real and what isn't)
- Feeling anxious, more worried than usual
- Poor concentration
- Depressed, angry, unmotivated
- Frustration at not being able to do everyday tasks

## What can I do to help myself recover at home?

- Set small, achievable goals for yourself each week, such as taking a bath, dressing yourself, or walking up the stairs
- Rest and rebuild your strength
- Talk about what you are feeling to family and friends
- Record your thoughts, struggles, and milestones in a journal
- Learn about sepsis to understand what happened
- Ask your family to fill in any gaps you may have in your memory about what happened to you
- Eat a balanced diet
- Exercise if you feel up to it
- Make a list of questions to ask your doctor when you go for a check up

## Are there any long-term effects of sepsis?

Many people who survive sepsis recover completely and their lives return to normal. However, as with some other illnesses requiring intensive medical care, some patients have long-term effects. These problems may not become apparent for several weeks (post-sepsis), and may include such consequences as:

- Insomnia, difficulty getting to or staying asleep
- Nightmares, vivid hallucinations, panic attacks
- Disabling muscle and joint pains
- Decreased mental (cognitive) functioning
- Loss of self-esteem and self-belief
- Organ dysfunction (kidney failure, respiratory problems, etc.)
- Amputations (loss of limb(s)

*This fact sheet was developed in collaboration with CDC, Sepsis Alliance® and the Rory Staunton Foundation for Sepsis Prevention.*

## What's normal and when should I be concerned?

Generally, the problems described in this fact sheet do improve with time. They are a normal response to what you have been through.

Some hospitals have follow-up clinics or staff to help patients and families once they have been discharged. Find out if yours does or if there are local resources available to help you while you get better.

However, if you feel that you are not getting better, or finding it difficult to cope, or continue to be exhausted call your doctor.

## Where can I get more information?

- Centers for Disease Control and Prevention (CDC)—CDC works 24/7 protecting America's health, safety and security. Whether diseases start at home or abroad, are curable or preventable, chronic or acute, stem from human error or deliberate attack, CDC is committed to responding to America's most pressing health challenges.
  cdc.gov/sepsis
  cdc.gov/cancer/preventinfections
- The Rory Staunton Foundation for Sepsis Prevention—Supports education and outreach efforts aimed at rapid diagnosis and treatment of sepsis, particularly in children.
  rorystauntonfoundationforsepsis.org
- Sepsis Alliance®—Created to raise sepsis awareness among both the general public and healthcare professionals. Sepsis Alliance offers information on a variety of sepsis-related topics. Visit sepsis.org/library to view the complete series of titles.
  sepsis.org

# Signs of Infection and Sepsis at Home

*I recently had an infection: __________________.*

*Common infections can sometimes lead to sepsis. Sepsis is a deadly response to an infection.*

| Zone | Signs | Action |
|---|---|---|
| Green Zone | • My heartbeat is as usual. Breathing is normal for me<br>• I have not had a fever in the past 24 hours and I am not taking medicine for a fever<br>• I do not feel chilled<br>• My energy level is as usual<br>• My thinking is clear<br>• I feel well<br>• I have taken my antibiotics as prescribed<br>• I have a wound or IV site, it is not painful, red, draining pus or smelling bad | **Doing Great!**<br><br>No action is needed. |
| Yellow Zone | • My heartbeat is faster than usual<br>• My breathing is a bit more difficult and faster than usual<br>• I have a fever between 1000F to 101.40F<br>• I feel chilled and cannot get warm. I am shivering or my teeth are chattering<br>• I am too tired to do most of my usual activities<br>• I feel confused or not thinking clearly<br>• I do not feel well<br>• I have a bad cough or my cough has changed<br>• How often I urinate has changed. When I do urinate, it burns, is cloudy or smells bad<br>• My wound or IV site has changed | **Take action today!**<br><br>Call your **home health nurse**:<br><br>________________________<br>*(Phone number)*<br><br>or call your **doctor**:<br><br>________________________<br>*(Phone number)* |
| Red Zone | • My heartbeat is very fast<br>• My breathing is very fast and more difficult<br>• My temperature is below 96.8ºF. My skin or fingernails are pale or blue<br>• My fever is 101.50F or more<br>• I have not urinated for 5 or more hours<br>• I am very tired. I cannot do any of my usual activities<br>• My caregivers tell me I am not making sense<br>• I feel sick<br>• My cough is much worse<br>• My wound or IV site is painful, red, smells bad or has pus | **Take action NOW!**<br><br>Call your **home health nurse**:<br><br>________________________<br>*(Phone number)*<br><br>Or call your **doctor**:<br><br>________________________<br>*(Phone number)*<br><br>Call your home health nurse before going to the Hospital Emergency Department |

Sources: Sepsis Alliance, sepsis.org; Centers for Disease Control and Prevention (CDC), cdc.gov; and atom Alliance, atomalliance.org

# PROCESS IMPROVEMENT DISCOVERY TOOL

## READMISSIONS – PART 1A

**The Process Improvement Discovery Tool is meant to help hospitals provide safer patient care by completing an assessment to identify process improvement opportunities. Hospitals can use the results to develop specific strategies to address gaps and identify resource needs. To complete the Readmissions – Part 1A, you will need to identify patients who are currently experiencing a readmission. The purpose of Readmissions – Part 1B is to identify gaps and opportunities for improvement in care transition planning.**

**Instructions**

Enter the information for each readmitted patient medical record reviewed.

Minimum 5 patient Medical Record Numbers/Maximum 10 patient Medical Record Numbers

| PROCESS | MEDICAL RECORD NUMBER (MRN) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | MRN: | MRN: | MRN: | MRN: | MRN: | MRN: | MRN: | MRN: | MRN: | MRN: |
| Primary diagnosis (index admission) | | | | | | | | | | |
| Discharge disposition from index admission (home, home health, SNF, etc.) | | | | | | | | | | |
| Number of days between discharge date and readmission date | | | | | | | | | | |
| Total number of hospitalizations at this organization in last 12 months | | | | | | | | | | |

1

## PROCESS IMPROVEMENT DISCOVERY TOOL — READMISSIONS – PART 1B

**Instructions**

Please complete an interview using the process questions below for each patient identified in Readmissions – Part 1A. Interviews must take place while the patient is currently experiencing a readmission. If the patient is unable to participate in the interview, please complete it with the primary caregiver.

| PROCESS | MRN: |
|---|---|
| In patient's own words, reason for index admission | |
| In patient's own words, reason for readmission | |
| Was patient able to attend follow up appointment? If no, why not? | |
| Did patient feel that something could have been done by the hospital either during the index admission or after discharge to prevent the readmission? If yes, explain. | |
| Did patient understand the instructions for discharge medications? If no, was this a contributing factor to the readmission? If yes, explain. | |
| Was patient able to fill discharge prescriptions? If not, why? | |
| Were any social determinates of health identified, including but not limited to transportation, health literacy, food security, housing? If yes, explain? | |
| Other contributing factors to the readmission? Please explain. | |

# PROCESS IMPROVEMENT DISCOVERY TOOL READMISSIONS – PART 2

**Instructions**

Using the same patients identified in Part 1, review the medical record and answer the following questions.
1. If the answer to the question is 'Yes", mark an X in the box.
2. If the question is not applicable to the patient, mark an NA in the box.
3. Leave the box empty if there is no documentation that this important process occurs.
4. The processes with the most blank boxes could be a priority focus.
Minimum 5 patient Medical Record Numbers/Maximum 10 patient Medical Record Numbers

| PROCESS | MEDICAL RECORD NUMBER (MRN) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | MRN: | MRN: | MRN: | MRN: | MRN: | MRN: | MRN: | MRN: | MRN: | MRN: |
| Documentation that a medication list was provided to patient or caregiver at discharge. | | | | | | | | | | |
| Information about the patient's condition was documented and provided to the next level of care receiver. (Patient, Caregiver, Home Health, Primary Care Provider, SNF) | | | | | | | | | | |
| For patients with a comorbid behavioral health condition, is a follow up appointment with a behavioral health provider documented? | | | | | | | | | | |
| For patients that require assistance from social services, was a direct linkage documented instead of asking patient to self-navigate? | | | | | | | | | | |
| The primary learner/caregiver is identified and documented in the medical record | | | | | | | | | | |
| Teach back is documented when discharge education is provided. | | | | | | | | | | |
| A customized care transitions plan was developed and documented in the medical record that includes: | | | | | | | | | | |
| > information about obtaining and taking medications | | | | | | | | | | |
| > information about signs and symptoms and what to do if they occur | | | | | | | | | | |
| > plan for follow-up appointments, labs or tests, if applicable | | | | | | | | | | |
| > plan for transportation to get to the follow-up appointments | | | | | | | | | | |
| A post-discharge phone call is documented | | | | | | | | | | |
| A follow up appointment was scheduled and documented for patient | | | | | | | | | | |

# What is Sepsis?

Sepsis is a **life-threatening** condition caused by your body's negative response to any kind of infection.

## How did I get sepsis?

- Any infection can lead to sepsis
- Sepsis is not contagious
- Anyone, young or old, with an infection is at risk

## What is my treatment plan?

- Find where the infection is in your body
- Treat the infection with IV fluids and antibiotics
- Test your blood to ensure organs are working properly
- Continue to monitor and support your organ function

## How can I prevent sepsis?

- Take care of your existing health conditions
- Get recommended vaccinations
- Wash your hands, brush your teeth and bathe regularly
- Keep cuts clean and covered until healed
- Know the signs and symptoms of sepsis

## Can I get sepsis again?

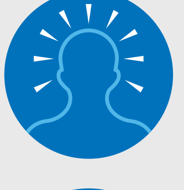
- Yes, sepsis survivors are more at risk to develop sepsis again

## Where can I learn more?

- Sepsis Alliance – sepsis.org
- CDC – cdc.gov/sepsis

## SIGNS OF SEPSIS

- Fever, chills or sweaty skin
- Extreme pain or discomfort



- Confusion - trouble with normal daily tasks
- Shortness of breath
- Diarrhea and vomiting

**If you have any combination of these, call your doctor or go to the emergency room.**

***It's important to say "I AM CONCERNED ABOUT SEPSIS."***

Form 2137 (06/19)

## Watch for Signs of Infection and Sepsis after You Leave the Hospital

You are at a greater risk of an infection since you have been in the hospital with an infection or sepsis. Recognizing and reporting the signs of an infection is key to preventing sepsis.
Follow the recommended action if you have these signs.

### Take action today to treat an infection and prevent sepsis.

**Call your doctor if you have:**

- A fever between 100° to 101.4°
- Chills, shivering or teeth chattering
- Fatigue, too tired to do most activities
- Thinking that feels slow or not right
- Wounds or I.V. site that look different, infected
- Low urine output (I haven't urinated for 5 or more hours)
- Urine burns, is cloudy , dark and smelly
- Heartbeat is faster than usual
- Breathing is more difficult and faster than usual
- Home blood pressure is 20 points (top number) lower than usual

### Take action NOW if you have these signs of sepsis!

**Speak to your doctor or go to the emergency room if you have:**

- A fever is 101.5° or greater
- Your temperature is below 96.8°
- Skin or fingernails are pale
- Weakness, too weak to get out of bed
- Confusion
- Wounds or I.V. site has pus
- Low urine output (I haven't urinated for 6 or more hours)

**Call 911 if:**

- Heartbeat is very fast
- Breathing is very fast
- Home blood pressure is 40 points (top number) lower than usual
- Fever of 103.5° or greater
- My skin or fingernails are blue

5/1/2019

# Quality Measurement / Continuous Improvement

## Things to consider when caring for a septic patient:

- Define real time method for tracking patients (i.e. patient log)
- Example forms are available in the Appendix of the Hospital Toolkit for Adult Sepsis Surveillance, published by the CDC
- Define concurrent review process for core measure and core measures defect review process
- Sepsis Coordinator communicates with clinical areas to answer questions and ensure appropriate processes are being followed (bundles, protocols, documentation)
- Review data and ideas for improvement at team meetings.
- Do you have a way to know your data elements that fall out each month and a process for follow up?
- Do you have a process to address deviations from evidence-based care processes with physicians, nurses, and other clinical staff?
- When auditing successes - Make sure to have clear expectations for all disciplines and staff education is important!

## Sepsis Process Data Tracking

**Courtesy of Mary Lanning Healthcare**

In order to better understand delays or "fall-outs" in the sepsis process, individual parts of the process should be tracked for each patient that has a sepsis diagnosis. Below is a data reporting template that can be implemented to track sepsis process completion.

| Sepsis Process Data Points | Q1 Avg | Q2 Avg | Q3 Avg | Q4 Avg | Annual Avg |
|---|---|---|---|---|---|
| Arrival Time to Infection Documentation | | | | | |
| Arrival Time to Lactic Acid Collected | | | | | |
| Arrival Time to Blood Culture Collected | | | | | |
| Severe Sepsis Presentation to AB Ordered | | | | | |
| AB Order to Administration | | | | | |
| Arrival Time to AB Administration | | | | | |
| Arrival Time to Fluid Bolus Administration<br>• Arrival Time to Documentation of a medical reason for differing fluid administration order | | | | | |
| Arrival Time to Hospital Admission | | | | | |
| Arrival Time to Vasopressors | | | | | |
| Arrival Time to Follow-up Exam Completed | | | | | |

# RN Sepsis Communication Tool

Patient Sticker

***TIME ZERO:***
*(triage time)*

***PATIENT WT:***
***If Ideal weight used, note in chart***

12 1 2 3 4 5 6 7 8 9 10 11

***Sepsis – Does the patient have Two of the following plus suspected infection?***

☐ Suspected infection
☐ T: >100.9F or ☐ <96.8F
☐ HR: >90
☐ RR: >20/min

***Severe Sepsis***

☐ WBC: >12,000 or ☐ <4,000 or ☐ >10% bands
☐ Lactic > 2mmol/L ☐ SBP< 90 ☐ MAP <65 ☐ < urine output ☐ respiratory failure

***Items to be complete within 3hrs from TIME ZERO:***

***TIME:***

☐ Initial lactic acid (time:_________)
☐ Blood Cultures before antibiotics (time:________)
☐ Broad spectrum antibiotics (time:__________) ***shortest 1st!!**
☐ Fluid bolus administration: 30ml/kg (total input:_________) **Remember completion time and I&Os**

***4hrs from TIME ZERO:***

☐ Obtain ***2nd*** lactic acid be sure it is drawn ***after*** fluid bolus is complete

***TIME:***

***Items to be complete within 6hrs from TIME ZERO:***

☐ Vasopressors if hypotensive (name__________) ****after fluid bolus!!!***
☐ Repeat focused exam by MD needs to include reassessment of perfusion status

***TIME:***

****If form not complete in ED, send to floor with pt to be completed***
****Return form to ED manager upon completion.***

# POST-OP SEPSIS PREVENTION PROCESS

**The Process Improvement Discovery Tool is meant to help hospitals provide safer patient care by completing an assessment to identify process improvement opportunities. Hospitals can use the results to develop specific strategies to address gaps and identify resource needs. Please complete the tool using patient charts that align with this specific topic.**

**Instructions:**

1. If the answer to the question is 'Yes", mark an X in the box to indicate that the desired process was discovered. You may check more than one box per chart.
2. The processes that are not marked with an X may indicate the most common failures and could be a priority focus.

Minimum 5 charts/Maximum 10 charts

**Do NOT** spend more than 20-30 minutes per chart!

| PROCESS | Chart # | Chart # | Chart # | Chart # | Chart # | Chart # | Chart # | Chart # | Chart # | Chart # |
|---|---|---|---|---|---|---|---|---|---|---|
| **Ambulatory Pre-Operative Infection Prevention Strategies** | | | | | | | | | | |
| Patient received incentive spirometer device and instruction at time of surgery scheduling | | | | | | | | | | |
| Patient stopped smoking at time of surgery scheduling | | | | | | | | | | |
| Patient completed 2 sessions of outpatient PT in advance of orthopedic surgery | | | | | | | | | | |
| **SSI Care bundle compliance** | | | | | | | | | | |
| Prophylactic antibiotics were given appropriately with timely start and stop | | | | | | | | | | |
| Normothermia was maintained through duration of peri-op period | | | | | | | | | | |
| Supplemental oxygen provided pre op, intra op and post op | | | | | | | | | | |
| Pre op skin antisepsis was performed | | | | | | | | | | |
| **Additional Peri-Operative Infection Prevention Strategies** | | | | | | | | | | |
| Patient had an indwelling foley less than 2 days **AND** foley met insertion criteria | | | | | | | | | | |
| Patient received multimodal pain therapy (non narcotics and non medicinal) with or without opioids | | | | | | | | | | |
| Patient was mobilized at least 3 times/ day | | | | | | | | | | |
| Good patient adherence of proper pulmonary toilet processes ( ie.Bedside incentive spirometer used 10x/hr. while awake) | | | | | | | | | | |
| Good patient adherence of proper pulmonary toilet processes (Bedside incentive spirometer used 10x/hr while awake) | | | | | | | | | | |

| Hand Hygiene compliance in department is greater than 85% | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| SSI Rates are below benchmark | | | | | | | | | | |
| **OBSERVATION** | | | | | | | | | | |
| **Patient Information** | | | | | | | | | | |
| Age Greater than 65 years | | | | | | | | | | |
| Elective procedure performed was? | | | | | | | | | | |
| Source of infection that led to sepsis was? | | | | | | | | | | |
| Patient was admitted to ICU? | | | | | | | | | | |
| How many days post-op was the sepsis identified? | | | | | | | | | | |

**NOTE: patients at increased risk for sepsis are those with intra-abdominal processes, catheters, central lines, drains, renal calculi, cholelithiasis, trauma, and other lines**

### Sample Letter - Physician Care of a Septic Patient

**Dear Provider,**

You are receiving this letter because you had the opportunity to participate in the care of a patient diagnosed with Severe Sepsis and/or Septic Shock. As you know, Severe Sepsis is a time sensitive disease state that requires prompt treatment and early goal directed therapy. Here at ____________________,

We strive to adhere to the Surviving Sepsis Campaign guidelines for the management of severe sepsis and septic shock which recommend the use of evidence based 3 hour and 6 hour resuscitation bundles. Current evidence shows that adherence to these treatment bundles results in a significant decrease in mortality. Below you will find the 3 hour and 6 hour treatment bundle goals and if/when they were achieved for your patient with severe sepsis and/or septic shock. If you have questions or would like more information regarding the management of severe sepsis or septic shock, please contact the Sepsis Committee. Thank you for working with the Sepsis Committee to provide the best care for our patients.

Sincerely,

The Sepsis Committee

| Severe Sepsis/Septic Shock Recognition | |
|---|---|
| | |
| **3 Hour Resuscitation Bundle** | **Time Completed** |
| Serum Lactate Measured | |
| Blood Cultures Obtained | |
| Broad Spectrum Antibiotics Administered | |
| 30 ml/kg Initial Fluid Challenge Given | |
| **6 Hour Resuscitation Bundle** | **Time Completed** |
| Vasopressors for refractory hypotension | |
| Repeat Focused Physical Exam<br>OR<br>2 of the following completed:<br>Measure CVP<br>Measure Scv02<br>Bedside CV ultrasound<br>Passive leg raise or fluid challenge | |
| Lactate Re-measured if initial is elevated | |

### Sample Recognition Letter to Provider

Medical Record #:_____________ Hospital Logo

Account# _____________

Occurrence Date:_____________

**Dear (PROVIDER),**

To improve the quality of care and outcomes experienced by patients that present to the hospital with sepsis, a CODE: SEPSIS process that is consistent with nationally accepted guidelines has been implemented. If a patient meets SIRS criteria and there is a suspected or known source of infection, the hospital requires that this process be utilized. In addition, data for severe sepsis and septic shock patients will be reported quarterly to the Centers for Medicare and Medicaid.

We would like to take this moment to commend you for the prompt identification, treatment, and documentation of this severe sepsis patient you recently cared for. Your efforts in providing the highest quality care offers our patients their best chance at surviving and recovering from this life-threatening event. Thank you for all you do.

Sincerely,

The Quality Team

Confidential, Patient Safety Work Product

Not for reproduction or distribution -destroy after use

# Evaluation Tool of Sepsis Care

Courtesy of Nebraska Methodist Health System

## SEPSIS

| Patient Label Location: | Sepsis Alert<br>Date:<br>Time: | Provider Notified ☐<br>(Name, Date, Time) | Sepsis Advisor Time |
|---|---|---|---|
| Suspected Infection Source Site: (New or Worsening) | RRT Called | Possible Sepsis? | Transferred Y / N |

| Sepsis Alert Triggers:<br>SIRS (2 or more):<br>Organ Dysfunction: | NEWS ALERT SCORE |
|---|---|

| | Date: | Time: | Result: |
|---|---|---|---|
| **qSOFA** (outside of the ICU) | | | |
| **SOFA** (ICU patients) | | | |

**To be Completed within 3 hours**

| | Date | Time | |
|---|---|---|---|
| ☐ Initial Lactate Drawn | | | Result: |
| ☐ Blood Cultures Drawn x2<br>Before antibiotic administration do not delay antibiotic administration if unable to obtain blood cultures.<br>-If unable to draw B.C. before antibiotic please list why in notes section. | | | Result: |
| ☐ Broad Spectrum Antibiotics Administered:<br>1st antibiotic given within 1 hour (order stat)<br>1. | | | |
| ☐ 2.<br>(does not always require 2nd antibiotic) | | | |
| ☐ 30mL/kg crystalloid IVF Bolus<br>If hypotensive or original lactate > 4mmol/L<br>Weight used for fluid amount: ☐ Actual ☐ Ideal Body Weight | | Start:<br>End: | Total Given ☐ Total Charted ☐ |

**To be Completed within 6 Hours**

| | Date | Time | |
|---|---|---|---|
| ☐ Repeat Lactate 4-6 hours from initial lactate<br>If Initial Lactate >2 | | | Result: |
| ☐ Vasopressors Started<br>If hypotension persists after fluid administration (MAP <65mm/Hg) | | | Medication: |
| ☐ Repeat Volume Status and Tissue Perfusion Assessment<br>If Septic Shock presentation:<br>Hypotension after fluid administration or initial lactate >=4mmol/L | | | Method:<br>Documented by: |

Notes:

| | |
|---|---|
| Sepsis | Defined as: life-threatening organ dysfunction caused by a dysregulated host response to infection<br>*In other terms*: a life-threatening condition that arises when the body's response to an infection injures its own tissues and organs. |
| Septic Shock | Defined as: a subset of sepsis in which underlying circulatory and cellular metabolic abnormalities are profound enough to substantially increase mortality.<br>Sepsis with persisting hypotension requiring vasopressors to maintain a MAP>= 65mm Hg and having a serum lactate level >2mmol/L despite adequate volume resuscitation. |
| Time Zero | Starts when Sepsis is identified or Sepsis alert fires |
| Repeat Volume Status and Tissue Perfusion Assessment: | Focused exam—Physician/APRN/PA note must include physical exam of perfusion (reperfusion)<br>Example: "Sepsis re-evaluation was performed", or physical exam including perfusion.<br>NICOM (PLR or Bolus), CVP, ScvO2 |

| SIRS (Systemic Inflammatory Response Syndrome) |
|---|
| Two or more of:<br>•Temperature >38.3°C or <36.0°C (>100.9°F or < 96.8°F)<br>•Heart rate >90/min<br>•Respiratory rate >20/min or $Pa_{CO_2}$ <32 mm Hg (4.3 kPa)<br>•White blood cell count >12 000/$mm^3$ or <4000/$mm^3$ or >10% immature bands |

| Organ Dysfunction | |
|---|---|
| •SBP<90mmHg or MAP<65<br>•Creatinine >=2.0 and increase of 0.5mg/dL over 72 hours<br>•Billirubin >=2.0 and =<10.0mg/dL | •Platelet count <100,000 $uL^{-1}$<br>•INR >1.5<br>•Lactate > 2.0mmol/L<br>•Respiratory Failure (e.g. vent, BiPAP) |

| qSOFA: (Quick SOFA) | |
|---|---|
| Respiratory rate ≥22/min | 1 |
| Alerted Mentation | 1 |
| Systolic blood pressure ≤100 mm Hg | 1 |
| Total score of 2 or 3 = increased Mortality Risk | |

**SOFA: (Sepsis-Related) Organ Failure Assessment Score**

| System Score: | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| **Respiration**<br>$PaO_2/FiO_2$, mmHg | >=400 | <400 | <300 | <200 with respiratory support | <100 with respiratory support |
| **Coagulation**<br>Platelets, x$10^3$/uL | >=150 | <150 | <100 | <50 | <20 |
| **Liver**<br>Bilirubin, mg/dL | <1.2 | 1.2-1.9 | 2.0-5.9 | 6.0-11.9 | >12.0 |
| **Cardiovascular** | MAP >=70mmHg | MAP <70mmHg | Dopamine<5 or dobutamine | Dopamine 5.1-15 or epinephrine =<0.1 or norepinephrine =< 0.1 | Dopamine >15 or epinephrine >0.1 or norepi-nephrine => 0.1 |
| **Central Nervous System**<br>Glascow Coma Scale Score | 15 | 13-14 | 10-12 | 6-9 | <6 |
| **Renal**<br>Creatinine, mg/dL<br>Urine output, mL/day | <1.2 | 1.2-1.9 | 2.0-3.4 | 3.5-4.9<br><500 | >5.0<br><200 |
| A score of 2 or higher in any system indicates organ dysfunction and an elevated risk of mortality. | | | | | |

Singer M, Deutschman CS, Seymour CW, et al. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). *JAMA.* 2016;315(8):801–810. doi:10.1001/jama.2016.0287

Last Updated: Version 5.7

**Appendix A.1**
**ICD-10 Code Tables**

**Table Index**

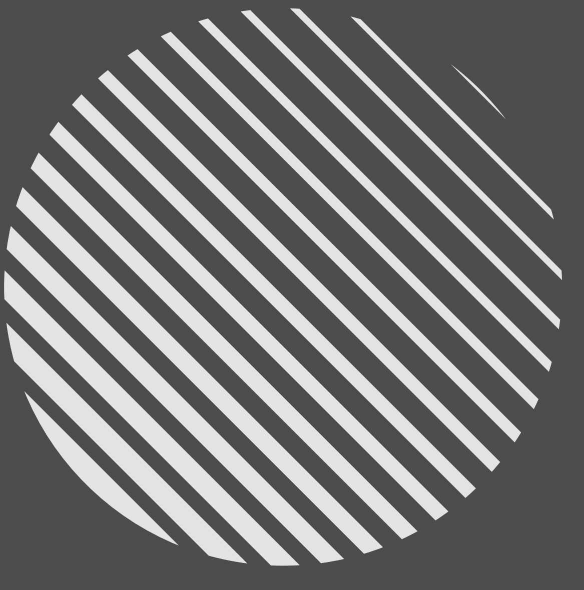
| **Number** | **Table Name** *(Select a table name to be directed to table)* | **Page** |
|---|---|---|
| Table 4.01 | Severe Sepsis and Septic Shock (SEP) | Appendix A-1 |

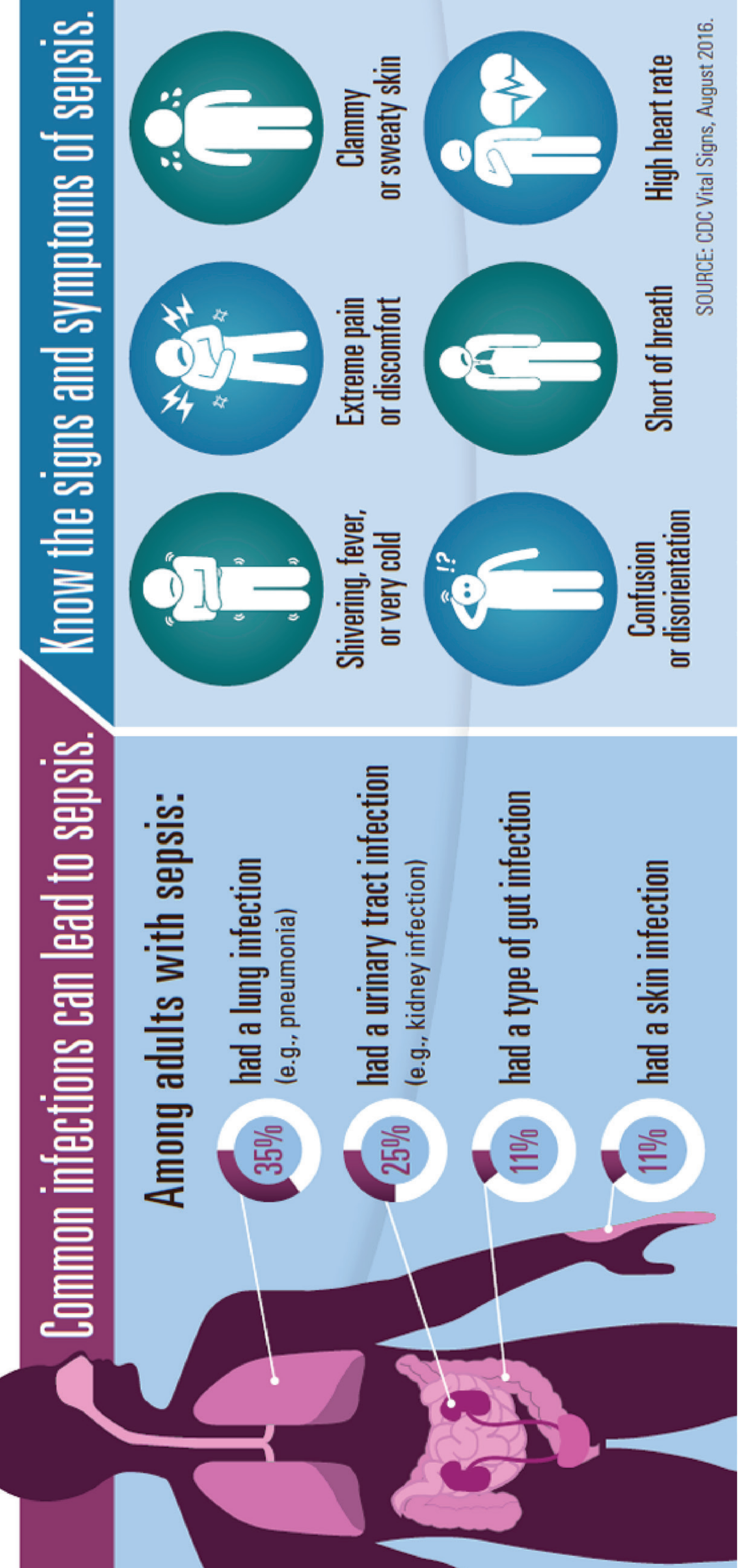
Last Update: Version 5.4

**Table 4.01: Severe Sepsis and Septic Shock (SEP)**

| ICD-10-CM Code | Code Description |
|---|---|
| A021 | Salmonella sepsis |
| A227 | Anthrax sepsis |
| A267 | Erysipelothrix sepsis |
| A327 | Listerial sepsis |
| A400 | Sepsis due to streptococcus, group A |
| A401 | Sepsis due to streptococcus, group B |
| A403 | Sepsis due to Streptococcus pneumoniae |
| A408 | Other streptococcal sepsis |
| A409 | Streptococcal sepsis, unspecified |
| A4101 | Sepsis due to Methicillin susceptible Staphylococcus aureus |
| A4102 | Sepsis due to Methicillin resistant Staphylococcus aureus |
| A411 | Sepsis due to other specified staphylococcus |
| A412 | Sepsis due to unspecified staphylococcus |
| A413 | Sepsis due to Hemophilus influenzae |
| A414 | Sepsis due to anaerobes |
| A4150 | Gram-negative sepsis, unspecified |
| A4151 | Sepsis due to Escherichia coli [E. coli] |
| A4152 | Sepsis due to Pseudomonas |
| A4153 | Sepsis due to Serratia |
| A4159 | Other Gram-negative sepsis |
| A4181 | Sepsis due to Enterococcus |
| A4189 | Other specified sepsis |
| A419 | Sepsis, unspecified organism |
| A427 | Actinomycotic sepsis |
| A5486 | Gonococcal sepsis |
| R6520 | Severe sepsis without septic shock |
| R6521 | Severe sepsis with septic shock |

# Education




Healthcare providers are key to preventing infections and illnesses that can lead to sepsis.
EDUCATE patients and their families about the early symptoms of severe infection and sepsis, and when to seek care for an infection, especially those at higher risk.
REMIND patients that taking care of chronic illnesses helps prevent infections.
ENCOURAGE infection prevention measures, such as hand hygiene and vaccination against infections.
Common infections can lead to sepsis.
Among adults with sepsis:
35% had a lung infection (e.g., pneumonia)
25% had a urinary tract infection (e.g., kidney infection)
11% had a type of gut infection
11% had a skin infection
Know the signs and symptoms of sepsis.
Shivering, fever, or very cold
Extreme pain or discomfort
Clammy or sweaty skin
Confusion or disorientation
Short of breath
High heart rate
SOURCE: CDC Vital Signs, August 2016.

Education

# PROTECT YOUR PATIENTS FROM SEPSIS.

**Infections put your patients at risk for sepsis. Be alert to the signs and symptoms, and when suspected, act fast.**

Sepsis is the body's extreme response to an infection. It is life-threatening, and without prompt treatment, often rapidly leads to tissue damage, organ failure, and death.

## SEPSIS STATS

More than **1.7 MILLION** adults develop sepsis each year in the U.S.

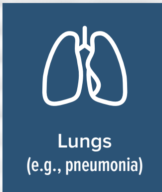
Nearly **270,000** Americans die from sepsis each year

About **1 IN 3 PATIENTS** who die in a hospital have sepsis

## WHAT CAUSES SEPSIS?

**The most frequently identified pathogens that cause infections that can develop into sepsis include *Staphylococcus aureus* (staph), *Escherichia coli* (E. coli), and some types of *Streptococcus*.**

**Four types of infections that are often linked with sepsis:**


Lungs (e.g., pneumonia)

Urinary tract (e.g., kidney)

Skin

Gut

## WHO IS AT RISK?

**Anyone can get an infection, and almost any infection can lead to sepsis.** Some people are at higher risk of infection and sepsis:

Adults 65 or older

People with chronic medical conditions, such as diabetes, lung disease, cancer, and kidney disease

People with weakened immune systems

Children younger than one

# WHAT ARE THE SIGNS AND SYMPTOMS OF SEPSIS?

Signs and symptoms can include any one or a combination of the following:

Confusion or disorientation

Shortness of breath

High heart rate

Fever, or shivering, or feeling very cold

Extreme pain or discomfort

Clammy or sweaty skin

# HOW CAN I GET AHEAD OF SEPSIS?

Healthcare professionals can:

- **Know sepsis signs and symptoms** to identify and treat patients early.
- **Act fast** if you suspect sepsis.
- **Prevent infections** by following infection control practices (e.g., hand hygiene, catheter removal) and ensuring patients receive recommended vaccines.
- **Educate your patients and their families about:**
  - Preventing infections.
  - Managing chronic conditions.
  - Keeping cuts clean and covered until healed.
  - Recognizing early signs and symptoms of worsening infection and sepsis and seeking immediate care if present.

**Sepsis is a medical emergency.** Protect your patients by acting fast. Your fast recognition and treatment can increase your patients' chances of survival.

# WHAT SHOULD I DO IF I SUSPECT SEPSIS?

**Know your facility's existing guidance for diagnosing and managing sepsis.**

- **Immediately alert the clinician in charge if it is not you.**
- **Start antibiotics as soon as possible, in addition to other therapies appropriate for the patient.**
- **Check patient progress frequently.** Reassess antibiotic therapy within 24-48 hours to stop or change therapy as needed. Be sure antibiotic type, dose, and duration are correct.

Learn more about sepsis and how to prevent infections: **www.cdc.gov/sepsis**.

**KNOW THE RISKS. SPOT THE SIGNS. ACT FAST.**

*PubNo. 300422*

## Community Awareness

- Awareness – there is a deficit in sepsis awareness
- Only 55% of U.S. adults have heard of sepsis
- As many as 87% of sepsis cases originate in the community
- Spreading the awareness of the signs and symptoms of sepsis is critical

# SEPSIS

***Sepsis*** is the body's extreme response to an infection. It is a ***medical emergency***, and without timely treatment, it can rapidly cause tissue damage, organ failure and death. Sepsis happens when an infection you already have - in your skin, lungs, urinary tract or somewhere else - triggers a chain reaction throughout your body.

## SPOT THE SIGNS

There is no single symptom of sepsis. Symptoms can include a combination of any of the following:

**Confusion or disorientation**

**Fever, shivering or feeling cold**

**Shortness of breath**

**Fast heart rate**

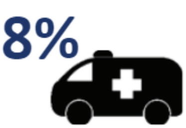
**Extreme pain or discomfort**

**Clammy or sweaty skin**

**911** *If you spot the signs of sepsis, call 911.*

## ACT FAST

**80%** of patients had symptoms of sepsis prior to hospitalization



Risk of death increases **8%** every **hour** that sepsis goes untreated

**1 person every 2 minutes** dies from sepsis in the U.S.

Only **55%** of U.S. adults have heard of sepsis

**Spotting the signs** of sepsis early and getting treatment **saves lives!**

If you suspect sepsis or have an infection that is not getting better or is getting worse, **seek medical care IMMEDIATELY!**

*Source: www.cdc.gov/sepsis and www.sepsis.org*

## Integrating PFE Strategies into your Harms Reduction Efforts

| | CHANGE IDEAS | | | | |
|---|---|---|---|---|---|
| | **POINT OF CARE**<br>Implementation Partners:<br>Point of Care Providers,<br>Medical Directors, Nurse Managers | | **POLICY & PROTOCOL**<br>Implementation Partners:<br>Quality and Safety Leaders<br>Medical Directors, Nurse Managers,<br>Patient Experience Leaders | | **GOVERNANCE**<br>Implementation Partners:<br>Board of Directors, C-Suite |
| **Harm Topic** | **Metric 1** | **Metric 2** | **Metric 3** | **Metric 4** | **Metric 5** |
| **SEPSIS** | Prior to discharge home, share information regarding signs and symptoms of infection and Sepsis at Home. Review key points regarding this info and what to be aware of and what to do if any are noticed by the patient and/or family. Be sure to provide phone numbers to call should action be necessary | Post a sepsis fact sheet in the patient room, addressing the importance of protecting yourself and family. Introduce it to the patient and family and inform them of any conditions that put the patient at higher risks for sepsis. Use teach -back to review things they can do to prevent sepsis. During daily rounds, ask the patient/family to report any potential signs/symptoms of sepsis they've noticed, as well as any preventative measures they've engaged in. | Select a member of your quality committee to spearhead a campaign emphasizing the importance of patient and family engagement in preventing sepsis. Ask the team member to highlight human impact by sharing patient and family stories as part of unit newsletters and during staff meetings. There are a collection of patient stories, FACES OF SEPSIS, on the Sepsis Alliance website | Engage your PFAC to review and redesign your signs of infection and sepsis at home materials to ensure it is personalized to your hospital and your target population. Keep what they like about the tool and use their feedback to improve the areas they feel should be changed. | Ask the team member spearheading the PFE campaign for sepsis to make a presentation to the Board - emphasizing not only the financial cost of sepsis, but underscoring the human impact, including lives lost and long term consequences to the patient and family. Invite a sepsis survivor who received care at your hospital to share his/her story, asking for the Board's support in prioritizing patient and family engagement as a key strategy for prevention. |

# GET AHEAD OF SEPSIS

## KNOW THE RISKS. SPOT THE SIGNS. ACT FAST.

**Sepsis starts outside the hospital in 80% of cases.**
Your fast recognition and treatment can increase your patients' chances of survival.

**IF ONE OR MORE** OF THE FOLLOWING SIGNS AND SYMPTOMS ARE PRESENT AND INFECTION IS SUSPECTED, THEN CONSIDER SEPSIS:

Confusion or disorientation

Shortness of breath

High heart rate

Fever, or shivering, or feeling very cold

Extreme pain or discomfort

Clammy or sweaty skin

**Gather the following information and communicate it to hospital healthcare professionals:**

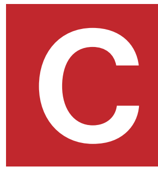
- **Medications**
- **Allergies**
- **Pre-existing conditions**
- **Other risk factors**

Learn more at **www.cdc.gov/sepsis**.

## EMS

Sepsis education, just like education for trauma, STEMI and stroke can improve EMS provider recognition, assessment, alerts and treatment to improve sepsis patient outcomes.

### CHART Mnemonic for Potential Sepsis:



**Complaints**
Do the patient's complaints indicate infection or unexplained shock?

**History**
Is the patient pre-disposed to infection or shock?

**Assessment**
Check sepsis-specific criteria

**Red Flags**
Put together clues and cues from the patient's complaints, history and assessment for a formal or informal sepsis alert

**Treatment**
System and provider specific sepsis treatment recommendations

### EMS Triage of a Patient with Suspected Sepsis:

- Sepsis is a time-critical diagnosis and EMS can play a key role in reducing time to intervention and impacting patient-centered outcomes.
- Direct Transfer to a Tertiary Care Center.
- Should EMS bypass Rural Care Facilities based on patient's sepsis screening?

## Sepsis Alert:

If Sepsis is suspected based on assessment by pre-hospital staff, a sepsis alert can be created to alert hospitals of incoming patient.

Can lead to decreased time to treatment which leads to improved mortality rates.

## Benefits of Involving EMS in the Care of Septic Patients:

Sepsis patients are transported by EMS more often than patients with acute myocardial infarctions and strokes.

First responders transport as many as 60 percent of patients with severe sepsis to the emergency department (ED).

Early recognition and initiation of treatment for sepsis are the cornerstones of patient management and improved outcomes. EMS plays a vital role in this process by recognition of suspected sepsis, initiation of treatment and advance notification to the receiving facility, allowing for more timely diagnosis and continued treatment upon arrival to the ED.

Establishing intravenous access in sepsis patients to facilitate ED interventions has shown to decrease mortality.

Initiation of fluid resuscitation by prehospital providers has been shown to decrease patient mortality rates.

**Sepsis First Responders video from the Sepsis Alliance**
https://www.youtube.com/embed/Upf8C7xSPdk

## SEPSIS: ADULT

**[ ABC's ]**
Treat/Secure as needed

**[ Assessment ]**
Vital Signs
Past/Present History
Time of Onset
Physical Exam

**[ Oxygen ]**
{As needed}
Nasal Cannula 2-6 LPM
Non-Rebreather 12-15 LPM
Bag Valve Mask 15-25 LPM

**[ Maintain SPO2 & ETCO2 ]**
{As needed}
90% Medical | ETCO2
95% Trauma | 36-45 mm/hg

## SEPSIS: EMR / EMT

### [ EMR ]

**[ Transport ]**
- Prepare patient for transport
- Place in position of comfort
- Detailed physical exam
- Contact incoming EMS unit

**** INITIATE SEPSIS ALERT ****

### [ EMT ]

- Apply Cardiac Monitor (as directed)
- Obtain 6 second strip

**[ Transport ]**
- Place in position of comfort
- Detailed physical exam
- Transport to appropriate facility
- Contact receiving facility

**** INITIATE SEPSIS ALERT ****

## AEMT / PARAMEDIC

### [ AEMT ]

- Apply Cardiac Monitor (as needed and document)

- Consider IV fluids
- Follow your Sepsis protocol

[ Transport ]
- Place in position of comfort
- Detailed physical exam
- Transport to appropriate facility
- Contact receiving facility

**** INITIATE SEPSIS ALERT ****

### [ PARAMEDIC ]

- Apply Cardiac Monitor (as needed and document)

- Consider IV fluids
- Consider Pressors
- Follow your Sepsis protocol

[ Transport ]
- Place in position of comfort
- Detailed physical exam
- Transport to appropriate facility
- Contact receiving facility

**** INITIATE SEPSIS ALERT ****

Provide ED with accurate amount of fluid administered to patient. Include time each bag was started.

## SEPSIS ALERT CRITERIA: Emergency Medical Services

Activate a Sepsis Alert if the patient is positive for SIRS, hypotensive and at least "Yes" to one of the infection criteria.

1. **SIRS (Systemic Inflammatory Response Syndrome):** SIRS positive if meets ≥ 2 criteria listed below.
   - Temperature > 100.4F or < 96.8F
   - Pulse > 90 beats/minute
   - Respiratory rate > 20 breaths/minute
2. **Hypoperfusion:** ≥ 1 of the following:
   - Systolic BP < 90
   - MAP < 65
   - Altered mental status
3. **Infection:** ≥ 1 of the following:
   - **Infections (documented or suspected):** Pneumonia, UTI, Wound Infection, Cellulitis, Decubitus Ulcers
   - **High Risk Criteria:** Nursing home, recent surgery, immuno-compromised, indwelling device, currently on antibiotics
   - **Symptoms/Exam:** cough; shortness of breath; purulent wound drainage; urinary pain/frequency; abdominal pain, distention, or firmness; stiff neck

**** INITIATE SEPSIS ALERT ****

**State *"we suspect Sepsis"* and provide:**
- **Age of patient**
- **Chief complaint**
- **Glascow Coma Score (GCS)**
- **SIRS and infection criteria**
- **Time of onset**
- **Estimated time of arrival (ETA)**

This material was prepared by the Great Plains Quality Innovation Network, the Medicare Quality Improvement Organization for Kansas, Nebraska, North Dakota and South Dakota, under contract with the Centers for Medicare & Medicaid Services (CMS), an agency of the U.S. Department of Health and Human Services. The contents presented do not necessarily reflect CMS policy. 11SOW-GPQIN-NE-SEP-7/0418

Source: Adapted from "EMS Protocols" and "Treat-before-transfer form" Wesley Healthcare, Wichita, Kansas

# PEDIATRIC SEPTIC SHOCK

**** INITIATE A SEPSIS ALERT IF: ****

Known or suspected infection and the patient meets ≥ 3 or more of the 8 clinical criteria (vital signs and exam abnormalities)

OR

Known or suspected infection and the patient meets the high-risk criteria and meets ≥ 2 of the 8 clinical criteria (vital signs and exam abnormalities)

**VITAL SIGNS**

| | < 1 month | ≥ 1 to 3 months | ≥ 3 to 12 months | ≥ 1 to 2 years | ≥ 2 to 4 years | ≥ 4 to 6 years | ≥ 6 to 10 years | ≥ 10 – 13 years | > 13 years |
|---|---|---|---|---|---|---|---|---|---|
| Heart Rate | > 205 | > 205 | > 190 | > 190 | > 140 | > 140 | > 140 | > 100 | > 100 |
| Respiratory Rate | > 60 | > 60 | > 60 | > 40 | > 40 | > 34 | > 30 | > 30 | > 16 |
| Systolic BP | < 60 | < 70 | < 70 | < 70+ (age in years x 2) | < 70+ (age in years x 2) | < 70+ (age in years x 2) | < 70+ (age in years x 2) | < 90 | < 90 |
| Temperature | < 96.8F or > 100.4F | | < 96.8F or > 101.3F | | | | | | |

**EXAM ABNORMALITIES**

| | COLD SHOCK | WARM SHOCK | NON-SPECIFIC |
|---|---|---|---|
| Pulses (central vs. peripheral) | Decreased or weak | Bounding | |
| Capillary refill (central vs. peripheral) | ≥ 3 seconds | Flash (< 1 second) | |
| Skin | Mottled, cool | Flushed, ruddy, erythroderma (other than face) | Petechiae below the nipple, any purpura |
| Mental Status | | | Decreased mental status, irritability, confusion, inappropriate crying or drowsiness, poor interaction with parents, lethargy, diminished arousability, obtunded |

**HIGH RISK CONDITIONS**

| | |
|---|---|
| High Risk Conditions | Malignancy, asplenia (including sickle cell disease), bone marrow transplant, central or indwelling line/catheter, solid organ transplant, severe developmental disability, cerebral palsy, immunodeficiency, immunocompromised or immunosuppression |

## *SEPSIS:* SPOT THE SIGNS

- Confusion or disorientation
- Fever, shivering or feeling cold
- Shortness of breath
- Fast heart rate
- Extreme pain or discomfort
- Clammy or sweaty skin

[ Criteria/Definitions ]

**SIRS (Systemic Inflammatory Response Syndrome)**: two or more of the following:

- Temperature >100.4 F or <96.8 F
- Heart rate >90 beats per minute
- Respiratory rate >20 breaths per minute
- White blood cell count: >12000/mm³ or <4000/mm³ or 10% immature bands

**Sepsis:** ≥ two or more SIRS criteria plus a suspected or confirmed infection

**Severe sepsis:** sepsis plus organ dysfunction and/or organ failure

**Septic shock:** a subset of sepsis in which particularly profound circulatory, cellular and metabolic abnormalities are associated with a greater risk of mortality than with sepsis alone.

# Long Term Care

- http://www.cdc.gov/longtermcare/

Residents in a long-term care facility have opportunities to interact with many people, from other residents and visitors to the facility employees. However, the more people who come and go, the more chances there are spread of infections.

### Common types of bugs that cause infections in long-term care facilities can include:

- MRSA
- C. Difficile
- Vancomycin-resistant Enterococcus.

### Infections; that may occur within a facility can include

- Gastroenteritis
- Influenza
- Colds

When people reside in long-term care facilities, they may need to be transported and/or admitted to a hospital if they become too ill for the long-term care facility to handle. The five most common infections that require a transfer and admission to the hospital are:

- Pneumonia
- Urinary tract infections
- Wound infections
- Meningitis
- Endocarditis

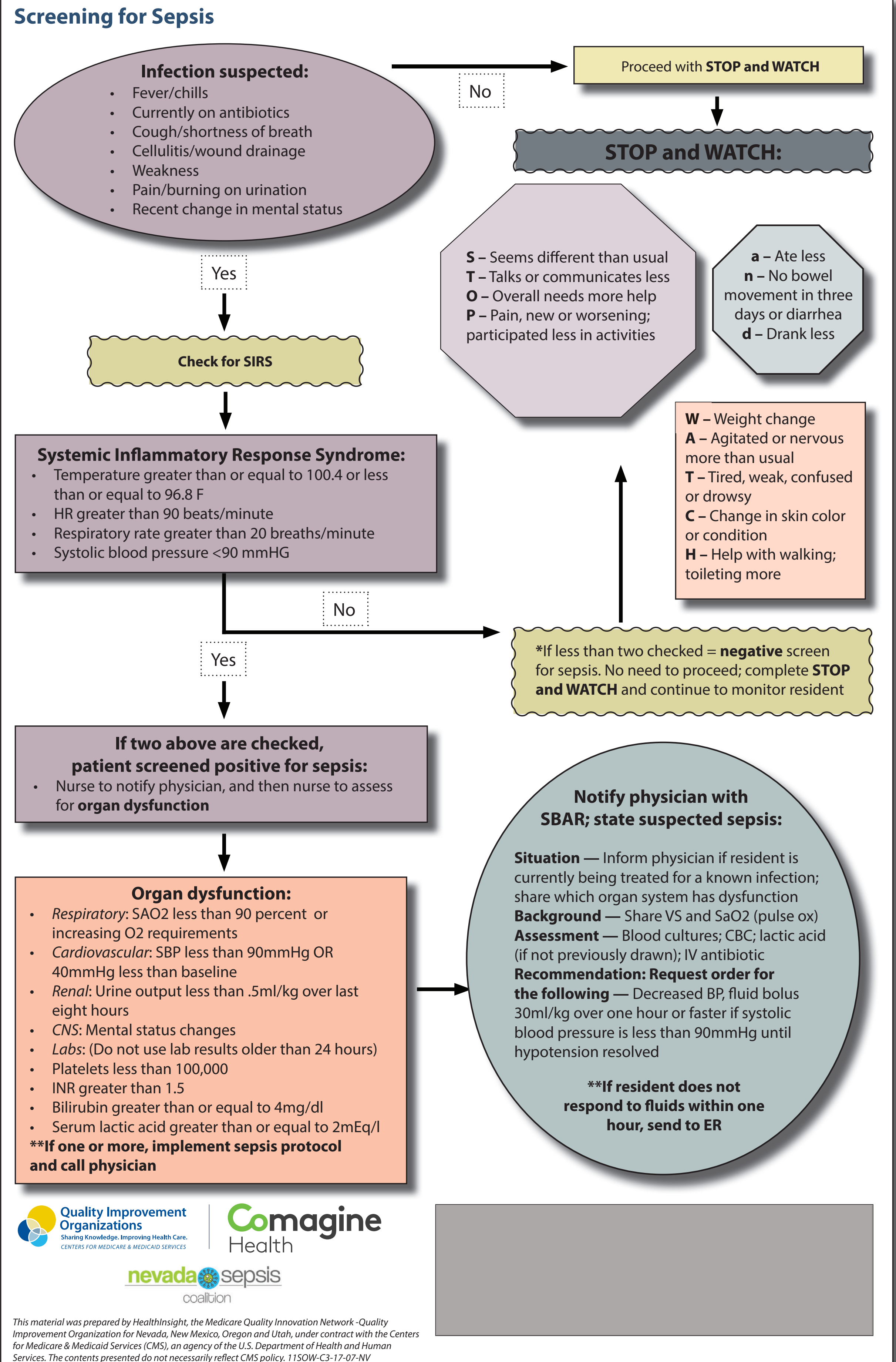
Older individuals are at an increased risk of developing sepsis. In the case of nursing homes, sepsis may come about as a result of an infected bed sore, and then may be worsened by a resident's other health issues. If not dealt with properly and promptly by nursing home personnel, sepsis may worsen and compromise the life of a resident.

To improve the clinical outcomes for their patients and based on research shows admissions from nursing homes are more likely to be for septicemia, hospitals are beginning to partner with skilled nursing (SN) and long-term care (LTC) to improve the early recognition and intervention for signs and symptoms of sepsis.

Over four million Americans are admitted to or reside in nursing homes and skilled nursing facilities each year and nearly one million persons reside in assisted living facilities. Data about infections in LTCFs are limited, but it has been estimated in the medical literature that:

- 1 to 3 million serious infections occur every year in these facilities.
- Infections include urinary tract infection, diarrheal diseases, antibiotic-resistant staph infections and many others.
- Infections are a major cause of hospitalization and death; as many as 380,000 people die of the infections in LTCFs every year.

Education



# ACT FAST!

## Early detection of SEPSIS requires fast action

If resident has suspected infection AND two or more:

- Temperature >100°F or <96.8°F
- Pulse >100
- SBP <100 mmHg or >40 mmHg from baseline
- Respiratory rate >20/SpO2 <90%
- Altered mental status

Plan for:

- Review advance directive
- Contact the physician
- Contact the family

If transferring resident to hospital:

- Prepare transfer sheet
- Call ambulance
- Call in report to hospital
- Report positive sepsis screen

If resident stays in facility, consider options below that are in agreement with resident's advance directives:

- Labs: CBC w/diff, lactate level (if able)
- UA/UC, blood cultures, as able from 2 sites, not from lines
- Establish IV access for IV 0.9% @ 30ml/kg
- Administer IV, PO or IM antibiotics
- Monitor for worsening in spite of treatment, such as:
    - Urine output <400ml in 24 hours
    - SBP <90 despite IV fluids
    - Altered mental status
- Comfort care:
    - Pain control
    - Analgesic for fever
    - Reposition every 2-3 hrs
    - Oral care every 2 hrs
    - Offer fluids every 2 hrs
    - Keep family informed
    - Adjust care plan as needed
- Consider transferring to another level of care such as palliative care, hospice or hospital

**Every hour a resident in septic shock doesn't receive antibiotics, the risk of death increases 7.6%**

**Call the doctor!**

**Is their temperature *above* 100?**

**Is their heart rate *above* 100?**

**Is their blood pressure *below* 100?**

**And does the resident just not look right? Tell the nurse, screen for sepsis and notify the physician immediately.**

Courtesy of Minnesota Hospital Association

# Intermediate care and assisted living algorithm for adults

**<u>Suspected infection *and* 2 or more SIRS criteria</u>**

| **Suspected infection** | **SIRS criteria** |
|---|---|
| Fever/chills | Temp ≥100.0 or ≤96.8 |
| Currently on antibiotics | Pulse ≥100 |
| Cough/SOBS | BP <100 or >40 mmHg from baseline |
| Cellulitis/wound drainage | Resp. rate >20/SpO2 <90% |
| Weakness | Altered mental status |

SIRS = Systemic Inflammatory Response Syndrome

**Early detection tool 100-100-100**

NO → **Negative screen for sepsis**

YES → **Positive screen for sepsis**

**<u>Prior to calling provider</u>**

- **Educate resident/family about status**
- **Review Advance Directives and options**

**Notify provider**

**<u>Transfer</u>**

- Prepare transfer sheet
- Call ambulance
- Call report to hospital
- *Report positive sepsis screen*

**<u>Stay in facility</u>**

***If Advance Directives and/or resident's wishes are in agreement, consider some or all of following order options:***

- Administer new oral antibiotics
- Encourage oral fluid intake
- Comfort care

**<u>Monitor for progression into *Multisystem Organ Dysfunction Syndrome*</u>**

Examples

- Progression of symptoms despite treatment
- Altered mental status

Consider transferring to another level of care - hospital, SNF, palliative or hospice)

## Comfort care

- Pain control
- Analgesic for fever
- Reposition every 2-3 hrs
- Oral care every 2 hrs
- Keep family informed
- Adjust care plan as needed

Courtesy of Minnesota Hospital Association

# Severe sepsis and septic shock

## *Care of the resident*

| OUTCOME | DEFINITION DISTINCTIONS |
|---|---|
| Symptom Identification | • Initiate the 100, 100, 100 rule staff screen.<br>• Symptoms: Just don't look right. Resident weak, more confused, and have other symptoms of infection<br>  ○ Urinary Tract = frequency, urgency, burning on urination, or pain<br>  ○ Respiratory = cough, shortness of breath, increase in sputum<br>  ○ Skin = draining wound, redness, swelling, and warm to touch<br>  ○ Neurologic = confusion, headache, stiff neck and sensitivity to light<br>• Notify the Registered Nurse<br>• Identify Advance Directive Wishes<br>• Notify the Physician<br>• Call Family |
| Advance Directives | • Verify Resident Wishes<br>  ○ No treatment<br>  ○ Treat and do not transfer<br>  ○ Comfort Care |
| Initial LTC bundle Based off Level of Care and Ability | • Obtain Cultures and Blood for Lactate Level<br>• Start IV and give fluids<br>• Start Antibiotics |
| Transfer Trigger | • Identify resident /family wishes to treat in acute care hospital<br>• Transfer Triggers<br>  ○ Lactate greater than 4<br>  ○ Persistent hypotension despite fluid resuscitation<br>  ○ Evidence of organ dysfunction<br>  ○ Progression of symptoms |

| PROCESS | |
|---|---|
| Surviving Sepsis Campaign's 3- and 6-hour Bundles: | |
| **WITHIN 3 HOURS:**<br>• Measure lactate level.<br>• Obtain blood cultures prior to administration of antibiotics.<br>• Administer broad spectrum antibiotics.<br>• Administer 30 ml/kg crystalloid (0.9% Sodium Chloride) for hypotension or lactate ≥4mmol/L.<br>• Identify resident wishes to be transferred for care. | **Advance Directive Bundle:**<br>• Treatment status<br>• Code Status<br>• Comfort Care Status<br>  ○ Analgesic for fever<br>  ○ Pain Control |
| **ADDITIONAL PROCESSES** | |
| • Percent antibiotics administered w/in 1 hour of triage (= first set of vital signs) or w/in 1 hour of Code Sepsis activation.<br>• Serum lactate w/in either 3 hours of triage or w/in 3 hours of Code Sepsis activation.<br>• Adherence to Sepsis Transfer Protocol within appropriate time frame.<br>• Adherence to Sepsis Trigger Tool.<br>• Advance Directive. | |

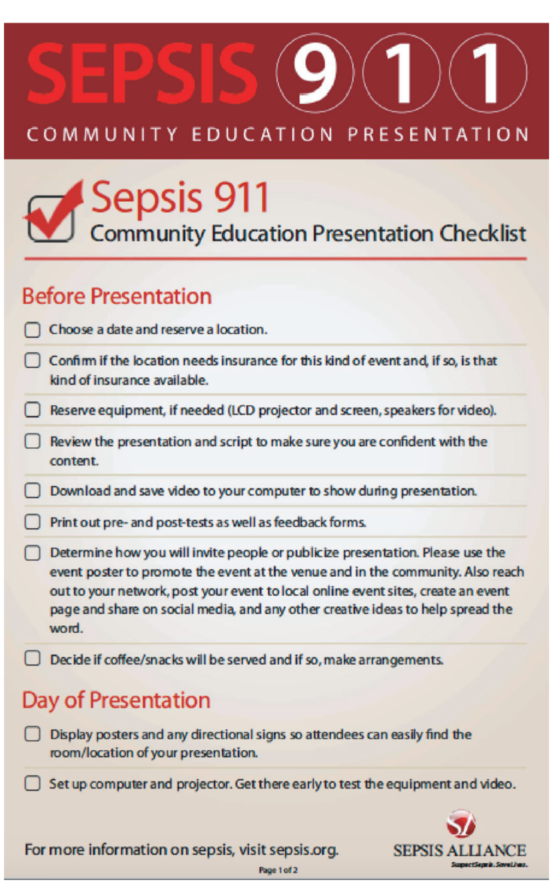
Courtesy of Minnesota Hospital Association

# Tools for Community Education

Great downloadable, free resource for community education via Sepsis Alliance at www.sepsis.org.

SEPSIS 911

COMMUNITY EDUCATION PRESENTATION



SEPSIS 911

COMMUNITY EDUCATION PRESENTATION

Sepsis 911

Community Education Presentation Checklist

Before Presentation

- ☐ Choose a date and reserve a location.
- ☐ Confirm if the location needs insurance for this kind of event and, if so, is that kind of insurance available.
- ☐ Reserve equipment, if needed (LCD projector and screen, speakers for video).
- ☐ Review the presentation and script to make sure you are confident with the content.
- ☐ Download and save video to your computer to show during presentation.
- ☐ Print out pre- and post-tests as well as feedback forms.
- ☐ Determine how you will invite people or publicize presentation. Please use the event poster to promote the event at the venue and in the community. Also reach out to your network, post your event to local online event sites, create an event page and share on social media, and any other creative ideas to help spread the word.
- ☐ Decide if coffee/snacks will be served and if so, make arrangements.

Day of Presentation

- ☐ Display posters and any directional signs so attendees can easily find the room/location of your presentation.
- ☐ Set up computer and projector. Get there early to test the equipment and video.

For more information on sepsis, visit sepsis.org.

SEPSIS ALLIANCE

Page 1 of 2

- Sepsis Alliance
- www.sepsis.org
- Event checklist
- Posters to advertise
- PowerPoint presentation
- Presentation script
- Attendee quiz, survey

# Resources:

**American College of Emergency Physicians DART**

https://www.acep.org/DART/

**CDC Healthcare Professional Information**

https://www.cdc.gov/sepsis/education/hcp-resources.html

https://lhatrustfunds.com/toolkit/sepsis-toolkit/

**CDC Sepsis Information**

https://www.cdc.gov/sepsis/

**CDC Hospital Toolkit**

https://www.cdc.gov/sepsis/pdfs/Sepsis-Surveillance-Toolkit-Aug-2018_508.pdf

**CMS Measures Inventory Tool - Severe Sepsis and Septic Shock: Management Bundle**

https://cmit.cms.gov/CMIT_public/ViewMeasure?MeasureId=1017#tab1

**EMS Resource: two sepsis videos provided by CDC**

https://www.cdc.gov/sepsis/education/hcp-resources.html

**EMS Sepsis Alert**

https://www.jems.com/2016/08/31/sepsis-early-recognition-and-treatment-in-prehopsital-setting-vital-for-patient-outcomes/

**Hospital Toolkit for Adult Sepsis Surveillance**

https://www.cdc.gov/sepsis/pdfs/Sepsis-Surveillance-Toolkit-Mar-2018_508.pdf link only

**Long-Term Care Sepsis Toolkit**

https://healthinsight.org/component/jdownloads/send/367-sepsis/1795-sepsis-toolkit-guide-for-skilled-nursing-and-long-term-care

**Nurse-Driven Protocol for Sepsis**

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5225612/

https://www.uclahealth.org/sepsis/materials-resources-for-clinicians

**Sepsis:**

https://www.who.int/news-room/fact-sheets/detail/sepsis

**Sepsis Alliance**

https://www.sepsis.org/

**Sepsis Alliance Patient and Family Resources**

https://www.sepsis.org/education/patients-family/ link

**Sepsis Alliance – Post Sepsis Syndrome**

https://www.sepsis.org/sepsis-basics/post-sepsis-syndrome/

**Sepsis Alliance Resources**

https://www.sepsis.org/education/resources/

**Sepsis Alliance Webinar Series**

https://www.sepsis.org/education/providers/webinar-series/

**Sepsis Coordinator Network**

https://www.sepsiscoordinatornetwork.org/

**Sepsis Practice Collaborative Model**

https://www.sepsiscoordinatornetwork.org/wp-content/uploads/2018/09/Sepsis-Gap-Analysis-Results-and-Next-Steps-at-Your-Facility-Aug-2018AllSlides.pdf

**Sepsis Rapid Response Teams**

https://www.ncbi.nlm.nih.gov/pubmed/29482904

**Surviving Sepsis Campaign Resource Library**

https://www.sccm.org/SurvivingSepsisCampaign/Resources/Resource-Library

**Sepsis Toolkit for Skilled Nursing and LTC**

https://healthinsight.org/component/jdownloads/send/367-sepsis/1795-sepsis-toolkit-guide-for-skilled-nursing-and-long-term-care

**World Health Organization. (2019, January 11). World Health Organization. Retrieved from Factsheets Detail**

Carmen Polito, MD, Polito, C.C. MD. 2016 Southeastern Critical Care Summit. (2016). Prehospital identification and management of sepsis. Available at https://www.youtube.com/watch?v=pk1CNflC-WU28 link to video

### The following video boldly illustrates the potential severity and lasting effects of Sepsis:

https://www.youtube.com/watch?v=0KtR93zhkhU#action=share 16 min video of experience of Jay and Sue Stull and narrated by Dr Steven Simpson MD, Professor of Pulmonology & Critical Care Medicine, University of Kansas

## COVID-19 Resources

**Sepsis Alliance**

https://www.sepsis.org/education/resources/coronavirus-covid-19/

**Society of Critical Care Medicine**

https://www.sccm.org/getattachment/SurvivingSepsisCampaign/Guidelines/COVID-19/SSC-COVID-19-Guidelines.pdf?lang=en-US

**Surviving Sepsis Campaign**

https://sccm.org/SurvivingSepsisCampaign/Guidelines/COVID-19

Notes

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