Sepsis Management
UCLA Health

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Clinical Quality Improvement Specialist
Sepsis Project Manager
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Background

• UCLA Health – An academic medical center that includes acute care inpatient services, ambulatory clinics, urgent care centers, and psychosocial services.

• Bed Capacity
  - Ronald Reagan – 520
  - Santa Monica – 266

• Daily ED Patient Flow
  - Ronald Reagan - 155
  - Santa Monica – 145

• At UCLA Health, we are building an interdisciplinary team that will work together to improve patient outcomes.
• M – Mortality
• O – Outcomes
• V – ValU
• E – Patient Experience
• R – Reduce Readmissions
• S – Patient Safety
Background

Severe sepsis affects more than 1 million Americans/year

- 28-50% mortality rate

Bundle compliance ↑, mortality rates ↓

Surviving Sepsis Campaign

- Global initiative to improve sepsis mortality rates
- Defines standards of care to treat severe sepsis and septic shock
DSRIP (Delivery System Reform Incentive Payments)

DSRIP sepsis guidelines

• Pay for Performance Initiative – 21 CA hospitals receive Medicaid dollars for reaching pre-set milestones
  • Based on guidelines from Surviving Sepsis Campaign and Society of Critical Care Medicine

Goal = 55% bundle compliance by July 2015

• 4 elements required
  • Lactate
  • BC x 2 sets
  • IV broad spectrum abx
  • IVF bolus
DSRIP Criteria

**Severe Sepsis Criteria**

- 2 SIRS
  - + Infection – Suspected or Confirmed
  - + New Onset Organ Failure or Dysfunction

**Septic Shock Criteria**

- Severe Sepsis
  - + Hypotension (SBP < 90) and/or ↑ Lactate (≥ 4)
Beginning with October 1, 2016 Discharges

Severe Sepsis Criteria

- 2 SIRS
- + Infection – Suspected or Confirmed
- + New Onset Organ Failure or Dysfunction

Septic Shock Criteria

- Severe Sepsis
- + Persistent Hypotension and/or Lactate (≥4)
Sepsis Improvement Team Structure

• Sepsis Physician Champions
  • Health System
  • Unit Level
• Project Managers, Health System
  • Mortality
  • Sepsis
• Sepsis Executive Committee
• Quality Management Services - QMS
• Sepsis Champions
• PI Project Teams
Sepsis Core Measures Process Map

SEVERE SEPSIS & SEPTIC SHOCK: EARLY MANAGEMENT BUNDLE

1 HOUR

- Blood cultures X 2 sets
  - per nursing protocol
  - no co-sign required
  - *NOTE: 4 bottles total; minimum of 8-10mL per bottle

- Document POSITIVE severe sepsis &/or septic shock screen in CareConnect

- NURSES

- Initial Lactate Level
  - per nursing protocol
  - no co-sign required

- If initial lactate > 18mg/dl
  - redraw within 3 hours after initial lactate

- Complete within 1 HOUR (max)
  - Following initial time of presentation (TOP)

- Initiate Severe Sepsis &/or Septic Shock Bundle
  - (per adult sepsis nursing protocol & core measure requirements)

- NURSES &/or MD/NP/PA

- Administer IV broad spectrum antibiotic or other approved combination of antibiotics
  - (RN to contact MD/NP/PA to request orders for IV ABLx & fluid bolus)

- If SBP <90 or >140 below baseline or MAP <65
  - or Initial lactate level >20mg/dL

- Complete within 1 HOUR (max)
  - Following initial time of presentation (TOP)

- Complete within 6 HOURS (max)
  - Following initial time of presentation (TOP)

- If initial lactate > 18mg/dl
  - repeat LACTATE level per nursing protocol
  - if most recent lactate level >18mg/dL

- Repeat serum lactate level per nursing protocol
  - if most recent lactate level >18mg/dL

- Initiate VASOPRESSORS (contact MD/NP/PA for orders)
  - Vasopressors to be initiated for hypotension unresponsive to fluid bolus of 30mL/kg

- AND

- Repeat volume & tissue perfusion assessment
  - including (ALL must be documented by MD/NP/PA):
    - Complete Vital Signs, AND
    - Cardiovascular exam, AND
    - Capillary refill evaluation, AND
    - Peripheral pulse evaluation, AND
    - Skin exam
    - OR - Any two of the following:
      - Central venous pressure (CVP) measurement
      - Central venous oxygen (sCVO2) measurement
      - Bedside cardiovascular ultrasound
      - Pulsed leg noise or fluid challenge 500mL NS/LR (min.)
Sepsis Core Measures Process Map

Pt meets criteria for Severe Sepsis &/or Septic Shock
(Time of Presentation or TOP)

Document POSITIVE severe sepsis &/or septic shock
screen in CareConnect

COMPLETE WITHIN 1 HOUR (max)
Following initial time of presentation (TOP)

Initial Lactate Level
(per nursing protocol, no co-sign required)

Blood Cultures X 2 sets
(per nursing protocol, no co-sign required)
*NOTE: 4 bottles total; minimum of 8-10mL per bottle

1 HOUR
Sepsis Core Measures Process Map

Initiate Severe Sepsis &/or Septic Shock Bundle (per adult sepsis Nursing protocol & core measure requirements)

*RN to contact MD/NP/PA to request orders for IV Abx & fluid bolus*

Administer IV broad spectrum antibiotic or other approved combination of antibiotics
(RN to contact MD/NP/PA to request orders for Abx)

If SBP <90 or >40 below baseline or MAP <65

-OR-

Initial Lactate level ≥36mg/dL

Total bolus minimum of 30mL/kg must complete in <3hrs from TOP; Administer only 0.9% NS or LR fluids

RN &/or MD/NP/PA

Changes & Updates highlighted in RED
REV 11/24/2015
COMPLETE WITHIN 6 HOURS (max)
Following initial time of presentation (TOP)

If initial lactate > 18mg/dl, redraw within 3 hours after initial lactate

REPEAT serum Lactate level per nursing protocol if most recent lactate level >18mg/dL
Sepsis Core Measure Process Map

Initiate VASOPRESSORS (contact MD/NP/PA for orders)
Vasopressors to be initiated for hypotension unresponsive to fluid bolus of 30mL/kg

AND

Repeat volume & tissue perfusion assessment including (ALL must be documented by MD/NP/PA):
- Complete Vital Signs, AND
- Cardiopulmonary exam, AND
- Capillary refill evaluation, AND
- Peripheral pulse evaluation, AND
- Skin exam
  - OR -
Any two of the following:
- Central venous pressure (CVP) measurement
- Central venous oxygen (sCVO2) measurement
- Bedside cardiovascular ultrasound
- Passive leg raise or fluid challenge 500mL NS/LR (min.)

If hypotension persists within 1 hour of completing 30mL/kg fluid bolus, continue interventions. If pt. no longer hypotensive after 30mL/kg, STOP!

If INITIAL Lactate is ≥36mg/dL, MUST perform repeat volume & tissue perfusion assessment (regardless of repeat Lactate level results)
Sepsis Continuum

SEPSIS: Defining a Disease Continuum

SIRS
- Any ≥ 2 of the following:
  - Temp > 38.5°C (101.3°F) or < 35°C (95.0°F)
  - HR > 90/minute
  - RR > 20/minute
  - WBC > 12,000 or < 4,000 or >10bands

SEPSIS
- ≥ 2 SIRS (+) possible, suspected or confirmed infection (e.g., UTI, PNA, wound infection, implantable device infection)

Severe Sepsis*
- Sepsis (+) NEW or ACUTE onset organ dysfunction &/or failure (examples below) OR provider documentation of severe sepsis

Septic Shock**
- Severe Sepsis (+) hypotension (SBP < 90, MAP < 65 or <40mm/Hg) OR lactate ≥ 36mg/dL OR provider documentation of septic shock

- (**) Severe Sepsis – Follow-up
  - If initial lactate > 18, repeat lactate within 3 hours after initial lactate

- (**) Septic Shock – Implement bundle within 1 hour of TOP
  - Initiate all elements required for Severe Sepsis plus:
    - Administer IVF bolus of 0.9% NS or LR 30ml/kg (complete within 3 hours of TOP)
    - If hypotension persists within 1 hour of completion of IVF bolus, administer vasopressors and MD/NP/PA performs repeat volume and tissue perfusion assessment.
    - If initial lactate ≥ 36, MD/NP/PA performs repeat volume and tissue perfusion assessment.

For additional details, see Process Map of Severe Sepsis & Septic Shock: Early Management Bundle

Organ Dysfunction

- Organ Dysfunction is a chronic disease or medication may not apply
  - Cardiovascular: Systolic BP < 90 OR MAP < 65 OR decrease by > 40mmHg from baseline for patient ≥ 65
  - Respiratory: New need for mechanical ventilation or BiPAP
  - Renal: Creatinine > 2.0 OR urine output < 0.5mL/kg/hr for 2 hours
  - Hematologic: Platelets < 100,000 OR INR > 1.5 (not on Warfarin) OR aPTT > 80 sec
  - Hepatic: Bilirubin > 2.0
  - Metabolic: Lactate > 18 mg/dL = (***) Sepsis
    - Lactate ≥ 36 = (***Septic Shock
  - Neurologic: Altered mental status OR decrease LOC OR decrease GCS

Resources

- UCLA Sepsis Website [link]
- Nurses - use UCLA Adult Sepsis Nursing Protocol & Sepsis Nursing Lab Panel in CareConnect to initiate severe sepsis/septic shock bundle for ALL patients ≥18yrs. meeting severe sepsis &/or septic shock criteria
- How to use Lab Panel - “Manage Orders,” Type in “Sepsis.” Select “Sepsis Nursing Order Panel,” and choose “No co-sign needed” Nurse Driver Protocol:
  - [link]
- MD/NP/PA - use Adult Sepsis Order Set in CareConnect for ≥18yrs.
# Sepsis Order Set

**Adult Sepsis Focused Order Set Manage My Version**

For adults with normal renal function.
1. Measure lactate level.
2. Obtain blood cultures x 2 prior to administration of antibiotics.
3. Administer broad spectrum antibiotics within one (1) hour of sepsis presentation or positive sepsis screen.
4. Administer 30 mL/kg crystalloid for hypotension and/or lactate 36 mg/dL.

**Surviving Sepsis Campaign**

<table>
<thead>
<tr>
<th>Section</th>
<th>Items</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General</strong></td>
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<tr>
<td><strong>Labs</strong></td>
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<td><strong>Microbiology</strong></td>
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<td>1 of 1 selected</td>
</tr>
<tr>
<td><strong>IV Fluids</strong></td>
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<td>0 of 2 selected</td>
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</tbody>
</table>

**Vital Signs**
- Maintain Mean Arterial Pressure (MAP) > 85 mmHg
  - Routine. Until discontinued starting Today at 1320 Until Specified

**Nursing**
- Antibiotics must be administered within 1 hour of sepsis identification and after cultures have been obtained
  - Routine. Until discontinued starting Today at 1320 Until Specified
  - Antibiotics must be administered within 1-hour of sepsis identification

**Now Labs**
- Lactate
  - STAT, Once First occurrence Today at 1320
  - Vein
  - Redraw Lactate 3 hours after 1st lactate level if first lab result is >10 mg/dL. Discontinue order if not applicable
  - STAT, Once - Starting in 3 hours First occurrence Today at 1620

**Microbiology**
- Blood Cultures x 2 from different sites
  - Blood culture #1
    - STAT, Once First occurrence Today at 1320
    - Central Line
  - Blood culture #2
    - STAT, Once First occurrence Today at 1320
    - Peripheral

**IV Fluids**
- IV Fluids
- IV Fluid Bolus
Sepsis Order Sepsis – Crystalloid Fluid Bolus

Administer 31 mL/kg for Severe Sepsis/Septic Shock Bundle if clinically indicated.

Administer Amount: 2,480 mL

Administer Over: 5 Minutes

Infuse bolus at least at a rate greater than 125 mL/hr.
Sepsis Screening Tool - ED

### Sepsis Screening

**Within the past 12 hours prior to RN assessment, does the patient have:**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature &lt; 36 or &gt; 38.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HR &gt; 90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RR &gt; 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WBC &lt; 4,000 or &gt; 12,000 or &gt; 10% bands</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SIRS Criteria:**
- T > 38.3 degrees C (101 degrees F) OR < 36 degrees C (96.8 degrees F)
- HR > 90
- RR > 20
- WBC > 12,000 OR < 4,000 OR > 10% Bands

**Suspected/Confirmed infection/compromised immune system, an indwelling catheter or central line?**

- Yes
- No

**Examples:**
- UTI
- Pneumonia
- Wound infection
- Elevated WBC’s, etc.
- HemOnc or Rx of solid organ/BM transplant
- Long-term steroid use or immune suppression meds

**Within the past 12 hours prior to RN assessment, does the patient have:**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBP &lt; 90 or MAP &lt; 65 or Decrease by 40mmHg from baseline for PI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Need for Mechanical Ventilation or BiPAP</td>
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<tr>
<td>Altered Mental Status or Decreased LOC or decreased GCS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lactate &gt; 10mg/dl</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creatinine &gt; 2.0 or Urine Output &lt; 0.5mL/kg/hr for 2 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bilirubin &gt; 2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Platelets &lt; 100,000 or INR &gt; 1.5 (not on Warfarin) or aPTT &gt; 60 sec</td>
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<td></td>
</tr>
</tbody>
</table>

**Examples of organ system dysfunction or failure (Organ Dysfunction not chronic disease or medication does not apply):**
- Cardiac: Systolic BP < 90 OR MAP < 65 OR decrease by > 40mmHg from baseline for patient = (\*)Severe Shock
- Respiratory: New need for mechanical ventilation or BiPAP
- Renal: Creatinine > 2.0 OR urine output < 0.5mL/kg/hr for 2 hours
- Hematologic: Platelets < 100,000 OR INR > 1.5 (not on Warfarin) OR aPTT > 60 sec
- Hepatic: Bilirubin > 2.0
- Metabolic: Lactate > 10 mg/dl = (\*)Severe Sepsis
- Neurological: Altered Mental Status OR decrease LOC OR decrease GCS

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UCLA Health
Sepsis Screening Tool - Inpatient

**Sepsis Screen - Sepsis Admission Assessment**

- **SUSPECTED/CONFIRMED infection/compromised immune system, an indwelling catheter or central line?**
  - Yes
  - No

**EXAMPLES:**
- UTI
- Pneumonia
- Wound Infection
- Elevated WBC’s, etc.
- Hem/One or Hx of solid organ/BM transplants
- Long-term steroid use or immune suppression meds

**>/= 2 signs of SIRS?**
- Yes
- No

**SIRS Criteria:**
- T >38.3 degrees C (101 degrees F) OR <36 degrees C (96.8 degrees F)
- HR >90
- RR >20
- WBC >12,000 OR <4,000 OR >10% Bands

**>/= 1 sign of organ system dysfunction or failure (not chronic)?**
- Yes
- No

**EXAMPLES of organ system dysfunction or failure (Organ Dysfunction r/t chronic disease or medication does not apply):**
- Cardiovascular: Systolic BP <90 OR MAP <65 OR decrease by >40mmHg from baseline for patient = (I)Septic Shock
- Respiratory: New need for mechanical ventilation or BiPAP
- Renal: Creatinine >2.0 OR urine output <0.5mL/kg/hr for 2 hours
- Hematologic: Platelets <100,000 OR INR >1.5 (not on Warfarin) OR aPTT >50 sec
- Hepatic: Bilirubin >2.9
- Metabolic: Lactate >18 mg/dL = (*)Severe Sepsis
  - Lactate greater than or equal to 36 = (**)Septic Shock
- Neurological: Altered Mental Status OR decrease LOC OR decrease GCS
Sepsis Screening Tool - Flowsheet

Sepsis Screen - "Complete ALL Sepsis screening questions once per shift." - This shift, or within the past 12 hours prior to RN assessment, does patient have:

- SUSPECTED/CONFIRMED infection/compromised immune system, an
- >/= 2 signs of SIRS?
- >/= 1 sign of organ system dysfunction or failure (not chronic)?
- Severe Sepsis/Septic Shock Screen:
- Interventions

MD Notified
Nurse Driven Protocol

• Based on Positive Severe Sepsis/Septic Shock Screen
• Use Nurse Order Set
  • Lactate
  • Repeat Lactate
  • Blood Cultures x 2 Sets
  • Notify provider and request order for IV abx and fluids if needed
Sepsis Nurse Order Set

**Sepsis Nursing Order Panel**

4 of 4 selected

**Bacterial Culture** Blood

- **P** STAT, Once First occurrence Today at 1310

**Bacterial Culture** Blood

- **P** STAT, Once First occurrence Today at 1310

**Lactate**

- **P** STAT, Once First occurrence Today at 1310

**Vein**

Redraw Lactate 3 hours after 1st lactate level if first lab result is >18 mg/dl. Discontinue order if not applicable.

Routine, Once - Starting in 3 hours First occurrence Today at 1610
MOVING Forward to Success

• Sepsis BPA
• Early Recognition and Response Team
• Sepsis Champions
  • Spread Education to Units
  • Bring Ideas for Process Improvement to Committee
• Case Analysis
  • Improve Bundle Compliance
  • Identify Process Improvement Opportunities
Question?

SMaxwell@mednet.ucla.edu
http://sepsis.mednet.ucla.edu