2018 Sepsis Measure Specifications: Adult Time Zero Severe/Shock

3-Hour Bundle: The percentage of discharges in calendar year 2018 for which all components of the 3-hour bundle were satisfied by the hospital.

Composite Measure Bundle: The percentage of discharges in calendar year 2018 for which all components of the composite bundle were satisfied by the hospital. The composite includes the 3-hour bundle.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Relevant Data Dictionary Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Denominator</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Inclusions</strong></td>
<td></td>
</tr>
</tbody>
</table>
| • All cases except cases removed by the exceptions | • Same PCN but different MRN or UPI  
• Same MRN but different UPI or DOB  
• Duplicated or Overlapped Visits  
• Incorrect Date or Datetime (wrong datetime format or discharge time before or on admission time) |
| **3-Hour Exclusions** |  |
| • Discharges for patients whose age < 18 | • Admission Datetime – Date of Birth < 18 yrs  
• (Severe Sepsis Time Not Null -OR- Septic Shock Time Not Null) -AND- Excluded Time Not Null -AND- time interval between Excluded Time and the minimum of Severe Sepsis Time and Septic Shock Time not greater than 3 hr (Excluded Time – min(Severe Sepsis Time, Septic Shock Time) ≤ 3 hr) |
| • 3-hour exclusions: Discharges where patient was excluded from protocol within 3 hours of time zero  
• Earliest of severe sepsis/septic shock is used to determine time. |  |
| • 3-hour expired exclusions: Discharges where patient died within 3 hours of time zero  
• Earliest of severe sepsis/septic shock is used to determine time. |  |
| • 3-hour exclusions: Antibiotics Administration Time between 72 and 24 hours prior to time zero  
• Earliest of severe sepsis/septic shock is used to determine time. | • Antibiotic Administration Time Not Null and Antibiotic Administration = 1 -AND-  
• (Severe Sepsis Time Not Null -OR- Septic Shock Time Not Null) -AND- Discharge Time Not Null -AND- Discharge Status = 20 -AND- time interval between Discharge Time and the minimum of Severe Sepsis Time and Septic Shock Time not greater than 3 hr (Discharge Time – min(Severe Sepsis Time, Septic Shock Time) ≤ 3 hr)  
• (Severe Sepsis Time Not Null -OR- Septic Shock Time Not Null) -AND- time interval between Antibiotic Administration Time |
### 2018 Sepsis Measure Specifications: Adult Time Zero Severe/Shock

<table>
<thead>
<tr>
<th>Denominator/Exclusion/Numerator</th>
<th>and the minimum of Severe Sepsis Time and Septic Shock Time between 72 and 24 hr before (-72 hr &lt; Antibiotic Administration Time – min(Severe Sepsis Time, Septic Shock Time) &lt; -24 hr)</th>
</tr>
</thead>
</table>
| **Denominator:**              | • Initial Lactate Level Collection  
• Antibiotic Administration  
• Blood Culture Collection |
| **Numerator:**                | • All cases except cases dropped by **3-Hour Exclusions** |
|                               | • Initial Lactate Level Collection = 1 -AND- Initial Lactate Level Collection Time Not Null -AND-  
• (  
• (Severe Sepsis Time Not Null -OR- Septic Shock Time Not Null) -AND- time interval between Initial Lactate Level Collection and the minimum of Severe Sepsis Time and Septic Shock Time not more than 6 hr before and not greater than 3 hr (-6 hr \leq Initial Lactate Level Collection Time – min(Severe Sepsis Time, Septic Shock Time) \leq 3 hr)  
• )  
• Antibiotic Administration = 1 -AND- Antibiotic Administration Time Not Null -AND-  
• (  
• (Severe Sepsis Time Not Null -OR- Septic Shock Time Not Null) -AND- time interval between Antibiotic Administration Time and the minimum of Severe Sepsis Time and Septic Shock Time not more than 24 hr before and less than 0 (-24 hr \leq Antibiotic Administration Time – min(Severe Sepsis Time, Septic Shock Time) < 0) -OR-  
• (Severe Sepsis Time Not Null -OR- Septic Shock Time Not Null) -AND- Antibiotic Administration Selection = 1 -AND- time interval between Antibiotic |

| **Numerator:**                | • Initial Lactate Level Collection within 3 hours of time zero  
• Earliest of severe sepsis/septic shock is used to determine time.  
• If the antibiotic is before time zero then antibiotic administration selection is not required. If antibiotic is on or after time zero then antibiotic administration selection is required. |
## 2018 Sepsis Measure Specifications: Adult Time Zero Severe/Shock

<table>
<thead>
<tr>
<th>Numerator:</th>
<th>Administration Time and the minimum of Severe Sepsis Time and Septic Shock Time not less than 0 and not greater than 3 hr ($0 \leq \text{Antibiotic Administration Time} - \min(\text{Severe Sepsis Time, Septic Shock Time}) \leq 3$ hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Blood Culture Collection prior to antibiotics and within 3 hours of time zero</td>
<td>• Blood Culture Collection = 1 AND Blood Culture Collection Time Not Null AND ([Antibiotic Administration Time Not Null AND (time interval between Antibiotic Administration Time and Blood Culture Collection Time not less than 0 (Antibiotic Administration Time - Blood Culture Collection Time $\geq 0$) OR (time interval between Antibiotic Administration Time and Blood Culture Collection Time less than 0 (Antibiotic Administration Time - Blood Culture Collection Time &lt; 0) -AND- Blood Culture Acceptable Delay = 1)) OR (Antibiotic Administration = 2 AND Blood Culture Collection = 1)]) -AND-</td>
</tr>
<tr>
<td>• Earliest of severe sepsis/septic shock is used to determine time.</td>
<td>(</td>
</tr>
<tr>
<td>• This allows for antibiotic to be before blood culture if there is a blood culture acceptable delay.</td>
<td>(Severe Sepsis Time Not Null OR Septic Shock Time Not Null) AND time interval between Blood Culture Collection Time and the minimum of Severe Sepsis Time and Septic Shock Time not more than 48 hr before and not greater than 3 hr ($-48 \leq \text{Blood Culture Collection Time} - \min(\text{Severe Sepsis Time, Septic Shock Time}) \leq 3$ hr)</td>
</tr>
<tr>
<td>• This allows if antibiotic never done but blood culture was done within 3 hours.</td>
<td>)</td>
</tr>
<tr>
<td>• 6-hour exclusion or expired: Repeat Lactate Level Collection within 6 hours of time zero</td>
<td>(</td>
</tr>
<tr>
<td>• Earliest of severe sepsis/septic shock is used to determine time.</td>
<td>(Severe Sepsis Time Not Null OR Septic Shock Time Not Null) AND Excluded Time Not Null AND time interval between Excluded Time and the minimum of Severe Sepsis Time and Septic Shock Time not greater than 6 hr ($\text{Excluded Time} - \min(\text{Severe Sepsis Time, Septic Shock Time}) \leq 6$ hr)</td>
</tr>
</tbody>
</table>

Prepared by the Office of Quality and Patient Safety 05/31/2018
### 2018 Sepsis Measure Specifications: Adult Time Zero Severe/Shock

#### Denominator:
- **Repeat Lactate Level Collection**
- First exclude all 3-hour exclusions and then exclude cases that are in 6-hour exclusions of Repeat Lactate Level Collection.
- After exclusions, select cases that are repeat lactate required as denominator.
  - Initial lactate > 2
  - Elevated lactate reason = 2

#### Numerator:
- **Repeat Lactate Level Collection** within 6 hours of time zero
- Earliest of severe sepsis/septic shock is used to determine time.

- ) -OR-
- (Severe Sepsis Time Not Null -OR- Septic Shock Time Not Null) -AND- Discharge Time Not Null -AND- Discharge Status = 20 -AND- time interval between Discharge Time and the minimum of Severe Sepsis Time and Septic Shock Time not greater than 6 hr (Discharge Time – min(Severe Sepsis Time, Septic Shock Time) ≤ 6 hr)
- )

- All cases except cases dropped by 3-Hour Exclusions and the exclusions of Repeat Lactate Level Collection -AND-
- (Initial Lactate Level Not Null -AND- Initial Lactate Level > 2 mmol/L -AND- Elevated Lactate Reason = 2 )

- (Initial Lactate Level Not Null -AND- Initial Lactate Level > 2 mmol/L -AND- Elevated Lactate Reason = 2) -AND- Repeat Lactate Level Collection = 1 -AND-

- (Severe Sepsis Time Not Null -OR- Septic Shock Time Not Null) -AND- Repeat Lactate Level Collection Time Not Null -AND- time interval between Repeat Lactate Level Collection Time and the minimum of Severe Sepsis Time and Septic Shock Time not less than 0 and not greater than 6 hr (0 ≤ Repeat Lactate Level Collection Time – min(Severe Sepsis Time, Septic Shock Time) ≤ 6 hr)
- )
New Time variable defined: **Fluid Start Time**
- Earliest of initial lactate if elevated/septic shock/initial hypotension is used to determine time.

- 3-hours of **Fluid Start Time** exclusion or expired: Crystalloid Fluid Administration within 3 hours of **Fluid Start Time** Exclusions

**Denominator:**
- Crystalloid Fluid Administration
- First exclude all 3-hour exclusions and then exclude cases that are in 3-hour exclusions of Crystalloid Fluid Administration.

- The minimum of ( Initial Lactate Level Collection Time, Septic Shock Presentation Time, Initial Hypotension Time ) IF
  - (Initial Lactate Level Collection = 1 -AND- Initial Lactate Level ≥ 4 mmol/L -AND- Elevated Lactate Reason = 2)
  - Septic Shock Present = 1
  - Initial Hypotension = 1
  - )

- **Fluid Start Time** Not Null -AND- Excluded Time Not Null -AND- time interval between Excluded Time and **Fluid Start Time** not greater than 3 hr (Excluded Time – **Fluid Start Time** ≤ 3 hr) -OR-

- **Fluid Start Time** Not Null -AND- Discharge Time Not Null -AND- Discharge Status = 20 -AND- time interval between Discharge Time and **Fluid Start Time** not greater than 3 hr (Discharge Time – **Fluid Start Time** ≤ 3 hr)

- All cases except cases dropped by **3-Hour Exclusions** and the exclusions of Crystalloid Fluid Administration -AND-
  - [(Initial Lactate Level Collection = 1 -AND- Initial Lactate Level ≥ 4 mmol/L -AND- Elevated Lactate Reason = 2) -OR- Septic Shock Present = 1 -OR- Initial Hypotension = 1] -AND- Adult Crystalloid
### 2018 Sepsis Measure Specifications: Adult Time Zero Severe/Shock

<table>
<thead>
<tr>
<th>After exclusions, select cases that are crystalloid fluid required as denominator.</th>
<th>Fluid Administration ≠ 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>o Elevated Lactate (≥4) or Septic shock or Initial Hypotension and not VAD</td>
<td>(Initial Lactate Level Collection = 1 -AND- Initial Lactate Level ≥ 4 mmol/L -AND- Elevated Lactate Reason = 2) -OR- Septic Shock Present = 1 -OR- Initial Hypotension = 1 -AND- (</td>
</tr>
<tr>
<td></td>
<td>Adult Crystalloid Fluid Administration = 1 -AND- Crystalloid Fluid Administration Time Not Null -AND- <strong>Fluid Start Time</strong> Not Null -AND- time interval between Crystalloid Fluid Administration Time and <strong>Fluid Start Time</strong> not more than 6 hr before and not greater than 3 hr (-6 hr ≤ Crystalloid Fluid Administration Time – <strong>Fluid Start Time</strong> ≤ 3 hr)</td>
</tr>
<tr>
<td></td>
<td>)</td>
</tr>
<tr>
<td>6-hours of shock exclusion or expired: Vasopressor Administration within 6 hours of septic shock Exclusions</td>
<td>Septic Shock Time Not Null -AND- Excluded Time Not Null -AND- time interval between Excluded Time and Septic Shock Time not greater than 6 hr (Excluded Time – Septic Shock Time ≤ 6 hr) -OR-</td>
</tr>
<tr>
<td></td>
<td>Septic Shock Time Not Null -AND- Discharge Time Not Null -AND- Discharge Status = 20 -AND- time interval between Discharge Time and Septic Shock Time not greater than 6 hr (Discharge Time – Septic Shock Time ≤ 6 hr)</td>
</tr>
</tbody>
</table>

Numerator:
- Crystalloid Fluid Administration within 3 hours of **Fluid Start Time**
- This captures all cases where fluid administration datetime is present AND the correct volume was administered. Fluids cannot be more than 6 hours prior to **Fluid Start Time**.
2018 Sepsis Measure Specifications: Adult Time Zero Severe/Shock

Denominator:
- Vasopressor Administration
- First exclude all 3-hour exclusions and then exclude cases that are in 6-hour exclusions of Vasopressor Administration.
- After exclusions, select cases that are vasopressor required as denominator.
  - Septic shock, correct fluids, and persistent hypotension

Numerator:
- Vasopressor Administration within 6 hours of septic shock
- Vasopressors cannot be more than 6 hours before Fluid Start Time.

- All cases except cases dropped by **3-Hour Exclusions** and the exclusions of Vasopressor Administration -AND-
  - Septic Shock Present = 1 -AND- Adult Crystalloid Fluid Administration = 1 -AND- Persistent Hypotension = 1 -AND- Crystalloid Fluid Administration Time Not Null -AND- **Fluid Start Time** Not Null -AND- time interval between Crystalloid Fluid Administration Time and **Fluid Start Time** not more than 6 hr before and not greater than 3 hr (-6 hr ≤ **Fluid Start Time** ≤ 3 hr)

  - **(Septic Shock Present = 1 -AND- Adult Crystalloid Fluid Administration = 1 -AND- Persistent Hypotension = 1 -AND- Crystalloid Fluid Administration Time Not Null -AND- **Fluid Start Time** Not Null -AND- time interval between Crystalloid Fluid Administration Time and **Fluid Start Time** not more than 6 hr before and not greater than 3 hr (-6 hr ≤ **Fluid Start Time** ≤ 3 hr))** -AND- Vasopressor Administration = 1
  - ) -AND-
  - Septic Shock Time Not Null -AND- Vasopressor Administration Time Not Null -AND- time interval between Vasopressor Administration Time and Septic Shock Time not greater than 6 hr (Vasopressor Administration Time – Septic Shock Time ≤ 6 hr) -AND-
  - **Fluid Start Time** Not Null -AND- Vasopressor Administration Time Not Null -AND- time interval between Vasopressor Administration Time and **Fluid Start Time** not more than 6 hr before (Vasopressor Administration Time – **Fluid Start Time** ≥ -6 hr)
### 2018 Sepsis Measure Specifications: Adult Time Zero Severe/Shock

**Denominator:**
- Septic shock and correct fluids
- First exclude all 3-hour exclusions and then exclude cases that are in 6-hour exclusions of Fluid Assessment.
- After exclusions, select cases that are fluid assessment required as denominator.
  - Septic shock and correct fluids

**Numerator:**
- Repeat Volume Status and Tissue Perfusion Assessment Performed after fluid administration and within 6 hours of septic shock

<table>
<thead>
<tr>
<th>Condition</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-hours of shock exclusion or expired: Fluid Assessment after fluid administration and within 6 hours of septic shock exclusions</td>
<td>Septic Shock Time Not Null -AND- Excluded Time Not Null -AND- time interval between Excluded Time and Septic Shock Time not greater than 6 hr (Excluded Time – Septic Shock Time ≤ 6 hr) -OR- Septic Shock Time Not Null -AND- Discharge Time Not Null -AND- Discharge Status = 20 -AND- time interval between Discharge Time and Septic Shock Time not greater than 6 hr (Discharge Time – Septic Shock Time ≤ 6 hr)</td>
</tr>
<tr>
<td>All cases except cases dropped by 3-Hour Exclusions and the exclusions of Fluid Assessment -AND-</td>
<td>All cases except cases dropped by 3-Hour Exclusions and the exclusions of Fluid Assessment -AND-</td>
</tr>
<tr>
<td>Septic Shock Present = 1 -AND- Adult Crystalloid Fluid Administration = 1 -AND- Crystalloid Fluid Administration Time Not Null -AND- Fluid Start Time Not Null -AND- time interval between Crystalloid Fluid Administration Time and Fluid Start Time not more than 6 hr before and not greater than 3 hr (-6 hr ≤ Crystalloid Fluid Administration Time – Fluid Start Time ≤ 3 hr)</td>
<td>Septic Shock Present = 1 -AND- Adult Crystalloid Fluid Administration = 1 -AND- Crystalloid Fluid Administration Time Not Null -AND- Fluid Start Time Not Null -AND- time interval between Crystalloid Fluid Administration Time and Fluid Start Time not more than 6 hr before and not greater than 3 hr (-6 hr ≤ Fluid Start Time ≤ 3 hr)</td>
</tr>
<tr>
<td>Specifications: Adult Time Zero Severe/Shock</td>
<td></td>
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<td>-----------------------------------------------</td>
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</tr>
<tr>
<td>greater than 3 hr ((-6 \text{ hr} \leq \text{Crystalloid Fluid Administration Time} - \text{Fluid Start Time} \leq 3 \text{ hr}))</td>
<td></td>
</tr>
<tr>
<td>• ) -AND-</td>
<td></td>
</tr>
<tr>
<td>• Septic Shock Time Not Null -AND- Repeat Volume Status and Tissue Perfusion Assessment Performed Time Not Null -AND- Repeat Volume Status and Tissue Perfusion Assessment Performed = 1 -AND- time interval between Repeat Volume Status and Tissue Perfusion Assessment Performed Time and Septic Shock Time not greater than 6 hr (Repeat Volume Status and Tissue Perfusion Assessment Performed Time = Septic Shock Time \leq 6 \text{ hr}) -AND-</td>
<td></td>
</tr>
<tr>
<td>• Crystalloid Fluid Administration Time Not Null -AND- Repeat Volume Status and Tissue Perfusion Assessment Performed Time Not Null -AND- Repeat Volume Status and Tissue Perfusion Assessment Performed = 1 -AND- time interval between Repeat Volume Status and Tissue Perfusion Assessment Performed Time and Crystalloid Fluid Administration Time not less than 0 (Repeat Volume Status and Tissue Perfusion Assessment Performed Time = Crystalloid Fluid Administration Time \geq 0)</td>
<td></td>
</tr>
</tbody>
</table>