NEW YORK STATE PARTNERSHIP FOR PATIENTS - SEPSIS CARE

Christa A. Schorr RN, MSN, FCCM
Associate Professor of Medicine
Nurse Scientist, Cooper Research Institute-Critical Care
Objectives

Background

Early identification

Next steps
Severe Sepsis

• Severe Sepsis is the Leading Cause of Hospital Death
• Admissions with severe sepsis 8X > chance of death than other conditions
• Most expensive condition treated in the hospital (23 billion dollars per annum)
• Enormous economic burden that can be lessened with early identification and early appropriate evidence based medicine care

NCHS data brief #62, 2011
US National Lib Med, NIH, 2010
HCUP Statistical Brief #160

<table>
<thead>
<tr>
<th>First-listed diagnosis</th>
<th>2000</th>
<th>2005</th>
<th>2010</th>
<th>Percent change¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate per 100 persons hospitalized for diagnosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2.5</td>
<td>2.2</td>
<td>2.0</td>
<td>-20</td>
</tr>
<tr>
<td>Respiratory failure</td>
<td>25.3</td>
<td>19.3</td>
<td>16.5</td>
<td>-35</td>
</tr>
<tr>
<td>Pneumonitis due to solids and liquids</td>
<td>17.4</td>
<td>15.2</td>
<td>13.6</td>
<td>-22</td>
</tr>
<tr>
<td>Septicemia</td>
<td>13.9</td>
<td>19.3</td>
<td>16.3</td>
<td>+17</td>
</tr>
<tr>
<td>Kidney disease</td>
<td>9.9</td>
<td>6.5</td>
<td>3.5</td>
<td>-65</td>
</tr>
<tr>
<td>Cancer</td>
<td>8.1</td>
<td>6.8</td>
<td>4.4</td>
<td>-46</td>
</tr>
<tr>
<td>Stroke</td>
<td>6.4</td>
<td>6.5</td>
<td>4.7</td>
<td>-27</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>4.9</td>
<td>3.3</td>
<td>3.3</td>
<td>-33</td>
</tr>
<tr>
<td>Heart disease</td>
<td>3.7</td>
<td>2.8</td>
<td>3.1</td>
<td>-16</td>
</tr>
</tbody>
</table>

¹Percent change is calculated as (Rate 2000 - Rate 2010) / Rate 2000 * 100.

The Surviving Sepsis Campaign: Results of an international guideline-based performance improvement program targeting severe sepsis

Mitchell M. Levy, MD; R. Phillip Dellinger, MD; Sean R. Townsend, MD; Walter T. Linde-Zwirble; John C. Marshall, MD; Julian Bion, MD; Christa Schorr, RN, MSN; Antonio Artigas, MD; Graham Ramsay, MD;

Conclusions: The Campaign was associated with sustained, continuous quality improvement in sepsis care. Although not necessarily cause and effect, a reduction in reported hospital mortality rates was associated with participation. The implications of this study may serve as an impetus for similar improvement efforts. (Crit Care Med 2010; 38:367–374)
Sepsis Bundle Compliance Is Associated with Improved Survival

- Surviving Sepsis Campaign Database
- 218 Community, academic and tertiary care hospitals in the U.S., Europe, and South America
- 29,470 patients over 7.5 years
- Median resuscitation bundle compliance was 15%
- Mortality was lower with high compliance (>15%) of resuscitation bundle (29.0% vs. 38.6%)
- For every 10% increase in compliance, the ICU and hospital LOS was reduced by 4%

Early Patient Identification

Emergency Department  Critical Care Units  Medical surgical units
Mortality Based on Origin at Time of Presentation

<table>
<thead>
<tr>
<th>Patient characteristics</th>
<th>Subjects (%)</th>
<th>Hospital mortality (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Source</td>
<td>100</td>
<td>34.8</td>
</tr>
<tr>
<td>ED</td>
<td>52.4</td>
<td>27.6</td>
</tr>
<tr>
<td>ICU</td>
<td>12.8</td>
<td>41.3</td>
</tr>
<tr>
<td>Ward</td>
<td>34.8</td>
<td>46.8</td>
</tr>
</tbody>
</table>

Multidisciplinary Cross-departmental Alignment
Where Do The Gains Live?

Lead Time to Diagnosis

Delivery of Proper Treatment

Lead time to Diagnosis & Treatment
Rationale
The evidence cited for all components of this measure is directly related to:

- Organ Failure
- LOS (Length of Stay)
- Cost
- Mortality
Importance of Sepsis Screening

- Early Recognition
- Early Intervention

Prevent
- Prevent progression to worsening organ dysfunction

Evaluate
- Evaluation of condition
- Plan for disposition

Early
Evaluation for Severe Sepsis Screening Tool

Instructions: Use this optional tool to screen patients for severe sepsis in the emergency department, on the medical/surgical floors, or in the ICU.

1. Is the patient’s history suggestive of a new infection?
   - Pneumonia, empyema
   - Urinary tract infection
   - Acute abdominal infection
   - Meningitis
   - Skin/soft tissue infection
   - Bone/joint infection
   - Wound infection
   - Blood stream catheter infection
   - Endocarditis
   - Implantable device infection
   - Other infection

   ___ Yes ___ No

2. Are any two of the following signs & symptoms of infection both present and new to the patient? Note: laboratory values may have been obtained for inpatients but may not be available for outpatients.
   - Hyperthermia > 38.3 °C (101.3 °F)
   - Hypothermia < 36 °C (96.8°F)
   - Hypoglycemia (plasma glucose < 40 mg/dL)
   - Tachypnea > 20 bpm
   - Leukocytosis (WBC count > 12,000 µL⁻¹)
   - Leukopenia (WBC count < 4000 µL⁻¹)
   - Hyperglycemia (plasma glucose > 140 mg/dL or 7.7 mmol/L in the absence of diabetes)
   - Altered mental status
   - Tachycardia > 90 bpm

   ___ Yes ___ No

   If the answer is yes to both questions 1 and 2, suspicion of infection is present:
   ✅ Obtain: lactic acid, blood cultures, CBC with differential, basic chemistry labs, bilirubin.
   ✅ At the physician’s discretion obtain: UA, chest x-ray, amylase, lipase, ABG, CRP, CT scan.

3. Are any of the following organ dysfunction criteria present at a site remote from the site of the infection that are NOT considered to be chronic conditions? Note: in the case of bilateral pulmonary infiltrates the remote site stipulation is waived.
   - SBP < 90 mmHg or MAP < 65 mm-Hg
   - SBP decrease > 40 mm-Hg from baseline
   - Creatinine > 2.0 mg/dL (176.8 mmol/L) or urine output < 0.5 ml/kg/hour for 2 hours
   - Bilirubin > 2 mg/dL (34.2 mmol/L)
   - Platelet count < 100,000 µL
   - Lactate > 2 mmol/L (18.0 mg/dL)
   - Coagulopathy (INR > 1.5 or aPTT > 60 secs)
   - Acute lung injury with PsO2/FiO2 < 250 in the absence of pneumonia as infection source
   - Acute lung injury with PsO2/FiO2 < 250 in the presence of pneumonia as infection source

   ___ Yes ___ No

   If suspicion of infection is present AND organ dysfunction is present, the patient meets the criteria for SEVERE SEPSIS and should be entered into the severe sepsis protocol.

   Date: ____/____/______ (circle: dd/mm/yy or mm/dd/yy)  Time: ____: ____ (24 hr. clock)

Version 7.2.13
Electronic surveillance, prompts and nurse assessment

Sepsis Advisory

PATIENT MAY BE SEPTIC

Please indicate below whether or not the patient's history is suggestive of a new or suspected infection.

If you suspect the patient has any of the infections listed below, choose that infection by clicking the button and click Accept. If you do not suspect that the patient has an infection, click "No New or Suspected Infection" and click Accept.
Triage Sepsis Alert and Sepsis Protocol in the ED

Sepsis screen criteria:
1) SBP less than 90 mmHg?
2) HR Greater than 90 beats/minute?
3) RR Greater than 20 per minute?
4) Temp Greater than 38C or Less than 36C?
5) Suspected or Known infection?

SWAT A "pop-up" if:
— SBP less than 90 mmHg + any other criteria

SWAT B "pop-up" if:
— Suspected or known infection + any 2 SIRS (#2-4)

Early Recognition & Treatment of Sepsis

Reduction in ICU LOS
- 5.85 ± 4.38 days vs 4.21 ± 3.64 days;
- P = 0.003

Reduction in cost per case
- $14,378 vs $12,311;
- P = 0.033

Judd WR et al, Pharmacother, 2014 Jun 30
Protocol-Based Resuscitation Bundle to Improve Outcomes in Septic Shock Patients: Evaluation of the Michigan Health and Hospital Association Keystone Sepsis Collaborative*

Pre-post implementation comparisons of risk-adjusted hospital length of stay (in days), stratified by hospital collaborative participation, as well as by adherence level in collaborative hospitals.

High bundle adherence = decrease length of stay
Post-Acute Care Toolkit

TABLE OF CONTENTS

I. Overview

II. Instructions

III. Training Materials
   a. Sepsis Educational Slides

IV. Sepsis Clinical Tools
   a. Severe Sepsis Early Identification and Treatment Pathway
   b. Severe Sepsis SBAR Communication Tool

V. Training Assessment
   a. Sepsis Education Pre-Test
   b. Sepsis Education Post-Test
   c. Sepsis Training Evaluation Form

VI. Resource Page