THE FUTURE OF SEPSIS CARE IS NOW

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Disclosures

- No Financial Disclosures
- Leadership role in the Surviving Sepsis Campaign Performance Improvement Program
Objectives

Reflection

Present

Path Ahead
Why the future is now?
Guidelines to bundles - 2004

Special Articles

Surviving Sepsis Campaign guidelines for management of severe sepsis and septic shock

F. Phillip Dellinger, MD; Jason V. Carlet, MD; Henry Lucey, MD; Harvey Gerlach, MD, FRCPC; Thierry Carlet, MD, Jennifer Cohen, MD; Janine G. Marche, MD, PhD; Dietz Kehl, MD; John C. Marshall, MD; Margaret W. Parker, MD; Graham Povoa, MD; Jordan L. Zimmerman, MD; Juan-Louis Vincent, MD, PhD; Mitchell M. Levy, MD, for the Surviving Sepsis Campaign Guidelines Committee

Sponsored by: American Association of Critical-Care Nurses, American College of Critical Care Medicine, American College of Emergency Physicians, American Thoracic Society, Australasian and New Zealand Intensive Care Societies, European Society of Critical Care Medicine and Intensive Therapy, European Society of Intensive Care Medicine, European Federation of Intensive Care Medicine, International Sepsis Forum, Society of Critical Care Medicine, Society for Intensive Care Medicine

Objective: In 2003, critical care and infectious disease experts recognized the need for improved, evidence-based guidelines for the management of severe sepsis and septic shock. The guidelines, developed by the Surviving Sepsis Campaign, represent an international effort to improve care and improve survival in sepsis patients.

Introduction: The Surviving Sepsis Campaign (SSC) guidelines are a set of recommendations that aim to improve the care of critically ill patients with severe sepsis and septic shock. These guidelines are based on evidence from randomized controlled trials and observational studies. Over the past 20 years, significant advances have been made in the understanding of sepsis and its management. These advances have led to new treatment options and improved outcomes for patients with severe sepsis and septic shock.

Severe Sepsis Bundles:

Severe Sepsis Resuscitation Bundle

1. Severe lactate measured
2. Blood cultures obtained prior to antibiotic administration
3. From the time of presentation, broad-spectrum antibiotics administered within 3 hours for ESF+I and 1 hour for non-ESF ICU patients
4. In the event of hypotension and/or lactate > 4 mmol/L (35 mg/dL)
   a. Administer an initial bolus of volume (e.g., crystalloid or colloid equivalent)
   b. Apply vasopressors for hypertension not responding to initial fluid resuscitation to maintain mean arterial pressure (MAP) ≥ 65 mmHg
5. In the event of persisting hypotension despite fluid resuscitation (septic shock) and/or lactate > 4 mmol/L (35 mg/dL)
   a. Achieve central venous pressure (CVP) of 8–12 mmHg
   b. Achieve central venous oxygen saturation (ScvO2) of ≥ 70%

Severe Sepsis Management Bundle

1. Low-dose norepinephrine administered for specific shock in accordance with a standardized ICU policy
2. Drotrecogin alfa (activated) administered in accordance with a standardized ICU policy
3. Glucose control maintained lower limit of normal, but < 150 mg/dL (8.3 mmol/L)
4. Inspiratory plateau pressures maintained < 30 cm H2O for mechanically ventilated patients

*See the individual chart measurement tool for an explanation of the chart.

**Modulating a mixed venous oxygen saturation (ScvO2) of 80% is an acceptable alternative.

© 2004 Surviving Sepsis Campaign and the Institute for Healthcare Improvement
SSC Database and Implementation Guide
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)
<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>


R. Phillip Dellinger, MD1; Mitchell M. Levy, MD2; Andrew Rhodes, MB BS3; Djillali Annane, MD4; Herwig Gerlach, MD, PhD5; Steven M. Opal, MD6; Jonathan E. Sevransky, MD7; Charles L. Sprung, MD8; Ivor S. Douglas, MD9; Roman Jaeschke, MD10; Tiffany M. Osborn, MD, MPH11; Mark E. Nunnally, MD12; Sean R. Townsend, MD13; Konrad Reinhart, MD14; Ruth M. Kleinpell, PhD, RN-CS15; Derek C. Angus, MD, MPH16; Clifford S. Deutschman, MD, MS17; Flavia R. Machado, MD, PhD18; Gordon D. Rubenfeld, MD19; Steven A. Webb, MB BS, PhD20; Richard J. Beale, MB BS21; Jean-Louis Vincent, MD, PhD22; Rui Moreno, MD, PhD23; and the Surviving Sepsis Campaign Guidelines Committee including the Pediatric Subgroup*
New Database - 3 & 6 hour bundle
Dissemination and Application
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%

Sepsis Mortality Trends in Clinical Trials

# Inpatient hospital death rates, by first-listed diagnosis: United States, 2000, 2005, and 2010

<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>

Early Patient Identification

- Emergency Department
- Critical Care Units
- Medical surgical units
WHAT WAS HAPPENING IN YOUR FACILITY BETWEEN 2004-2014?
Definitions

Guidelines

Bundles

?
OLD WAY

NEW WAY
Sepsis Definitions, CMS and Antibiotics

Extensive real-world field testing must be completed to assess reliability, usability, and feasibility of measures and definitions. There is risk that changing these effective definitions and identification criteria could impede ongoing quality improvement efforts.

The existing sepsis definitions, including the use of SIRS criteria, have been instrumental in training clinicians and nurses on how best to identify the earliest stages of sepsis. CMS will track the research and field testing that the proposed definitions will inspire.
“I should”, “I should”, “I should” quickly turned to NOW, You Must!
Rationale
The evidence cited for all components of this measure is directly related to:

- Organ Failure
- LOS (Length of Stay)
- Cost
- Mortality
Two Successes

For the Government
Indicator Performance

For the Patient
Indicator Performance and Optimal Patient Treatment
Consensus Definitions for Sepsis and Septic Shock

A critical care task force has proposed a new definition for sepsis and septic shock based on advances in science and the testing of clinical criteria against patient outcomes in EHR data.

The Task Force now recommends that sepsis and septic shock be defined as follows:

Definitions:

Sepsis: Life-threatening organ dysfunction caused by a dysregulated host response to infection

http://sites.jamanetwork.com/sepsis/
The Case for Delaying Proposed Changes to Definitions for Sepsis and Septic Shock: A Letter to the Editor of the Journal of the American Medical Association

The Centers for Medicare & Medicaid Services (CMS) presented this letter to the editor of the Journal of the American Medical Association (JAMA) in the JAMA publication of July 26, 2016; volume 316, number 4, regarding sepsis definitions as proposed by the Sepsis Definitions Task Force.

Background Information:
The sepsis-3 definitions1, outlined in the JAMA article, were developed by the Sepsis Definitions Task Force, a group of 19 critical care physicians from North America and Europe. The task force proposed that the severe sepsis definition not rely on the use of systematic inflammation response syndrome (SIRS), a combination of two or more physiological responses to conditions such as infection, inflammation, and trauma. Instead, the task force advocated for the adoption of the sequential (sepsis-related) organ failure assessment (SOFA) score, among other definitions and associated guidelines. The SOFA aims to identify abnormalities in various organ systems by assigning a score after taking into account multiple variables such as creatinine level, bilirubin level, and partial pressure of oxygen level, as well as points on the Glasgow Coma Scale. The task force also proposed that septic shock be defined as the combination of hypotension and elevated lactate levels, instead of hypotension or elevated lactate levels.

In the letter below, CMS expresses concern about the proposed updates to the current definitions for sepsis and septic shock, as these definitions are the basis for the CMS: Early Management Bundle, Severe Sepsis/Septic Shock (SEP-1) measure. The authors of the letter acknowledge the efforts of the task force and the new research stemming from the international consensus efforts, but they stress the need to thoroughly vet the new definitions through additional research and field testing. The authors also call attention to a potential limitation of the new definitions in their ability to identify cases that present in the inpatient and outpatient setting early enough to mitigate the effects of sepsis; not being able to pinpoint these cases quickly enough could worsen trends in overall morbidity and mortality.

Letter to the Editor:
How The Proposed Sepsis Definitions Affect CMS & SEP-1?

• Extensive real-world field testing must be completed to assess reliability, usability, and feasibility of measures and definitions.

• There is risk that changing these effective definitions and identification criteria could impede ongoing quality improvement efforts.

• The existing sepsis definitions, including the use of SIRS criteria, have been instrumental in training clinicians and nurses on how best to identify the earliest stages of sepsis.

• CMS will track the research and field testing that the proposed definitions will inspire.

https://www.qualitynet.org/dcs/Sepsis Definitions - CMS Letter to the Editor of JAMA, PDF
Regulations are Not Enough
Importance of Sepsis Screening

- Early Recognition
- Early Intervention

 Prevent
- Prevent progression to worsening organ dysfunction

Evaluate
- Evaluation of condition
- Plan for disposition
Value of Nurses at the Bedside

• Empower nurses to recognize and report sepsis.
• Communicate with the team
• Initiate protocol
Empower Nurses

Nurse receives the Sepsis/Severe Sepsis Best Practice Advisory

Has a lactic acid been performed in the last 4 hours?

Order and draw a STAT lactic acid

Is the lactic acid greater than 2 mmol/L?

Order and re-draw the lactic acid within 4 hours of the initial Lactic Acid order time.

Notify the provider within 1 hour of receiving the result if the lactate is greater than 2 mmol/L.

Has the patient had blood cultures performed in the last 24 hours?

Order and draw STAT blood culture (x2) panel

Notify the provider within 1 hour of receiving the result if the results are abnormal.

No

Yes
Nurses Making a Difference

UW Medical Center is 1st to earn 6 Magnet nursing designations

'Ultimate seal of quality and confidence' recognizes nurses' role in hospital decision-making, adherence to practice standards

By Brian Donohue | HSNewsBeat | Updated 12:45 PM, 11.18.2016

UW Medical Center nurses prepare a patient for a colonoscopy in the Digestive Disease Center.

UW Medicine today announced that one of its Seattle hospitals, UW Medical Center, is the first facility in the world to earn a sixth Magnet designation from the American Nurses
The Future
NEXT EXIT
Future of Sepsis Care

Readmissions

Public Awareness

Education
The RN Sepsis Coordinator collaborates with the multidisciplinary team to provide care for septic patients. This individual will also provide clinical and professional expertise to focus on health promotion and disease prevention.

Role Accountabilities include:
Facilitates the development, implementation and ongoing adherence of sepsis program protocols and therapies. Ensures the protocols and therapies become the standard of care followed within the facility. Collaborates with medical and hospital staff to provide multidisciplinary care to septic patients. Provides education and clinical expertise to care team, patients, and families. Identifies and integrates patient learning needs, abilities and readiness into the Plan of Care. Works in collaboration with the nursing team to develop and implement individualized teaching plans for patients and families. Collects and analyzes sepsis program patient data to assist with documentation, coding, clinical care, and improved outcomes.
NJ Hospitals Join Forces to Reduce Deaths Caused by Sepsis

Lilo H. Stainton | September 13, 2016

The occurrence and often fatal effects of sepsis have been greatly reduced here because hospitals are cooperating to diagnose and treat the infection.

New Jersey saved nearly 400 patients from dying of sepsis, an elusive but deadly infection, last year. The reason: a collaboration among dozens of hospitals and other healthcare organizations and their efforts to share diagnosis data, treatment protocols, and lessons learned.

Working together under the leadership of the New Jersey Hospital Association, the group was able to dramatically reduce the occurrence of sepsis, a systemic infection that can trigger inflammation and major organ failure. This effort also drove down the state’s sepsis mortality rate by nearly 11 percent, setting the coalition well on its way to reaching its final goal of a 20 percent reduction in patient deaths.

The findings — which the hospital association will post online early Tuesday, to coincide with World Sepsis Day — are good news for hospital patients, elderly people, or those with weakened immune systems who are more likely to contract the infection. The results also demonstrate the importance of cooperation among healthcare facilities that are traditionally competitors, observers said.

400 lives saved

Sharing data and tools

NJHA Cooperation Hospitals

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

CDC Education for the Clinician

Making Health Care Safer
Think sepsis. Time matters.

Sepsis is a complication caused by the body’s overwhelming and life-threatening response to infection. It can lead to tissue damage, organ failure, and death. Sepsis is difficult to diagnose. It happens quickly and can be confused with other conditions early on. Sepsis is a medical emergency.

Time matters. When sepsis is quickly recognized and treated, lives are saved. Healthcare providers are the critical link to preventing, recognizing, and treating sepsis.

Healthcare providers can:
- Prevent infections. Follow infection control requirements (e.g., hand hygiene) and ensure patients receive recommended vaccines (e.g., flu and pneumococcal).
- Educate patients and their families. Stress the need to prevent infections, manage chronic conditions, and seek care if signs of severe infection or sepsis are present.
- Think sepsis. Know sepsis signs and symptoms to identify and treat patients early.
- Act fast. If sepsis is suspected, order tests to determine if infection is present, where it is, and what caused it. Start antibiotics and other medical care immediately. Document antibiotic dose, duration, and response.
- Reassure patient management. Check patient progress frequently. Reassure antibiotic therapy 24-48 hours or sooner to change therapy as needed. Be sure the antibiotic type, dose, and duration are correct.

Want to learn more? www.cdc.gov/vitalsigns/sepsis

80%
Sepsis begins outside of the hospital for nearly 80% of patients.

7 in 10
A CDC evaluation found 7 in 10 patients with sepsis had recently used health care services or had chronic diseases requiring frequent medical care.

4
Four types of infections are most often associated with sepsis: lung, urinary tract, skin, and bone.

https://www.youtube.com/watch?v=s687VMj6iwo
Where you work
- Education
- Reminder
Public Awareness of Sepsis

- Respondents who have heard the word sepsis
- Respondents who have no idea what sepsis is
  (Have never heard the word or can offer no possible definition)


Harris Interactive Poll, commissioned by Sepsis Alliance

2003: 19%
2010: 33%
2011: 41%
2009: 56%
2011: 69%
Where you wait
Patient
Visitor
Staff

ACCESS TO HOSPITAL AT LEVEL 1

00:30

Recognize the Signs
- High fever
- Chills or severe shaking
- Fast heart or breathing rate
- Confusion
- Feeling worse than normal

Respond
- Get to the hospital
- Start treatment

Recover
- Request information on sepsis treatment and the recovery process
- Support may include oxygen, antibiotics, intravenous fluids and physical therapy

Everyone should learn the signs of sepsis and know how to get help quickly. Health care providers should treat sepsis like a serious medical emergency.
Patient Empowerment Needs

- Improve understanding of sepsis.
- Reduce complications & hospital admissions
- Better health experience
- Benefit to patient, providers and tax payers
Patient Education Resources

http://www.cdc.gov/sepsis/basic/index.html
Patient Experience and Readmissions

- Higher star ratings were associated with lower 30-day readmissions.
- Strongest signal can depend on the effectiveness of communication regarding discharge instructions.

Pre-Hospital – Cross-departmental alignment – Transitions of Care
Sepsis Readmission Characteristics

- Most common infections were urinary tract and respiratory
- Most common organ dysfunction respiratory, cardiovascular and renal
- 1/20 severe sepsis patients experience an unplanned readmission within 7 days (median 6.6%)
- Severe sepsis patients readmitted within 30 days (median 19.3%)

Important For Patient & Family

- Sepsis survivors frequently have long-term sequelae that requires management of potential complications.
- Readmissions after sepsis more likely to result in death or hospice care.
- Coordinated care between the hospital, patient and providers has been successful in other diseases.

Donnelly et al. 2015 *Critical Care Medicine*, 43(9), 1916-1927.
### The 20 most expensive conditions treated in U.S. hospitals, all payers, 2013

<table>
<thead>
<tr>
<th>Rank</th>
<th>CCS principal diagnosis category</th>
<th>Aggregate hospital costs, $ millions</th>
<th>National costs, %</th>
<th>Number of hospital stays, thousands</th>
<th>Hospital stays, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Septicemia</td>
<td>23,663</td>
<td>6.2</td>
<td>1,297</td>
<td>3.6</td>
</tr>
<tr>
<td>2</td>
<td>Osteoarthritis</td>
<td>16,520</td>
<td>4.3</td>
<td>1,023</td>
<td>2.9</td>
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<tr>
<td>3</td>
<td>Liveborn</td>
<td>13,287</td>
<td>3.5</td>
<td>3,765</td>
<td>10.6</td>
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<tr>
<td>4</td>
<td>Complication of device, implant or graft</td>
<td>12,431</td>
<td>3.3</td>
<td>632</td>
<td>1.8</td>
</tr>
<tr>
<td>5</td>
<td>Acute myocardial infarction</td>
<td>12,092</td>
<td>3.2</td>
<td>602</td>
<td>1.7</td>
</tr>
<tr>
<td>6</td>
<td>Congestive heart failure</td>
<td>10,218</td>
<td>2.7</td>
<td>882</td>
<td>2.5</td>
</tr>
<tr>
<td>7</td>
<td>Spondylosis, intervertebral disc disorders, other back problems</td>
<td>10,198</td>
<td>2.7</td>
<td>555</td>
<td>1.6</td>
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<tr>
<td>8</td>
<td>Pneumonia</td>
<td>9,501</td>
<td>2.5</td>
<td>961</td>
<td>2.7</td>
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<tr>
<td>9</td>
<td>Coronary atherosclerosis</td>
<td>9,003</td>
<td>2.4</td>
<td>458</td>
<td>1.3</td>
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<tr>
<td>10</td>
<td>Acute cerebrovascular disease</td>
<td>8,840</td>
<td>2.3</td>
<td>585</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Table. Length of Stay and Cost for Unplanned 30-Day Readmissions After an Index Admission for Sepsis, Acute Myocardial Infarction, Heart Failure, Pneumonia, and Chronic Obstructive Pulmonary Disease

<table>
<thead>
<tr>
<th>Admissions associated with 30 d readmission</th>
<th>National Readmission Data&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Weighted Proportion of Cases in the United States</th>
<th>Percentage of Index Admissions Readmitted Within 30 Days (95% CI)</th>
<th>Percentage of Total Estimated Cost of All Readmissions (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of All Index Admissions Readmitted Within 30 Days</td>
<td>Estimated Mean Length of Stay (95% CI), d&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Estimated Mean Cost per Readmission (95% CI), $&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Percentage of Index Admissions Readmitted Within 30 Days (95% CI)</td>
<td>Percentage of Total Estimated Cost of All Readmissions (95% CI)</td>
</tr>
<tr>
<td>Admissions associated with 30 d readmission</td>
<td>1,187,697</td>
<td>6.4 (6.4-6.5)</td>
<td>8,242 (8,225-8,258)</td>
<td>NA</td>
</tr>
<tr>
<td>Primary Analyses&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Sepsis</td>
<td>147,084</td>
<td>7.4 (7.3-7.4)</td>
<td>10,070 (10,021-10,119)</td>
<td>12.2 (11.9-12.4)</td>
</tr>
<tr>
<td>Acute myocardial infarction</td>
<td>15,001</td>
<td>5.7 (5.6-5.8)</td>
<td>9,424 (9,279-9,571)</td>
<td>1.2 (1.2-1.3)</td>
</tr>
<tr>
<td>Heart failure</td>
<td>79,480</td>
<td>6.4 (6.4-6.5)</td>
<td>9,051 (8,990-9,113)</td>
<td>6.7 (6.5-6.8)</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>59,378</td>
<td>6.7 (6.6-6.7)</td>
<td>9,533 (9,466-9,600)</td>
<td>5.2 (5.0-5.3)</td>
</tr>
<tr>
<td>Chronic obstructive pulmonary disease</td>
<td>54,396</td>
<td>6.0 (5.9-6.0)</td>
<td>8,417 (8,355-8,480)</td>
<td>4.6 (4.5-4.8)</td>
</tr>
<tr>
<td>Sensitivity Analyses&lt;sup&gt;d&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sepsis</td>
<td>89,800</td>
<td>7.6 (7.6-7.7)</td>
<td>10,828 (10,760-10,897)</td>
<td>7.3 (7.1-7.5)</td>
</tr>
<tr>
<td>Acute myocardial infarction</td>
<td>21,281</td>
<td>6.0 (5.9-6.1)</td>
<td>9,530 (9,408-9,654)</td>
<td>1.8 (1.7-1.8)</td>
</tr>
<tr>
<td>Heart failure</td>
<td>236,636</td>
<td>6.5 (6.5-6.5)</td>
<td>9,248 (9,211-9,285)</td>
<td>20.0 (19.6-20.4)</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>130,904</td>
<td>6.9 (6.9-7.0)</td>
<td>9,749 (9,700-9,797)</td>
<td>11.1 (10.9-11.4)</td>
</tr>
<tr>
<td>Chronic obstructive pulmonary disease</td>
<td>201,867</td>
<td>6.3 (6.3-6.4)</td>
<td>8,677 (8,641-8,713)</td>
<td>17.4 (17.1-17.7)</td>
</tr>
</tbody>
</table>

Factors Associated with Readmission

<table>
<thead>
<tr>
<th>Variables</th>
<th>Cohort n=444</th>
<th>No Readmission n=340</th>
<th>Readmission n=104</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sepsis- POA-present on admission</td>
<td>320 (72.1)</td>
<td>249 (73.2)</td>
<td>71 (68.3)</td>
<td>0.04</td>
</tr>
<tr>
<td>Any transfusion</td>
<td>211 (47.5)</td>
<td>150 (44.1)</td>
<td>61 (58.6)</td>
<td>0.009</td>
</tr>
<tr>
<td>Total parenteral nutrition use</td>
<td>48 (10.8)</td>
<td>26 (7.6)</td>
<td>22 (21.2)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Duration of antibiotics</td>
<td>9 (5–15)</td>
<td>8 (5–14)</td>
<td>12 (6–18)</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

Patient characteristics: Average age 59 years old, 50% women, 64% admitted through emergency department, and 50% were admitted to the hospital in the past year. Pneumonia was the most common infection source.

Lessons Learned and Next Steps

• Medication counseling
• Enhanced discharge planning and follow-up
• Coaching patients and caregivers
• Partnering hospitals with community physicians and skilled care facilities
• Nurses educate patient and providers prior to discharge

(American Hospital Association, 2015)
Partnering with Post-Acute Care Facilities

### Quality Measures

<table>
<thead>
<tr>
<th>Quality Measure</th>
<th>National Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of short-stay residents who were <strong>re-hospitalized</strong> after a nursing home admission.</td>
<td>22.60%</td>
</tr>
<tr>
<td>Percentage of short-stay residents who have had an <strong>outpatient emergency department</strong> visit.</td>
<td>12.10%</td>
</tr>
<tr>
<td>Percentage of long-stay residents with a <strong>urinary tract infection</strong>.</td>
<td>4.40%</td>
</tr>
</tbody>
</table>

Feedback Related To Readmission

- Reason for transfer to acute care hospital?
- What was the admitting diagnosis?
- What was the final discharge diagnosis?
- What could have been done to avoid a readmission?
Post-Acute Care Toolkit

[Image of the Post-Acute Care Toolkit cover]

Why the future is now?
Summary

Reflection

Present

Path Ahead
Thank You For Your Time