Early Detection of Sepsis in Long-Term Care Residents

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Objectives

• Relate the importance of early recognition of sepsis and implementation of evidence-based therapies to optimize patient safety

• Name two sepsis screening tools appropriate for use in the long-term care setting

• Utilize simulation to communicate effectively among healthcare team members leading to reduced errors in patient care

• Use the electronic medical health record to identify sepsis early
Sepsis Historical Facts

• One of the oldest syndromes known in medicine
• First introduced by Hippocrates
  – (ca. 460-370 BC)
• Derived from the Greek word *sipsi*
  – “to make rotten”
Sepsis Today

- Remains an ongoing and significant challenge
- Serious concern to healthcare providers, policymakers, patients
  - large number of cases
  - high mortality rates
  - associated costs

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Analyzing, Educating and Collaborating for Patient Safety
“Sepsis is a 'ninja' disease — it quietly sneaks up on unsuspecting victims and rapidly causes overwhelming illness and death. It's one of the biggest draws on national healthcare resources.”

- Henry E. Wang, MD, MS, University of Alabama at Birmingham
National Statistics

• Impacts between 900,000 and 3 million people in the U.S. each year
• Leading cause of death in the U.S.
  – mortality rate of 15% to 30%
• Adults age 65 years or older are five-fold more likely to have sepsis than younger adults
  – 6.5% vs. 1.3%

Gaieski, et al.
Ginde, et al.
National Statistics

• Nursing home residents are seven-fold more likely to have sepsis, compared with sepsis rates in adults not residing in a nursing home
  – 14% vs. 1.9%

• Cost of care related to sepsis for older U.S. adults has been documented to be $13.8 billion annually

Ginde, et al.
Angus, et al.
Pennsylvania’s Long-Term Care (LTC) Statistics

• PA Patient Safety Authority Infection Prevention Analysts
  – reviewed LTC events reported through PA’s Patient Safety Reporting System (PA-PSRS)
  – used the date reported from April 1, 2014, through March 31, 2016.

• Over the defined two-year period:
  – 486 potential occurrences of sepsis
  – 17 potential sepsis-related fatalities

• Patient safety concern for PA’s 702 long-term care facilities (LTCFs)
2016 Definitions

• New definitions for sepsis and septic shock
  – first revisions since 2001
  – reflect considerable advances made in the pathophysiology, management, and epidemiology of sepsis
  – offer more specificity in describing the life-threatening conditions and are aimed at achieving greater clarity and consistency in how sepsis is diagnosed, reported, and treated

• Sepsis
  – “life-threatening organ dysfunction caused by a dysregulated host response to infection”

• Septic shock
  – “manifested by profound circulatory, cellular, and metabolic abnormalities associated with a greater risk of mortality than sepsis alone”

Singer, et al.
The Infection

• Sepsis
  – often originates with an infection in the lungs, urinary tract, abdomen, or a surgical site
• Respiratory tract infections
  – most common site of infection causing sepsis
  – associated with the highest mortality
• Respiratory tract infections and urinary tract infections
  – top two types of infection causing sepsis in LTC
• Common pathogens
  – *Staphylococcus aureus*
  – *E. coli*
  – Types of *Streptococcus*

Agency for Healthcare Research and Quality
Mayr, et al.
Mylotte, et al.
CDC
Effects on Sepsis Survivors

• Sepsis worsens health status and increases disability among its survivors.

• Long-term effects include:
  – sepsis-induced inflammation
  – immunosuppression
  – functional disability
  – cognitive impairment

Yende, et al.
Jones, et al.
The Surviving Sepsis Campaign (SSC)

- Joint effort between the Society of Critical Care Medicine and the European Society of Intensive Care Medicine
- Goal:
  - reduce mortality from sepsis and septic shock globally
SSC’s Guidelines

• 2012 International Guidelines for Management of Severe Sepsis and Septic Shock:
  – “early recognition of sepsis and implementation of evidence-based therapies improves outcomes and decreases mortality”
  – “routine screening of potentially infected, seriously ill patients for sepsis, to improve the early identification of sepsis and allow implementation of sepsis therapy, is listed as a grade 1C recommendation”

* “a strong recommendation with low quality evidence”

Dellinger, et al.

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Developed and validated sepsis screening tools generally evaluate three areas:

• Known or suspected infection

• Systemic manifestations:
  – Hyperthermia or hypothermia
  – Tachycardia
  – Tachypnea
  – Acute mental status change
  – Leukocytosis or leukopenia
  – Hyperglycemia

• New or worsened organ dysfunction:
  – Hypotension
  – Increasing oxygen requirements
  – Elevated lactate, creatinine, bilirubin level
  – Thrombocytopenia
  – Coagulopathy

Dellinger, et al.
Signs of Sepsis in Older Adults

• The signs of both infection and organ dysfunction may be subtle and difficult to recognize in older adults with multiple comorbidities.
Signs of Sepsis in Older Adults

- Fever
  - may be absent
- Tachycardia and hypoxemia
  - lower incidence
- Confusion, delirium, weakness, falls, anorexia, incontinence
  - can be non-specific
LTC Early Detection Screening Tools

• Validated sepsis screening tool
  – should be adopted and used routinely on all residents

• Certified nursing assistant (CNA)
  – could perform the initial screening at the bedside

• Positive screening results
  – reported to and verified immediately by the licensed nurse

Severe Sepsis and Septic Shock Change Package
High, et al.

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LTC Early Detection Screening Tools

• Licensed nurse
  – evaluate and document any acute changes
  – communicate the resident’s status to the nurse practitioner, physician assistant, physician

• Clinician
  – evaluate the resident
  – review the resident’s advance directive
  – may direct medical management and/or transfer to a higher level of care within the facility or the hospital

High, et al.
Interventions to Reduce Acute Care Transfers (INTERACT)

• INTERACT
  – provides educational and clinical tools to detect early acute changes in LTC residents

• STOP and WATCH
  – vertical acronym that lists conditions that identify a potential change in a resident’s condition

• “Stop and Watch Early Warning Tool”
  – can be used by CNAs, therapists, dietary, environmental service workers, family members to alert the licensed nurse that a resident has a potential change in condition that needs further clinical evaluation

Ouslander & Shutes

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INTERACT

• Situation, Background, Appearance, and Review and Notify (SBAR)
  – assessment and communication tool that guides the nurse when a resident has a change in condition

• “SBAR Communication Form and Progress Note for RNs/LPN/LVNs”
  – evaluate the resident’s condition before contacting the clinician/other healthcare professional
  – document the primary care clinician’s recommendations
SBAR Communication Form
and Progress Note for RNs/LPN/LVNs

Before Calling the Physician / NP / PA / other Healthcare Professional:
☐ Evaluate the Resident; Complete relevant aspects of the SBAR form below
☐ Check Vital Signs: BP, pulse, and/or apical heart rate; temperature, respiratory rate, O2 saturation and finger pulse oximetry, for diabetes
☐ Review Record of recent progress notes, labs, medications, other orders
☐ Review an INTERACT Care Plan or Acute Change in Condition Idle Card, if indicated
☐ Have relevant Information available when Reporting
   - i.e., medical record, vital signs, advanced directives such as DNR and other care limiting orders, allergies, medication list

Situation
The change in condition, symptoms, or signs observed and evaluated is ____________________________

This started on _____ / _____ / _____ Since this started it has gotten: ☐ Worse ☐ Better ☐ Stayed the same

Things that make the condition or symptom worse are ____________________________

Things that make the condition or symptom better are ____________________________

This condition, symptom, or sign has occurred before: ☐ Yes ☐ No

Treatment for last episode (if applicable) ____________________________

Other relevant Information ____________________________

Background
Resident Description
This resident is in the facility for: ☐ Long-Term Care ☐ Post-Acute Care ☐ Other: ____________________________

Primary diagnosis ____________________________

Other pertinent history (e.g., medical diagnosis of CHF, DM, COPD) ____________________________

Medication Alerts
☐ Changes in the last week (describe)
☐ Resident is on [Warfarin/NSAID] Result of Lab: __________ Date: _____ / _____ / _____
☐ Resident is on other anticoagulant (direct thrombin inhibitor or platelet inhibitor)

Resident is on: ☐ Hypoglycemic medication; ☐ Insulin ☐ Digoxin

Allergies ____________________________

Vital Signs
BP __________ Pulse __________ (or Apical HR __________) RR __________ Temp __________ Weight __________ lbs; intake __________ / __________ / __________

For CHF, edema, or weight loss last weight before the current one was __________ lbs on __________ / __________ / __________

Pulse Oximetry (if indicated) __________ % on ☐ Room Air ☐ O2 __________

Blood Sugar (if applicable) ____________________________

Resident / Patient Name ____________________________ (continued)
Minnesota Hospital Association (MHA)

- MHA
  - developed LTC-specific Seeing Sepsis Tool Kit
- MHA’s LTC resources
  - Seeing Sepsis cards and posters that alert the user to notify the nurse to screen for sepsis if
    - the resident’s temperature is higher than 100° F,
    - heart rate is greater than 100 beats per minute, and/or
    - systolic blood pressure is lower than 100 mmHg and the resident “doesn’t look right”
  - Act Fast document for LTC
    - same screening alerts plus next steps for medical providers in the event of a positive sepsis screen
Screening for and Recognizing LTC Residents with Sepsis

• The key to survival is to identify sepsis early
• Screening in LTCFs could promote treatment while awaiting transfer
  — saving precious time!

Dellinger, et al.

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Treatment First Steps Include:

• Measuring the lactate level and drawing blood cultures
  – initial steps in the SSC bundle could be accomplished in LTCFs with laboratory capabilities

• Intravenous access and administration of broad spectrum antibiotics and crystalloids
  – next steps in the SSC bundle could be accomplished prior to transfer

Dellinger, et al.
Simulation Training in Healthcare

• Experiential education
  – allows participants to develop new knowledge and skills in a controlled, supported learning environment
  – without direct risk to patients

• Simulation
  – improves critical thinking, performance skills, knowledge of subject matter
  – increases clinical reasoning in certain areas

• Core benefit
  – the measurable improvement in patient safety
Simulation Training for LTC Staff in Early Recognition of Sepsis

• Should include:
  – recognizing early sepsis symptoms
    • Utilizing a standardized screening tool
  – promptly communicating those symptoms among the healthcare team
    • Utilizing a communication algorithm

• Facilitator should lead participants through realistic scenarios
Simulation Debriefing

• Group reflects and engages in **safe** conversations to:
  – identify strengths,
  – weaknesses, and
  – opportunities for improvement

• Participants gain confidence while discussing what went well and what could be improved.
A Study

• Mihaljevic and Howard incorporated interdisciplinary sepsis simulations:
  – in 19 LTCFs in western PA
  – included licensed nurses, CNAs, therapy staff
  – used INTERACT’s Stop and Watch and SBAR tools

• Goal:
  – to communicate effectively and intervene quickly on behalf of residents in sepsis
Study Findings

• Participants completed a survey to provide feedback on their experience:
  – Overwhelming majority
    • found a high level of satisfaction with the experience
    • looked forward to similar education and training in the future
  – Simulation
    • helped implement sepsis education
    • reinforced interdisciplinary communication in the LTC setting
    • stimulated adoption of these tools in many LTC organizations
Electronic Health Records (EHRs)

• The United States is moving toward implementing EHRs in all healthcare facilities.
  – LTC settings have been slow to adopt such technology due to cost

• In 2004, 1,174 nursing homes responded to the National Nursing Home Survey conducted by National Center for Health Statistics at the Centers for Disease Control and Prevention.
  – 42% of the nursing home respondents used an electronic information system for patient medical records

Broughton, et al.
Cherry, et al.
Richard, et al.
EHRs Aid in Detection

• Automated access to information
  – has the potential to streamline clinicians’ workflow
• Clinical decision tools
  – offer the possibility of identifying patients in sepsis
• Diagnosis of sepsis may be elusive to clinicians
  – may not recognize the constellation of clinical, physiologic, laboratory abnormalities that comprise the sepsis syndrome
• Strong potential to improve the detection of sepsis early
  – by collecting and organizing the clinical data required to make the diagnosis
A Study

• Nguyen et al. sought to evaluate the accuracy of an automated EHR sepsis-detection system.

• Authors concluded:
  – a specific EHR clinical support system identified patients presenting with sepsis
  – provided a viable strategy for sepsis identification

• Given the success of Nguyen’s study:
  – LTCFs that use EHRs could consider incorporating their chosen sepsis screening tool into their system to aid in early identification of sepsis.
Sepsis Prevention

• Prevent sepsis from occurring by preventing infections!

• Follow infection control recommendations
  – Hand hygiene
  – Implement device-related bundles
  – Ensure residents receive recommended vaccines
  – Educate patients
Conclusions

• Early recognition of sepsis and implementation of evidence-based therapies have the potential to save lives.

• Despite the prevalence and serious consequences of sepsis, its early diagnosis is challenging for LTC team members; therefore, sepsis may be under-diagnosed when it is still potentially reversible.
Conclusions

• The use of a validated sepsis screening tool by LTCFs to identify sepsis early and to standardize communication among LTC team members, may decrease adverse outcomes.
• Simulation sessions using a sepsis screening tool have been shown to improve the user’s ability to effectively recognize and communicate changes in a resident’s condition that may indicate sepsis.
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Early Detection of Sepsis in Pennsylvania’s Long-Term Care Residents

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ABSTRACT

Sepsis impacts between 900,000 and 3 million people in the United States each year. With a mortality rate of 15% to 30%, it is the leading cause of death from infection. Sepsis incidence increases disproportionately in older adults. Over a two-year period, 468 potential occurrences of sepsis with 17 potential sepsis-related fatalities were recorded for residents in long-term care in Pennsylvania. Recognizing early sepsis and implementing evidence-based therapies are actions that improve outcomes and decrease mortality. Despite the prevalence of sepsis and its serious consequences, awareness remains low, and sepsis is frequently under-diagnosed early, when it is still potentially reversible. The signs of both infection and organ dysfunction may be subtle, and
References

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