Sepsis Management Across the Care Continuum

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Qualis Health

- A leading national population health management organization
- The Medicare Quality Innovation Network - Quality Improvement Organization (QIN-QIO) for Idaho and Washington
- Medicare.QualisHealth.org
Objectives

• Sepsis definition and impact on hospital admissions and readmissions
• Sepsis treatment
• Prevention and early recognition in Post-acute care: Kitsap Community, WA
• Prevention and early recognition in outpatient settings: Greater Canyon County, ID
Sepsis Definition and Impact
SEPSIS

- Sepsis is the body’s overwhelming and life-threatening response to infections which can lead to tissue damage, organ failure, and death
- It is difficult to predict, diagnose and treat
- Patients who develop sepsis have an increased risk of complications and death and face higher healthcare costs and longer treatment

http://www.cdc.gov/sepsis/index.html
SEPSIS, A CONTINUUM

SIRS
SIRS + Infection
Temp. >38°C or <36°C, HR >90, RR >20 or PaCO₂ <32,
WBCs >12,000 or <4,000 or >10% bands

Sepsis
Sepsis + Infection

Severe Sepsis
Sepsis + End Organ Damage

Septic Shock
Severe Sepsis + Hypotension

https://my.vanderbilt.edu/sepsismonitor/progress-reports/
Sepsis is expensive and bad for you

$\$\$ per stay  $45,000 severe sepsis
$18,500 all sepsis

Total Cost  $15.4B, 2009

ALOS  8.3 days

Mortality (inpatient)  16%


Rate and Recurrence

• Rate of sepsis is high and rising:
  • 1 of every 23 hospitalized patients
  • Primary Dx rose by 148%, secondary Dx by 66% between 2000 – 2009

• **Sepsis recurs:**
  • 16% annual recidivism rate for Sepsis Dx


Who is at Higher Risk for Sepsis?

- Income
- Education
- Alcohol Use
- Tobacco Use
Who is at Higher Risk for Sepsis?

Chronic Conditions:
- Chronic lung disease
- Peripheral arterial disease
- Chronic kidney disease
- Myocardial infarction
- Diabetes
- Stroke
- More than one chronic condition

Other Conditions:
- Cancer treatment (neutropenia)
- Immunocompromised
- Maternal/perinatal
Percent of Incidence Sepsis Hospitalizations

- Pneumonia: 44%
- Kidney/UTI: 16%
- Abdominal: 14%
- Bronchitis/Flu: 9%
- Skin/Soft Tissue: 7%
- Sepsis: 7%
- Fever: 1%
- Unknown: 1%
- Surgical Wound: 0%
- Vascular Catheter: 0%
- Meningitis: 1%

Preventable* Readmissions

Preventable* Readmissions

Share of All Re-Hospitalizations by Condition

- **Sepsis**
- **Respiratory**
- **CHF**
- **UTI**
- **Anticoagulant complications**
- **Cellulitis/Wound Infection**
- **Electrolyte Imbalance/Dehydration**
- **Blood Pressure Management**
- **Delirium**
- **Pressure Ulcers**
- **Adverse Drug Reaction**
- **Hypoglycemia / Diabetic Complications**

ID (2012 - 2014), Total 47.1%
ID (2015), Total 38.4%
Sepsis Diagnoses Associated with Readmissions

• #/% Hospitals with sepsis as the #1 (highest volume) index admission diagnosis of readmitted patients
  • ID: 7/9 (77.8%)
  • WA: 33/43 (76.7%)

• #/% Hospitals with sepsis as the #1 (highest volume) readmission diagnosis of readmitted patients
  • ID: 8/9 (88.9%)
  • WA: 35/43 (81.4%)
Sepsis Treatment
How Sepsis is Treated

Focus is on treating the underlying infection while supporting vital functions impacted by the inflammatory response

• Antibiotics
  • To combat infection – start immediately and change therapies once culture results are identified

• IV fluid support
  • To combat hypovolemia which leads to hypoperfusion and end-organ damage

• Additional BP support with vasopressors
  • If fluids are insufficient to restore tissue perfusion

• Oxygen, other measures as indicated by end-organ damage
  • E.g., intubation, dialysis, etc.
CMS Hospital “Sepsis Bundle”

For SEVERE SEPSIS

• Within **3 hours** of presentation:
  - Measure initial lactate level
  - Draw blood cultures prior to administration of antibiotics
  - Administer broad spectrum antibiotics

• Within **6 hours** of presentation
  - Repeat lactate measurement if initial lactate level was elevated
CMS Hospital “Sepsis Bundle”

• *For SEPTIC SHOCK*
  
  • Within 3 hours of presentation
    - Resuscitate with 30 ml/kg crystalloid fluids
  
  • Within 6 hours of presentation
    - Administer vasopressors
      - *If hypotension persists in the hour after administration of fluids*
    - Assess volume status AND tissue perfusion
      - *If hypotension persists in the hour after administration of fluids, or*
      - *If initial lactate level was greater than 4 mmol/L*
Early Recognition and Management of Sepsis Outside the Hospital Setting
Looking Upstream of the Hospital

• Onset of 79.4% of sepsis cases occurred outside of a hospital setting
• The majority of Sepsis admissions had recent interactions with the health care system prior to that admission
• 18% admissions for sepsis were from nursing home/skilled nursing facility
• *Is there an opportunity for (earlier) recognition?*

Novosad, S. et.al. Epidemiology of Sepsis: Prevalence of Health Care Factors and Opportunities for Prevention, MMWR, 2016: 65
Skilled Nursing Facilities
SNFs: Vital Signs are Vital

How often do you monitor vital signs on patients with possible sepsis?

- Do you track vital signs over time?
- Consider increasing frequency for patients with infections
- How do you assess respiratory rates?
- Is vital sign assessment part of nursing competency assessment?
- Is (or could) signs and symptoms of sepsis be taught to other SNF staff (ie housekeeping, CNAs, therapists)

Chester, J. Vital Signs in Older Patients: Age-Related Changes. JAMDA 2011
Sepsis Screens Appropriate for Skilled Nursing Facilities

- 2 or more SIRS signs plus infection
- qSOFA
- “shock index” = HR/SBP
  - If >/= 0.9 plus infection

These would trigger the team’s response to suspected sepsis!
qSOFA as a clinical prompt

- 3 variables
- Measured near onset of infection
- No laboratory tests
- Studied in 72 → 6 hr windows around infection

Thanks to Christopher W. Seymour, MD, MSc, CRISMA
Shock Index: HR/SBP

If HR>SBP, suspect sepsis

Evidence shows that HR/ SBP $\geq 0.9$ should trigger sepsis protocol including evaluation for organ failure.
Skilled nursing facility sepsis algorithm for adults

Suspected infection and 2 or more SIRS criteria
- Fever/chills
- Currently on antibiotics
- Cough/SOBS
- Cellulitis/wound drainage
- Weakness

SIRS criteria
- Temp ≥100.0 or ≤96.8
- Pulse ≥100
- BP <100 or >40 mmHg from baseline
- Resp. rate ≥20/SpO2 <90%
- Altered mental status

SIRS = Systemic Inflammatory Response Syndrome

Positive screen for sepsis

Prior to calling provider
- Educate resident/family about status
- Review Advance Directives and options

Notify provider

Early detection tool
100-100-100

Negative screen for sepsis

Transfer
- Prepare transfer sheet
- Call ambulance
- Call report to hospital
- Report positive sepsis screen

Stay in facility
If Advance Directives and/or resident’s wishes are in agreement, consider some or all of following order options:
- Labs: CBC w/Diff, lactate level (if possible), UA/UC, blood cultures if able; from 2 sites, not from lines. Send all labs ASAP.
- Establish IV access for the following:
  - IV normal saline 0.9% @ 30ml/kg if BP <100
  - Administer IV, IM or PO antibiotics
  - Comfort care

Monitor for progression into Multisystem Organ Dysfunction Syndrome
- Progression of symptoms despite treatment
- Urine output <400ml in 24 hours
- SBP <90 despite IV fluids
- Altered mental status
- Consider transferring to another level of care - hospital, palliative, or hospice

Comfort care
- Pain control
- Analgesics for fever
- Reposition every 2-3 hrs
- Oral care every 2 hrs
- Offer fluids every 2 hrs
- Keep family informed
- Adjust care plan as needed

Could also use qSOFA or shock index

Thanks to Minnesota Hospital Association
SNF Tips

• Realize that sepsis is common and that many of your patients are vulnerable
• Require warm handover at the time of admission of a post-sepsis patient
• Take vitals often and track over time
• Choose a standard sepsis screen
• Create a suspected sepsis protocol and train all clinical staff to it
  • Consider POC testing
• Remember advance directives
WA State: Kitsap Community

Community Performance Report

Purpose of the Report
This report was developed as a tool for the prevention of hospital readmissions and to improve the quality of care within the community. It is intended to support efforts within the community to improve care transitions and reduce hospitalizations.

The most recent edition is available at: [www AviationQualityNet.org/CommunityPerformanceReport]

Catherine Druce-Smith, Hospitalist RN
Sound Physicians
Early Sepsis Screening: 
Reaching Out to Our Post-Acute Partners

Rana Tan, Chief Hospitalist
Catherine Druce, Hospitalist RN

Harrison Medical Center – Bremerton, WA
Background

- Harrison Medical Center is part of CHI Franciscan Health
- 269 bed hospital located in Bremerton, Washington
- Served Kitsap County since 1918
- Level III Trauma Center serving 80,000 Emergency Visits
- Sound Physicians partnered with Harrison Medical Center in 2002
Why care about Sepsis?

37% to 55% of hospital deaths can be attributed to a sepsis diagnosis

JAMA 2014; 312
Sepsis Mortality: Harrison Medical Center

Q1 2016

- 35 patients deceased with primary / secondary diagnosis of Severe Sepsis/ Septic Shock
- 20 (57%) patients presented from a Post Acute Facility with a diagnosis of sepsis
- 15 (43%) patients presented directly to the Emergency Department from home or from their PCP office

Data: Harrison Medical Center Quality Department
Sepsis Education for Post Acute RNs
June 24th 2016

• Presented to twenty-five Post Acute and Assisted Living staff nurses
• Very engaged group
• Presentation by Rana Tan, MD on the Pathophysiology, Management and Treatment of Sepsis
• Focus on the idea that sepsis is a TIME-SENSITIVE diagnosis, similar to stroke and acute myocardial infarction
• Presentation by Harrison Medical Center Educators on Sepsis Screening Tool and Care of the Septic Patient
• Identified goals moving forward
Sepsis Screening Tool: Evaluate

- Pneumonia
- Urinary tract infection
- Skin/ soft tissue infection
- Bone/ joint infection
- Wound infection
- Bloodstream catheter infection
- Acute abdominal infection
- Meningitis
- Endocarditis
- Implantable device infection
Sepsis Screening Tool: Assess

- **Acutely altered mental status/confusion**
- **Tachycardia:** heart rate greater than 90 bpm
- **Hypothermia:** temp less than 36 degrees (96.8)
- **Hyperthermia:** temp greater than 38.3 degrees Celsius (101 Fahrenheit)
- **Hypotension:** SBP < 90 (late sign)
Goals

• Early identification and treatment

• Communicate with attending physician or primary care provider (Post Acute Facility)

• Consider early transfer to the Emergency Department

• Communicate with EMS: “rule out severe sepsis”

• Education on the Sepsis Screening Tool to EMS
REMEmBER: Sepsis is a Time-Sensitive Disease

***Time-sensitive interventions can’t happen unless you suspect sepsis as a possible diagnosis

Early Antibiotics

Fluids: 30 cc/ kg
Moving Forward

• Present Sepsis Case Studies to SNF administrators with Quality Improvement Interact Tool (monthly)

• Utilize Sepsis Tracking Form in the Post Acute Facilities- shared with Emergency Department

• Protocol for early fluid intervention in the Post Acute setting

• Ongoing education to Post Acute RNs (Include Assisted Living Facilities)
Outpatient Settings
How to address sepsis in outpatient settings?

Develop standards: Alert, Screen, Respond

Your elderly patients are at risk!
Have a high level of suspicion and know how to respond

• Early management is critical
Screens used by EMS

• BAS 90-30-90\(^1\)
  • Systolic BP<90
  • Respiratory Rate>30
  • Oxygen Saturation<90

• Robson Screen\(^1\)
  • Temp>38.3°C (100.9°F) or <36°C (96.8°F)

• Press score\(^2\): older age, Nsg home, EMD = “sick person”, hot tactile temp, low SBP, low oxygen saturations

Ambulatory-Setting Tips

• **Recognize** that sepsis is more common in elderly and compromised patients (immunocompromised, multiple chronic conditions, cancer treatment)

• **Choose** a standard sepsis screen
  - 2 or more SIRS signs plus infection
  - qSOFA
  - Shock index
  - Specialty/condition-specific screen (ie maternal assessment)

• **Train** staff on screen use

• **Transfer** sepsis-screen positive patients to the emergency room
What about Negative Screens?

• Identify patients *with confirmed or possible infections* that screen negative for sepsis
  • Are they at high risk for sepsis?
  • What kind of follow-up should they have?
  • Is there someone to evaluate them at home?
• Educate patients on your sepsis screen criteria and what to look for at home (ie tracking vital signs)
What are the symptoms of sepsis?

There is no single sign or symptom of sepsis. It is, rather, a combination of symptoms. Since sepsis is the result of an infection, symptoms can include infection signs (diarrhea, vomiting, sore throat, etc.), as well as **ANY** of the **SYMPTOMS** below:

- Shivering, fever, or very cold
- Extreme pain or discomfort
- Clammy, or sweaty skin
- Confusion or disorientation
- Short of breath
- High heart rate
Patient/Caregiver Education

How can I prevent sepsis?

1. **GET VACCINATED** against the flu, pneumonia, and any other infections that could lead to sepsis. Talk to your doctor for more information.

2. **PREVENT INFECTIONS** that can lead to sepsis by:
   - Cleaning scrapes and wounds
   - Practicing good **hygiene** (e.g., hand washing)

3. **LEARN THE SIGNS AND SYMPTOMS** of sepsis.
   If sepsis is suspected, seek medical attention immediately.

http://www.cdc.gov/sepsis/basic/index.html
Population-specific Education

CANCER, INFECTION AND SEPSIS FACT SHEET
A POTENTIALLY DEADLY COMBINATION EVERY CANCER PATIENT SHOULD KNOW ABOUT

Why does cancer put me at risk for developing INFECTION?
Having cancer and undergoing certain treatments for cancer can make your body unable to fight off infections efficiently.

What is the difference between infection and SEPSIS?
An INFECTION occurs when germs enter a person's body and cause damage to tissue, organ and tissue damage, or disease. For cancer patients, it can be deadly very fast.

SEPSIS is a complication caused by the body's overwhelming response to infection which can lead to tissue damage person with cancer, any infection that is anywhere in the body.

How does chemotherapy increase my risk for SEPSIS?
Chemotherapy works by killing the fastest-growing cancer cells and decreasing the immune system. This means that along with killing cancer cells, it also decreases the body's infection-fighting white blood cells.

LIFE AFTER SEPSIS FACT SHEET
WHAT SEPSIS SURVIVORS NEED TO KNOW

ABOUT SEPSIS
What is sepsis?
Sepsis is a complication caused by the body's overwhelming and life-threatening response to an infection, which can lead to tissue damage, organ failure, and death.
ID: Greater Canyon County

Wendy Dougherty, RN, MHA
Saint Alphonsus Nampa
Greater Canyon County Community Coalition

Wendy Dougherty, RN, MHA
Manager Clinical Resource Management, Social Work, and Transitions of Care

November 14, 2016
Canyon County, Idaho

- White alone: 71%
- Hispanic or Latino: 24.8%
- High School Graduate or Higher: 82.9%
- Bachelor's Degree or Higher: 17.4%

Estimated Population: 207,478
Saint Alphonsus Medical Center- Nampa, Idaho

- New Build opening Spring of 2017

- Small rural hospital
- 150 licensed beds
- Average Daily Census-50-70
The Early Coalition

- Began as a two County Treasure Valley Coalition
- Group - Too Large
- Data - Too variable
- Split into separate County Coalitions
- Built a new charter
- Participation from all types of agencies, hospital, home health, LTACH, PCS, SNFs, ALFs, Payers, Community agencies and the local University
Coalition Goals

• Reduce annual all-cause 30 day readmission rate by 10%
• Share real time data and cases
• Share best practices
• Provide mentoring through data sharing and analysis
• CHALLENGE-Finding a more narrow community wide focus
Focusing In

- Considered multiple disease processes
- Impact needed to be across all levels of care
- Kept the patient at the center-no marketing, no politics
- Triple Aim-Improving community health with high quality care at the lowest cost
- Considerations: COPD, Heart Failure, and Sepsis, among other chronic conditions
- Returned to the Qualis data looking for overall opportunity for impact on quality, mortality, and cost across all settings
- Voted on sepsis
“Superutilizers”

Medicare Beneficiary Use of Hospitalizations

- Benes with 3 or more hospitalizations
- Benes with less than 3 hospitalizations

WA & ID Medicare Claims Data for 2014
Canyon County Super Utilizers

- 101 people had 505 hospitalizations in one year
- 45% of all readmissions
- Use multiple types of services
  - 2 or more hospitals
  - 2 or more SNF
  - HHA
  - Many different physicians
Why Sepsis?

- Surviving Sepsis Campaign-aggressive work toward hospital recognition and management (3 and 6 hour bundles)
- Very little community work around sepsis
- Community with high return to hospital rate for sepsis (high cost), known high risk, known high mortality
- Impacts all levels of community partners
Sepsis Specific Goals

• Outcome Goal: Reduce sepsis infections and re-hospitalization of people who have had sepsis by X% through coordinated community effort to improve information transfer, patient education and activation and outpatient physician practice processes for early treatment by January 2017.

• Process Goal: Engage primary care physicians and practice managers to create a process for quicker response time during clinic hours for early treatment of recognized signs and symptoms of sepsis reported by HHA or NH nurses by January 2017.
Initial Work Groups

• Education Work Group
  – Engage Community Partners (NNU) Lit Search
  – Target “At Risk” Populations
  – Utilize CDC Information
  – Staff/Provider Education
  – Patient Education
  – Community Education
  – Design and Distribution

• PCP Work Group
  – Engage Community Partners
  – Identify Current Gaps
  – Find PCP Representation
  – Key Terms, Consistent Messaging
  – Goal:
    • Accountability
    • Consistency
    • Continuity
Challenges

• Physician Involvement
• Consistent Team Leadership
• PCP staff face to face (gatekeepers)
• Overlap Between Teams
  • Resumed to one team, partnered with NNU
  • Needed the tool developed prior to working with PCPs.
Some common causes of sepsis are lung infections, urinary tract infections, open wounds/cellulitis. Warning signs of infection are listed in the yellow box below. Early treatment of infection can help prevent the infection from causing sepsis.

**What should I do if I think I have an infection or sepsis?** Call your doctor or go to the emergency room immediately if you have any signs or symptoms of an infection or sepsis. This is a medical emergency. It’s important that you say, “I AM CONCERNED ABOUT SEPSIS.”

**Healthy Signs**
- Regular heartbeat
- Normal temperature
- Normal blood pressure
- Normal for YOU

**Warning Signs**
- Call your doctor if you have:
  - Fever
  - New or worsening cough
  - Burning/pain during urination
  - Chills/sweats
  - New onset of pain
  - Diarrhea/Vomiting
  - Nasal congestion/wheezing
  - Redness, soreness, swelling, discharge in surgical site/port
  - New or worsening confusion

**Sepsis Symptoms**
- Go to the ER or call 911 if you have ANY of the following:
  - Shivering, fever or very cold
  - Extreme pain or general discomfort (“worst ever”)
  - Pale or discolored skin
  - Sleepy, difficult to wake up, confused
  - “I feel like I might die”
  - Shortness of breath

Sepsis is the body’s overwhelming and life-threatening response to an infection which can lead to tissue damage, organ failure, and death. Sepsis can be deadly. To learn more go to [www.sepsis.org](http://www.sepsis.org).

**Doctor’s Name:** ____________________________  **Phone:** ____________________________

**Other:** ____________________________  **Phone:** ____________________________

**Notes:**

- Test group of Assisted Living patients and hospital volunteer workers!
- Magnets or laminated flyers!
• Northwest Nazarene University (NNU) built the Coalition’s sepsis project into their community health curriculum.
• Local businesses donated to the design, supplies, and lamination of the tools.
• Current efforts underway to present the tool and education to the healthcare community and begin sharing with patients.
• Engaging infectious disease and community liaisons to assist in physician office penetration
Future State

- Sepsis Community Awareness Day
- Standardized education for all levels of outpatient care providers (family, nurse aides, healthcare workers, church members)
- Begin to identify common health-related social needs of patients (e.g. transportation, food insecurity, housing, utility needs, abuse or neglect) and organize community service collaboration to help patients access needed services by January 2018.
Q & A
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For survey:
https://www.surveymonkey.com/r/37YRZTQ

For more information:
www.Medicare.QualisHealth.org/Transitions

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