EARLY RECOGNITION & TREATMENT OF SEPSIS IN THE SKILLED NURSING FACILITY

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Medical Director – Complex Population Management
Goals

- Recognize and treat sepsis early
- Sepsis program development
- Key expectations and deliverables for team members
- Develop a review and adjustment of sepsis program
Background

- Sepsis is the most common admitting diagnosis for patients that are transferred to hospitals from many skilled nursing facilities.
  - NYU-Lutheran Augustana (2014)
    - Sepsis 33%
    - CHF 12%
- More than 60% of patients who develop severe sepsis in the United States are > 65 years of age \(^{(1)}\).
- Mortality rates for sepsis increase as age increases \(^{(1)}\).
- Early antibiotic treatment decreases mortality in septic patients \(^{(1-3)}\).

National age-specific number and incidence of cases of severe sepsis.

National age-specific mortality rates for all cases of severe sepsis and for cases with or without an associated underlying comorbidity.
Goals of Sepsis Program

- Recognize & Treat Early & Aggressively

- Decrease Cases Progressing to Severe Sepsis

- Decrease Morbidity & Mortality
Progression of Sepsis

SIRS → Sepsis → Severe Sepsis → Septic Shock

SIRS (Systemic Inflammatory Response Syndrome)

- Widespread inflammatory response to microbial invasion or cell injury
- May or may not be due to infection
- Signs & Symptoms
  - Fever or hypothermia, tachycardia, tachypnea, leukocytosis or leukopenia
Systemic Inflammatory Response Syndrome (SIRS)

- **Temperature**: 
  - $< 36^\circ \text{C}$ or $> 38^\circ \text{C}$
  - $< 96.8^\circ \text{F}$ or $> 100.4^\circ \text{F}$

- **White Count**: 
  - $> 12\text{K}$ or $< 4\text{K}$

- **HR**: 
  - $> 90$

- **RR**: 
  - $> 20$
Sepsis

- When SIRS is caused by infection
- Patient has infection plus systemic signs of infection
- **Systemic** inflammation in response to infection
Severe Sepsis

• Sepsis that leads to:
  • Acute organ dysfunction
  • Tissue hypoperfusion
    • Lactate > 2.0 mmol/L
  • Sepsis induced hypotension
    • SBP <90 or MAP <65 or SBP decrease >40 from baseline
Septic Shock

- Severe sepsis with hypotension despite adequate volume resuscitation
- Acute circulatory failure
- Patients with sepsis who require vasopressor support despite adequate fluid replacement are in septic shock
- Lactate > 4.0 mmol/L regardless of BP
- Untreated septic shock is 100% fatal
- Treated septic shock has about a 50% mortality
Progression of Sepsis

SIRS (Screen) → Sepsis (Treat) → Severe Sepsis (Transfer) → Septic Shock
SIRS Criteria (Initiation of Protocol)

- Temp > 100.4 or < 96.8
- WBC > 12,000 or < 4,000 or 10% bands

- Heart Rate > 90*
- Respiratory Rate > 20*

* If patient’s numbers are noted to be at baseline for particular residents, then change HR > 110 and RR > 25
  * If concerned that this is baseline (patient has spikes), recheck in ½ hour and notify if still elevated
Sepsis Protocol

• If one SIRS Criteria met begin SCREEN
  • Urine culture
  • Chest x-ray
  • Comprehensive Metabolic Profile
  • CBC with Diff

• If two SIRS Criteria are met*, begin TREATMENT
  • Place IV
  • Obtain blood culture
  • Start Antibiotic Protocol
  • Start normal saline at 250 ml/H x 2 H, then at 100 mL per hour for a total of 2L
  • If heart failure on diagnosis list the verify rate/fluids with provider
  • * WBC or Temp MUST be one of the two criteria
Antibiotic Protocol

• If patient has a history of infection in the last 6 months, then reinstate the last antibiotic regimen
• If patient has diarrhea then consider po metronidazole
• If no history of recent infection, then start
  • Cefepime 1G IV x 1 dose (renal adj)
  • Vancomycin 1g IV x 1 dose
• Infectious Disease and PCP must be informed to follow up within 24 hours (antibiotic timeout, review of management)
• n.b. ID MUST approve any antibiotics used for more than 7 days.
Antibiotic Stewardship

- **Nursing Home**
  - 40%-75% of antibiotics are excessively broad spectrum, continued too long, or prescribed incorrectly\(^{(1)}\).

- **CDC—Core Elements of Antibiotic Stewardship Programs**\(^{(2)}\)
  - Implement policies that support **optimal** antibiotic use.
  - **Utilize specific interventions** that can be divided into three categories: broad, pharmacy driven and infection and syndrome specific.

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Antibiotic Stewardship & Early Sepsis Treatment

- Few guidelines exist for the initial selection of **empiric antibiotics** in sepsis\(^1\).
- When the potential pathogen or infection source is not immediately obvious, **broad-spectrum** antibiotic coverage directed against both gram-positive and gram-negative bacteria is recommended\(^{1,9}\).
- Poor outcomes are associated with **inadequate** or **inappropriate** antimicrobial therapy (ie, treatment with antibiotics to which the pathogen was later shown to be resistant **in vitro**)\(^{2-8}\).

Sepsis Protocol (First 24 hours)

#1 INITIATE SEPSIS PROTOCOL
- New onset of Fever
- New onset of WBC >12k

#2 Collect SIRS DATA & Allscripts
- Temperature, BP, Pulse
- WBC
- MAP
- Previous Infection

#3 Stratify SIRS
- MAP <65

YES (1 Criteria) SCREEN
- WBC >12K or Temp >101.5

SCREEN
- Urine Culture
- Chest X-Ray
- CMP in AM
- Repeat CBC in AM

YES (2 Criteria) TREAT
- WBC >12K Temp. > 101.5 HR > 110 RR >25

INITIATE TREATMENT (within 4 hrs)
- Place IV
- Obtain Blood Culture
- Start IV NS
- Start Antibiotic Protocol
- CBC, CMP in AM

YES (3 Criteria) TRANSFER
- WBC >12K T > 101.5 HR > 110 RR > 25

TRANSFER TO HOSPITAL
Summary of Sepsis Protocol

- Initiate Sepsis Protocol if patient has new onset fever or white count.
- Collect data using Sepsis Protocol Worksheet.
- Call primary physician (PCP) AND infectious disease (ID).
- Determine Screen, Treat or Transfer.
- PCP or ID must follow up bedside within 24hrs of initiation of protocol (antibiotic timeout, review of management).
- ID must approve use of antibiotic if treatment is to last more than 7 days.
Evaluate for Sepsis
Building The Team

• Leadership
  • Program Leader
    • Identify a single leader for program
    • Medical Directors are highly effective in this role
  • Responsibilities
    • Collaboration & Education
    • Nursing
    • Specialists
    • Primary physicians
    • Ensure timely follow up or patients on protocol and appropriate antibiotic use
    • Data analysis and collection
    • Review and improvement of program at set intervals (eg., quarterly)

• Infectious Disease Co-Leader
  • Identify a single infectious disease specialist
    • Expert infectious and antibiotic skill sets
    • Access and ability to interpret bacterial resistance data
    • Selection of broad spectrum antibiotic when etiology of infection is unknown
    • Review of individual cases to ensure best practices are followed concerning antibiotic usage

• Nursing
  • Identify a single nursing leader for the program
  • In-servicing
  • Protocol Implementation
Medical Director Guidelines ©2014 HANYS

• General Principles
  • Medical Director is The Physician Leader in the facility.
    • Large shadow that promotes culture of excellence and patient centric care.
  • Unique Role to Coordinate and Collaborate with the health care team.

• “Assess the current resident population and identify current programmatic and educational needs”
• “Develop new clinical programs…”

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Medical Director Guidelines
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• Function 1 - Administrative
• Function 2 - Professional Services
• Function 3 - Quality Assurance & Performance Improvement
• Function 4 - Education
• Function 5 - Employee Health
• Function 6 - Community
• Function 7 - Rights of Individuals
• Function 8 - Social, Regulatory, Political & Economic Factors
• Function 9 - Person-Directed Care

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Function 3—Quality Assurance & Performance Improvement

Task 1 The medical director participates in monitoring and improving the facility’s care through a quality assurance and performance improvement program that encourages self-evaluation, anticipates and plans for change, and meets regulatory requirements.

Task 2 The medical director applies knowledge of state and national standards for nursing home care to help the facility meet applicable standards of care.

Task 3 The medical director monitors physician performance and practice.

Task 4 The medical director helps ensure that the facility’s quality assurance and performance improvement program addresses issues that are germane to the quality of patient care and facility services.

Task 5 The medical director helps the facility use the results of its quality assurance and performance improvement program findings, as appropriate, to update and improve its policies, procedures and practices.

Task 6 The medical director participates in quality review of care, including (but not limited to) areas covered by regulation.

Task 7 The medical director sets an overall culture of quality with person-centered care as a primary value.
• **Function 4—Education**
  
  • Task 1 The medical director sustains his or her professional development through self-directed and continuing education.
  
  • Task 2 The medical director helps the facility educate and train its staff in areas that are relevant to providing high quality patient care.
  
  • Task 3 The medical director serves as a resource regarding geriatric medicine and other care-related topics, and helps the staff and practitioner identify and access relevant educational resources (e.g., books, periodicals and articles).
  
  • Task 4 The medical director informs attending physicians about policies and procedures and state and federal regulations, including updates.
Sepsis Clinical Project Team - Example

- Rick Chou, DO – Medical Director*
- Jeanne Carey, MD – Infectious Disease*
- Linda Olsen, RN – Assistant Director of Nursing*
- Lily Zhu, NP*
- Eugene Gibilaro, MD – PCP, Critical Care
- George Apergis, MD – PCP, Critical Care
- Qiyuan Chen, MD – PCP
- Victor Goldbetter, MD – PCP
- Spiro Demetis, MD – Medical Director Ventilator Unit
- Steven Riso, MD – PCP Ventilator Unit
- Naser Yazigi, MD – Infectious Disease
- Raymond Walsh, MD – Orthopedics
- Enrico Ascher, MD – Vascular Surgery
- Steven DiCrescento, Pharm – Director Pharmacy LMC

*Champions
Skill Sets and Resources

- Intravenous access
- Intravenous antibiotics available in the facility
- Infectious Disease Physician
- Clinical follow up within 24 hours
  - Physician or midlevel provider
    - Access to infectious disease leader or representative
    - Trained and in-serviced to facility’s sepsis program
- Laboratory Bacterial Culture Data
  - Urine, blood etc
Metrics

- Outcomes
  - Readmission rates
  - Mortality
  - Antibiotic Usage
  - Antibiotic Resistance

- Process
  - Timeliness
    - Initiation to informing PCP
    - Initiation to Antibiotic
    - Initiation to IVF
    - Symptoms to Initiation
    - Initiation to bedside evaluation by ID
    - Initiation to bedside evaluation by PCP