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# IPRO Quality Innovation Network-Quality Improvement Organization (QIN-QIO)

## Early Recognition of Sepsis for Improved Resident Outcomes

IPRO New Day Conference  
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# Sepsis

***Sepsis is a life-threatening condition that arises when the body's response to an infection injures its own tissues and organs***<sup>1</sup>

**Sepsis is a leading cause of death and healthcare spending globally**<sup>2,3</sup>



1. Singer, et al. JAMA 2016;315(8) 801-810
2. Fleischmann, et al. Am J Resp Crit Care Med. 2016; 193:259-272
3. Iwashyna, et al. J Am Geriatr Soc. 2012;60:1070-1077



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# Why Community Based?

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- **> 87% of sepsis cases originate in the community**
- Sepsis mortality is largely preventable with early detection and appropriate treatment
- **Just 58% of U.S. adults have heard of sepsis**
- Sepsis diagnosis often missed by healthcare providers
- Sepsis is the #1 reason for 30-day hospital readmissions



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# Sepsis Awareness

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- Sepsis is the leading cause of death in the U.S. <sup>1</sup>
- Sepsis is one of the most under recognized and misunderstood conditions by healthcare providers and the public
- Earlier recognition of the signs and symptoms of sepsis with prompt treatment can lead to improved health outcomes
- Healthcare providers can benefit from improved clinical prompts to facilitate earlier identification of sepsis

1. Liu V, et al. "Hospital Deaths in Patients With Sepsis From 2 Independent Cohorts." JAMA. 2014;312(1):90-92



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# Sobering Statistics

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- An estimated 350,000 adults die from sepsis every year in the U.S. – one every 90 seconds. This is more than those who die from stroke, prostate cancer, breast cancer, and opioid overdose combined. <sup>1</sup>
- Sepsis can be caused by any infection, whether fungal, viral, parasitic, or bacterial, and not all of these pathogens can be cultured. In up to half of septic patients, no pathogen is identified. <sup>2</sup>
- As many as 80% of septic shock patients can be saved with rapid diagnosis and treatment. <sup>3</sup>
- Missed infections are the third most common cause of diagnostic errors identified in medical malpractice cases. Sepsis is the most common condition among missed infections in diagnostic errors. <sup>4</sup>

1. JAMA Network Open. 2020;3(4):e202899JAMA. 2017;318(13):1241-1249

2. Crit Care Med 2006

3. National Highway Traffic Safety Administration. Traffic Safety Facts 2003

4. Diagnosis. 2019;6(3):227-24



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# Sepsis in Long-Term Care

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- Nursing home residents are seven times more likely than non-nursing home residents to develop severe sepsis due to advanced age and weakened immune systems, according to NIH
- Nursing home residents with severe sepsis, compared to non-nursing home residents, have significantly higher rates of ICU admission, hospital LOS and in-hospital mortality
- Older adults and nursing home residents have a disproportionately high incidence and account for a large proportion of ED visits for severe sepsis.
- Nursing home residents have a particularly high morbidity and mortality from severe sepsis



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# Considerations for the Elderly

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- Elderly constitute 1/5 of the US population but 2/3 of patients admitted to the hospital with sepsis<sup>1</sup>
- Risk factors specific to this demographic
  - Increased incidence of chronic co-morbidities<sup>2</sup>
  - Prone to UTIs- a common source of sepsis<sup>3</sup>
  - Malnutrition is common in the elderly
  - Increased incidence of colonization by drug resistant bacteria<sup>4</sup>
  - Declining immune functionality (more susceptible to infections)

1. *Crit Care Med.* 2006;34:15-21

2. *Crit Care Med.* 2007;35:1244-1250

3. *North Am.* 2001;30:313-334

4. *N Engl J Med.* 1978;298:1108-1111



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# Considerations for the Elderly

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- **Urinary tract infections (UTIs) are a common source of sepsis**
  - Elderly are more at risk for UTIs
  - Especially those with indwelling urinary catheters
  - UTI symptoms can differ from those of younger people
    - Confusion
    - Agitation
    - Poor motor skills or dizziness
    - Falling
    - Other behavioral changes
- UTIs in elderly are often mistaken for early dementia or Alzheimer's Disease (NIH)



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# Sepsis and Infection

- Sepsis is **always triggered by an infection**
- Sometimes people don't know they have an infection
- Sometimes the causative agent of the infection is not identified
- Sepsis diagnosis is sometimes missed due to various manifestations of sepsis
- **Conversely: If symptoms of sepsis exist, a source of infection should be sought**



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# Early Signs of Sepsis

***Sepsis always develops from an \*infection  
with more than one of the following:***

- Fever, shivering, feeling very cold
- Cool extremities or mottling of skin
- Rapid heart rate
- Rapid breathing
- Shortness of breath
- Confusion or difficult to arouse
- Complaints of extreme pain
- Pale/discolored skin
- Clammy sweaty skin

**\* Confirmed or suspected**



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## Other Early Clinical Signs May Include...

- **Decreased blood pressure**
  - (SBP <90mmHg or SBP decrease >40mmHg)
- **Other signs of altered mental status**
- **Decreased urine output / dark, concentrated urine**
- **Abnormal lab tests**
  - Increased lactate level
  - Increased creatinine
  - Decreased platelet count
  - Coagulation abnormalities
  - Hyperglycemia in absence of diabetes



# Time to Treatment is Critical

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- **Mortality increases by 4-9% for every hour that appropriate treatment is delayed**
- Early identification and treatment are the keys to improved outcomes



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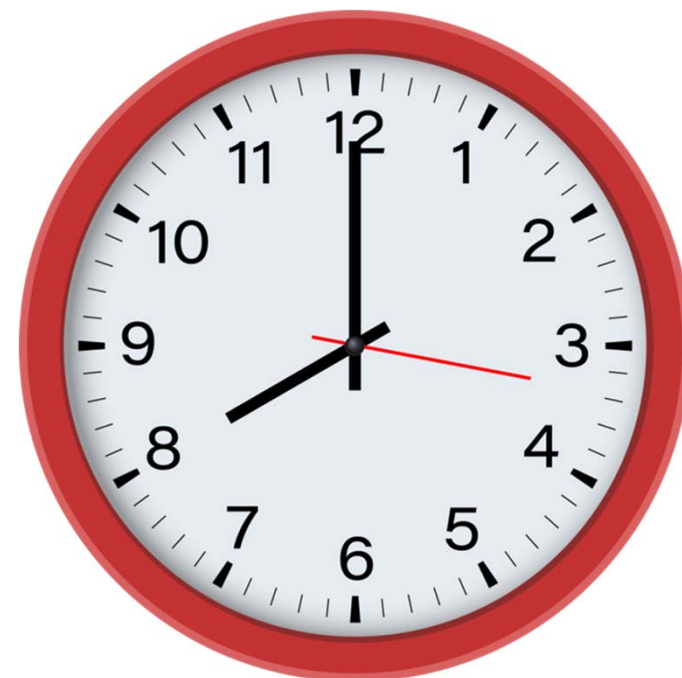
# Every Minute Counts!

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## TREAT SEPSIS AS A MEDICAL EMERGENCY

NOTIFY PHYSICIAN ASAP IF RESIDENT EXHIBITS THE SIGNS OF SEPSIS

- Sepsis is treatable and can be prevented from progressing to septic shock...BUT it must first be suspected!
- Early, prompt recognition and treatment improves survival rates



1. *Crit Care Med*, 2006; 34: 1589-96.



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# Early Recognition is Important

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## Early detection and treatment is critical to:

- Decrease morbidity and mortality related to sepsis
- Avoid long term health-related complications
- Potentially avoiding sepsis-related hospitalizations

*We have a great opportunity to educate residents, family, friends and co-workers*

**Your prompt actions could save a life!**

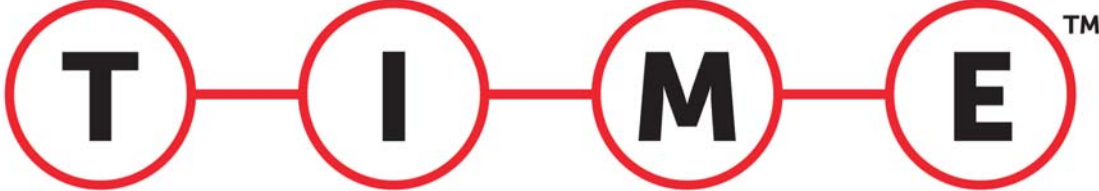
## If Not Treated Promptly...

- Sepsis can result in:
  - Organ Failure
  - Tissue Damage
  - Death



# Sepsis


When it comes to sepsis, remember **IT'S ABOUT TIME™**. Watch for:



**T** **I** **M** **E**<sup>TM</sup>

<b>TEMPERATURE</b> higher or lower than normal	<b>INFECTION</b> may have signs and symptoms of an infection	<b>MENTAL DECLINE</b> confused, sleepy, difficult to rouse	<b>EXTREMELY ILL</b> severe pain, discomfort, shortness of breath
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If you experience a combination of these symptoms: seek urgent medical care, call 911, or go to the hospital with an advocate. Ask: "Could it be sepsis?"

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# Who is at Risk for Sepsis?

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***Anyone with an infection!***

Those at ***higher risk*** for developing sepsis include:

- People 65 or older
- Infants less than 1 year old
- People with chronic illnesses: diabetes, cancer, AIDS
- People with weakened immune systems
- People recently hospitalized
- People recovering from surgery
- People who have had sepsis in the past



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# Common Infectious Diseases That May Progress to Sepsis

- Pneumonia
- Skin Infections (cellulitis)
- Urinary Tract Infections
- Post-partum Endometritis
- Influenza
- *Clostridium difficile* (*C.diff*) Enteritis
- Tick-borne Infections especially in the immunocompromised



# 2012 Definitions for Sepsis

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## Systemic Inflammatory Response Syndrome (SIRS)

- SIRS is nonspecific and can be caused by: infection, inflammation, trauma, ischemia or several insults combined

**SEPSIS = INFECTION + 2 OR MORE SIRS CRITERIA**

- SIRS Criteria:

- Fever >101°F
- Hypothermia <96.8°F
- Heart rate >90 beats/minute
- Respiratory rate >20 breaths/minute
- WBC >12 or <4 or >10% bands

- *Note: SIRS can exist without progressing to sepsis*



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# Progression of Sepsis

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**If not treated promptly, sepsis can progress!**

**INFECTION + 2 or more SIRS criteria**



**SEPSIS**

**SEPSIS + NEW ONSET ORGAN INJURY**



**SEVERE SEPSIS**

**SEVERE SEPSIS + REFRACTORY HYPOTENSION  
OR TISSUE HYPOXIA (ELEVATED LACTATE)**



**SEPTIC SHOCK**



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# 2016 Definitions for Sepsis

## Third International Consensus Definitions for Sepsis and Septic Shock (Singer, et al. JAMA 2016;315(8) 801-810)

### Utilizes SOFA criteria: Sequential Organ Failure Assessment Score

- qSOFA (Quick SOFA) Criteria:
  - Better predictor of patient outcomes for non-hospital and non-ICU settings (vs. SIRS criteria)
  - Appropriate and easy to use in the outpatient setting
    - 2 of the 3 criteria provides simple bedside criteria to identify adults with suspected infection who are likely to have poor outcomes
    - Altered mental status
    - Hypotension ( systolic <100mmHg)
    - Increased respiration rate (>22 breaths per minute)



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# Post Sepsis Syndrome

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## Affects up to 50% of sepsis survivors

- **Post-sepsis syndrome is a condition that can result in physical and/or psychological long-term effects, such as:**
    - Impaired cognitive function-especially among older patients
    - Mobility impairments (muscle weakness)
    - Amputations
    - Hallucinations
    - Loss of self-esteem
    - Increased dependency on others
- \*Higher risk for patients with an ICU or extended hospital stay



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# Talking with Residents & Families

**Start the discussion by asking if they have heard of sepsis**  
*(If they have let them tell you what they know)*

**Share key points about sepsis:**

- **The body's overactive/often life-threatening response to an infection anywhere (skin, urine, respiratory etc.)**
- **Anyone with an infection may be at risk for developing sepsis**
- **Early signs and symptoms; fever/feeling cold, sleepy/confused, short of breath, rapid heart rate, decreased /dark urine**
- **Its important that you let your caregiver know if you experience any of the above**

**Sepsis is a medical emergency!**

1. *N Engl J Med* 2009; 360: 1418-1428



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# How You Can Help

- Familiarize yourself with the early signs of sepsis
- Know who is at high risk for sepsis
- Educate residents, family, friends and loved ones about the signs & symptoms of sepsis
- Be cognizant of health literacy and its implications:

Explain information to patients in a manner they can understand

**Teach Back Method**



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# IPRO Sepsis Train-the Trainer Training Content Outline

- Sepsis Alliance video “SEPSIS: EMERGENCY”
- Identification of high-risk populations
- Evidence supporting community-based sepsis awareness
- Recognizing early signs/symptoms
- Treatment strategies
- Sepsis Self Management Tool
- Post sepsis syndrome
- Preventative measures
- Facility based training process

IPRO Sepsis Initiative  
<http://stopsepsisnow.org>



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# Resources

## **CDC “Get Ahead of Sepsis Campaign”:**

<https://www.cdc.gov/sepsis/get-ahead-of-sepsis/index.html>

## **Sepsis Alliance:**

<http://www.sepsis.org/>

## **Rory Staunton Foundation:**

<https://rorystauntonfoundationforsepsis.org/>

## **IPRO Sepsis Initiative**

<http://stopsepsisnow.org>

## **Surviving Sepsis Campaign:**

<http://www.survivingsepsis.org/Pages/default.aspx>



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## For More Information

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**IPRO QIN-QIO Website:**  
[IPRO NQIIC – Better Healthcare, Realized](#)

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<http://stopsepsisnow.org>