



Indiana
Department
of
Health

Sepsis

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OUR MISSION:

**To promote, protect, and improve
the health and safety of all Hoosiers.**

OUR VISION:

**Every Hoosier reaches optimal health
regardless of where they live, learn,
work, or play.**



Objectives

- Identify signs and symptoms of infection
- Identify ways to improve sepsis early detection and treatment
- Discuss the significance of early detection and the importance of early intervention of sepsis
- Recognize how to improve sepsis identification, surveillance, prevention and treatment
- Recognize long-term challenges for sepsis survivors

House Bill 1275

April 29, 2019

Sepsis treatment guidelines:

- Require a hospital to adopt, implement and periodically update evidence-based sepsis guidelines for the early recognition and treatment of patients with sepsis, severe sepsis or septic shock that are based on generally accepted guidelines.
- Exempts certain hospitals.
- Establishes the sepsis treatment guideline task force (task force). Assigns the task force certain duties concerning evidence-based sepsis guidelines, best practices, education materials and appropriate data measures.
- Requires the state department of health to prepare a report on the implementation of the sepsis guidelines.

[House Bill 1275 - Sepsis treatment guidelines - Indiana General Assembly, 2019 Session](#)

What is SEPSIS?

- Sepsis is the body's extreme response to an infection. It is a life-threatening medical emergency.
- Sepsis happens when an infection you already have triggers a chain reaction throughout your body.
- Infections that lead to sepsis most often start in the lung (44% adults), urinary tract (21% adults), gastrointestinal tract (21% adults) and skin (6% adults).
- Without timely treatment, sepsis can rapidly lead to tissue damage, organ failure and death.

[What is sepsis? | Sepsis | CDC](#)

911 Emergency

We should emphasize the need for quick recognition of symptoms and treatment like we would do for heart attack and stroke.

[Hospital Toolkit for Adult Sepsis Surveillance \(cdc.gov\)](#)

Fast recognition and treatment can increase the chances of survival.

Sepsis Pathogenesis

- Infection-initiated systemic inflammatory syndrome.
- Sepsis occurs when an infection already in the lungs, skin, urinary tract or somewhere else triggers a life-threatening chain reaction throughout the body.
- Effector cells from the innate and adaptive immune systems play a crucial role in sepsis.

Sepsis Risk Factors

- Adults 65 or older
- Immunocompromised
- Chronic medical conditions, such as diabetes, lung disease, cancer or kidney disease
- Neutropenia
- Sepsis survivors
- Weakened immune systems
- Recent severe illness or hospitalization
- Indwelling catheter or IV
- Burns or wounds
- Children younger than 1

Impact on the elderly

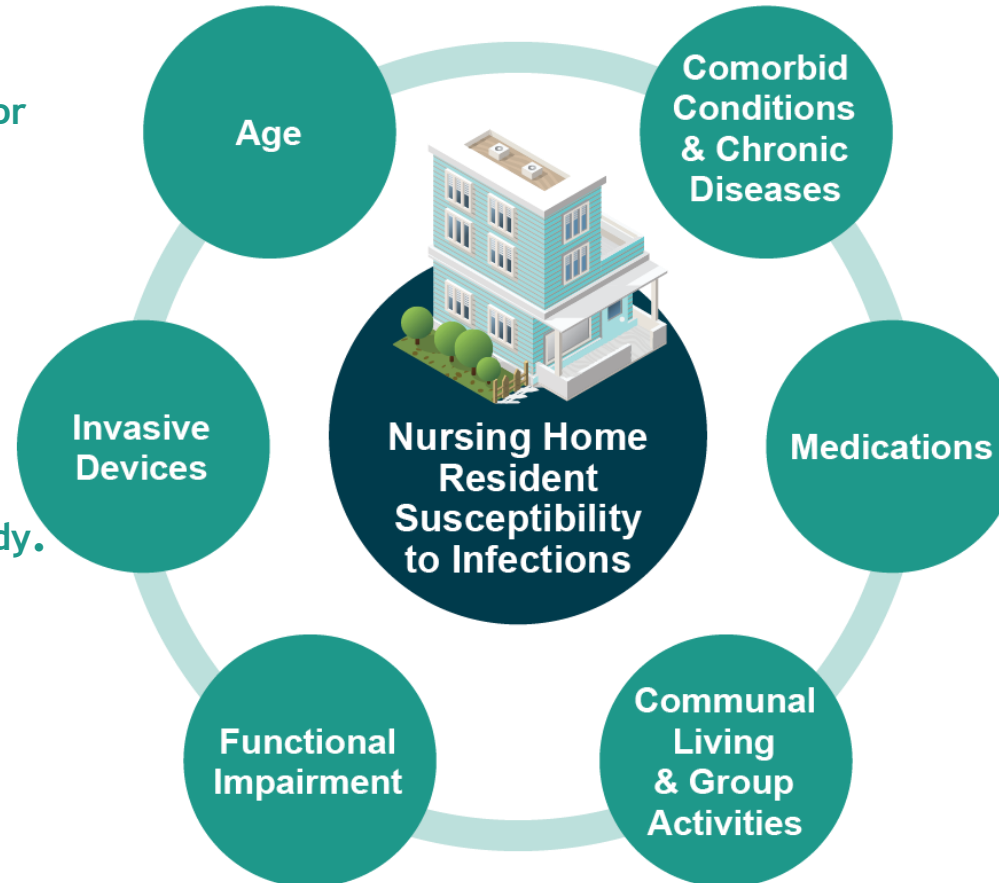
Age itself is an independent risk factor for death:

- Patients over the age of 65 have an increased chance of acquiring infection and sepsis related to decreased functioning of the immune system, presence of one or more comorbidities, repeated and prolonged hospitalizations, malnutrition and functional limitations.
- More likely admitted to ICU than someone who is younger.
- Highest mortality in the old elderly (85+).
- Prolonged hospitalization.

Susceptibility of Nursing Home Residents to Infection

With advancing age, the immune system's ability to protect against infections may begin to decline. For instance, the protective effect generated by a vaccine on the immune system might decrease.

The presence of invasive medical devices, such as urinary catheters or central venous catheters, provides a site for pathogens to enter the body.



Comorbid conditions and chronic diseases can predispose residents to site-specific infections.

For example, chronic obstructive pulmonary disease (COPD) can predispose a resident to pneumonia.

Certain medications, such as steroids, may increase susceptibility to infection.

Communal, or shared, residence and group activities increase opportunities for the transmission of pathogens, such as influenza and norovirus.

Sepsis Chances of Survival

Anyone can get an infection, and almost any infection, including COVID-19, can lead to sepsis. In a typical year:

- At least **1.7 million** adults in America develop sepsis.
- Nearly **270,000** Americans die as a result of sepsis.
- **1 in 3** patients who dies in a hospital has sepsis.
- Sepsis, or the infection causing sepsis, starts outside of the hospital in nearly **87%** of cases.
- Worldwide, one-third of people who develop sepsis die. Many who do survive are left with life-changing effects, such as post-traumatic stress disorder (PTSD), chronic pain and fatigue, organ dysfunction (organs don't work properly) and/or amputations.

[Long-Term Care - Sepsis Alliance](#)

[Sepsis Toolkit 2021.pdf \(ihaconnect.org\)](#)

Sepsis is the leading cause of death U.S. hospitals

MORE THAN 4,400 HOOSIERS DIED FROM SEPSIS.

Indiana hospital death rate from sepsis increased from 4.6% in 2019 to 6.0% in 2020.

[*Sepsis ToolKit 2021.pdf \(ihaconnect.org\)](#)

It's about T-I-M-E!

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



TEMPERATURE
higher or lower
than normal

INFECTION
may have signs
and symptoms of
an infection

MENTAL DECLINE
confused, sleepy,
difficult to rouse

EXTREMELY ILL
severe pain,
discomfort,
shortness of breath

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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sepsis.org



How to Get Ahead of Sepsis

HOW CAN I GET AHEAD OF SEPSIS?

As a patient, you can take specific steps to reduce your risk of sepsis, including caused by COVID-19, such as:

1 | PREVENT INFECTIONS

Talk to your healthcare professional about steps you can take to prevent infections that can lead to sepsis.



Take good care of chronic conditions



Get recommended vaccines

2 | PRACTICE GOOD HYGIENE

Remember to wash your hands and keep cuts clean and covered until healed.



Wash your hands



Keep cuts clean and covered until healed

3 | KNOW THE SIGNS AND SYMPTOMS

A patient with sepsis might have one or more of the following signs or symptoms. A medical assessment by a healthcare professional is needed to confirm sepsis.



High heart rate or low blood pressure



Fever, or shivering, or feeling very cold



Confusion or disorientation



Shortness of breath



Extreme pain or discomfort



Clammy or sweaty skin

4 | ACT FAST

Sepsis is a medical emergency. **ACT FAST.**

If you or your loved one has an infection that's not getting better or is getting worse, **ACT FAST.** Get medical care **IMMEDIATELY** either in-person, or at minimum, through telehealth services. Ask your healthcare professional, "Could this infection be leading to sepsis?" and if you should go to the emergency room for medical assessment.

Hand Hygiene

Using an alcohol-based hand sanitizer:

- Put product on hands and rub hands together
- Cover all surfaces until hands feel dry
- This should take around 20 seconds

Using soap and water:

1. Wet their hands with water.
2. Apply an amount of soap recommended by the manufacturer to their hands.
3. Rub their hands together for at least 20 seconds, covering all surfaces of the hands and fingers.
4. Rinse their hands with water and dry with a disposable towel.
5. Use the towel to turn off the faucet.

[Patients | Hand Hygiene | CDC](#)



Sepsis in Long-term Care (LTC)

- Sepsis is a common cause of hospitalization in older adults.
- LTC facilities have a regulatory requirement to reduce preventable ER visits and hospitalizations due to infections.
- Clinical tools and current criteria for early identification of sepsis have low sensitivity and specificity among LTC residents.
- Early diagnosis must focus on changes in clinical, mental and functional status and vital signs, including pulse oximetry.
- Laboratory data can increase the suspicion of sepsis, but the availability of testing and timing of results limits its usefulness in LTC.
- Most LTC facilities do not have ability to manage sepsis based on current guidelines:
 - Residents with severe infections at risk for sepsis should be transferred to an acute care hospital.
- Factors contributing to sepsis development in LTC- Delayed recognition, lack of knowledge and resources, staffing shortages.

Sepsis Treatment—Long-term Care

LTC facility (LTCF) residents should be transferred to an acute-care facility when any of the following conditions exist:

- The resident is clinically unstable and the resident or family goals indicate aggressive interventions should be initiated.
- Critical diagnostic tests are not available in the LTCF.
- Necessary therapy or the mode of administering therapy (frequency or monitoring) are beyond the capacity of the LTCF.
- Comfort measures cannot be ensured in the LTCF.
- Specific infection-control measures are not available in the LTCF.

Early diagnosis must focus on changes in clinical, mental and functional status and vital signs, including pulse oximetry.

LTCFs will transfer residents with severe infections at risk of evolving into sepsis to an acute hospital setting.

[Sepsis in Older Adults in Long-Term Care Facilities: Challenges in Diagnosis and Management - PubMed \(nih.gov\)](#)

Communication/Transfer

SBAR is an easy-to-remember, concrete mechanism useful for framing any conversation, especially critical ones, requiring a clinician's immediate attention and action.

SBAR Communication Form and Progress Note

SITUATION:

Change in condition, symptoms or signs I am calling about is/are:

BACKGROUND:

Resident description This resident is in the NH for:

ASSESSMENT (RN) OR APPEARANCE (LPN):

What do you think is going on with the resident?

REQUEST: I suggest or request?

Nursing Notes: (for additional information on the Change in Condition)

[INTERACT SBAR Form.pdf](#)

This inter-facility infection control patient transfer form can assist in fostering communication during transitions of care for patients infected with MDROs, COVID-19, etc.). [Inter-Facility Infection Control Transfer Form.pdf](#), [Inter-Facility Infection Control Transfer Form for States Establishing HAI Prevention Collaboratives \(cdc.gov\)](#)

SBAR

Transfer Tool

The image shows a form titled "SBAR report to physician about a critical situation". The form is divided into four main sections: S, B, A, and R. Each section contains specific questions and checkboxes for data entry. The 'S' section covers patient identification and the problem being reported. The 'B' section covers the patient's current status, including vital signs and physical exam findings. The 'A' section is for assessment, where the reporter provides their clinical judgment. The 'R' section is for request, where the reporter states what they want the physician to do. The form includes fields for patient name, room number, and various clinical parameters like blood pressure, heart rate, and oxygen saturation.

Complications

Sepsis can last days to weeks and cause the following:

- Inflammation
- Blood clotting
- Renal failure
- Respiratory distress syndrome permanent lung damage
- Heart failure
- Permanent brain damage
- Gangrene
- Severe sepsis
- Septic shock

Untreated sepsis is fatal (DEATH).

Surviving Sepsis Campaign (SSC)

- Developed for sepsis quality improvement in 2002.
- Goals: spread sepsis awareness, improve diagnosis, increase use of appropriate and timely care, educate healthcare providers, develop guidelines and implement performance improvement programs.
- Bundles with evidence-based guidelines were created and are updated periodically.

Surviving Sepsis Campaign Recommendations

- Act quickly upon sepsis and septic shock recognition.
- Minimize time to treatment.
- Monitor closely for response to interventions.
- Communicate sepsis status in hand-offs.

Screening and Early Treatment Tools

National Early Warning Score (NEWS)

- Based on 7 clinical parameters.
- Produces aggregate score between 0 and 20.
- Scores 4 and under are low risk.
- Scores 5-6 are medium risk.
- Scores 7 or higher are high risk.

National Early Warning Score (NEWS)*

PHYSIOLOGICAL PARAMETERS	3	2	1	0	1	2	3
Respiration Rate	≤8		9 - 11	12 - 20		21 - 24	≥25
Oxygen Saturations	≤91	92 - 93	94 - 95	≥96			
Any Supplemental Oxygen		Yes		No			
Temperature	≤35.0		35.1 - 36.0	36.1 - 38.0	38.1 - 39.0	≥39.1	
Systolic BP	≤90	91 - 100	101 - 110	111 - 219			≥220
Heart Rate	≤40		41 - 50	51 - 90	91 - 110	111 - 130	≥131
Level of Consciousness				A			V, P, or U

Screening tools for the acutely ill

...Modified Early Warning System(MEWS)

- A modification of NEWS
- Adds urine output as clinical parameter but removes O2 parameters from the mix
- 75% sensitive and 83% specific for predicting which patients required transfer to a higher level of care
- Assess RR, O2 sat, HR, SBP, temperature, consciousness, and urine production

Screening and Early Treatment Tools continued...

Systemic inflammatory response syndrome (SIRS)

- Bedside tool for sepsis screening outside the ICU

qSOFA

- Not recommended
- Tool readily identifies patients at high risk for death but lacks sensitivity for the actual detection of sepsis

SIRS Criteria

Meet two or more of the followings:

- Temperature: $< 36^{\circ}\text{C}$ or $> 38^{\circ}\text{C}$
- Heart rate: > 90 beats per minute
- Respiratory rate: > 20 breaths per minute
- White blood cell count: $< 4,000$ cells per mm^3 , $> 12,000$ cells per mm^3 , or $> 10\%$ immature (band) forms

qSOFA Criteria

Meet two or more of the followings:

- Respiratory rate: ≥ 22 breaths per minute
- Altered mental status
- Systolic blood pressure: ≤ 100 mm Hg

Post Sepsis/Complications

- General to extreme weakness and fatigue
- Breathlessness
- General body pains or aches
- Difficulty moving around
- Difficulty sleeping
- Weight loss, lack of appetite, food not tasting normal
- Dry and itchy skin that may peel
- Brittle nails
- Hair loss

It is also not unusual to experience the following:

- Feel unsure of yourself
- Not care about your appearance
- Want to be alone, avoiding friends and family
- Have flashbacks, bad memories
- Be confused about what is real and what isn't
- Feel anxious, more worried than usual
- Experience poor concentration
- Be depressed, angry, unmotivated
- Feel frustration at not being able to do everyday tasks

Consult local resources if not getting better:

- **PT/OT/ST**
- **RT**
- **Mental health services**

Recovery

Set small, achievable goals each week such as taking a bath, dressing or walking up the stairs. Here are some things you can do:

- Rest and rebuild strength.
- Talk about what you are feeling with family and friends.
- Record your thoughts, struggles and milestones.
- Learn about sepsis to understand what happened.
- Ask your family to fill in any gaps you may have in your memory about what happened to you.
- Eat a balanced diet.
- Exercise if you feel up to it.
- Make a list of questions to ask your doctor when you go for a check-up.

Impact on the Elderly

- Cognitive decline
- Physical long term disabilities affecting AD
 - walking,
 - dressing,
 - bathing,
 - eating,
 - toileting,
 - getting in and out of bed.
 - Preparing hot meals,
 - Taking meds

Sepsis Survivors/Life changing challenges

Recovery takes time

sepsis survivors are not out of danger: only half will completely recover, the rest will either die within 1 year or be burdened by long-term disabilities.

may be more at risk for developing other infections both viral and bacterial.

Rehabilitation: to restore you back to your previous level of health or as close to it as possible.

Long-term effects of sepsis

- Insomnia
- Nightmares, vivid hallucinations, panic attacks
- Disabling muscle and joint pains
- Decreased mental (cognitive) function
- Loss of self-esteem and self-belief
- Organ dysfunction (kidney failure, lung problems, etc.)
- Loss of hands, arms, legs, or feet (limb amputation)



**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.

What causes sepsis?
Any type of infection that is untreated or not taken care of properly. It often involves with infection of the lungs (e.g., pneumonia), urinary tract (e.g., kidney infection), and gas. The infection moves when germs enter a person's body and multiply, causing illness and organ and tissue damage.

LIFE AFTER SEPSIS

What are the first steps to recovery?
After you've had sepsis, rehabilitation usually starts in the hospital by slowly helping you move around and test other physical abilities (standing, walking, lifting, moving around) in the hospital. The purpose of rehabilitation first helps you back to your previous level of health or as close to it as possible. Begin your rehabilitation by building up your activities slowly and rest when you need it.

How will I feel when I get home?
You have been seriously ill, and your body will need time to get better. You may experience the following physical symptoms upon returning home:

- General extreme weakness and fatigue
- Bone/joint pain
- General body pain or aches
- Difficulty moving around
- Difficulty sleeping
- Unhealthy lack of appetite, food not tasting normal
- Dry and itchy skin that may peel
- Brittle nails
- Hair loss

Many survivors are left with LIFE-CHANGING challenges

Life After Sepsis

Quiz



What is sepsis?

- A. A disease that cannot be cured
- B. The body's extreme, life-threatening response to an infection
- C. A mild, nonurgent medical condition

[Check Your Knowledge About Sepsis | CDC](#)

The correct answer is:

B. The body's extreme, life-threatening response to an infection

Sepsis is the body's extreme response to an infection. It is a life-threatening medical emergency. Sepsis happens when an infection you already have—in your skin, lungs, urinary tract or somewhere else—triggers a chain reaction throughout your body. Without timely treatment, sepsis can rapidly lead to tissue damage, organ failure and death.

Quiz



What are the signs and symptoms of sepsis?

- A. High heart rate, low blood pressure or shortness of breath
- B. Fever, shivering or feeling very cold
- C. Confusion or disorientation
- D. Extreme pain or discomfort
- E. Clammy or sweaty skin
- F. All of the above

The correct answer is:

F. All of the above

A person with sepsis might have one or more of the following signs or symptoms: confusion or disorientation; shortness of breath or high heart rate; fever, shivering or feeling very cold; extreme pain or discomfort; and clammy or sweaty skin.

Quiz



Anyone can get an infection and almost any infection can lead to sepsis. Who is at higher risk?

- A. Adults 65 or over
- B. People with weakened immune systems and people with recent severe illness or hospitalization
- C. People with chronic medical conditions, such as diabetes, lung disease, cancer and kidney disease
- D. Sepsis survivors
- E. Children younger than one
- F. All of the above

The correct answer is:

F. All of the above

Anyone can get an infection and almost any infection can lead to sepsis. Certain people are at higher risk: adults 65 or older; people with chronic medical conditions, such as diabetes, lung disease, cancer and kidney disease; people with weakened immune systems; and children younger than one.

Quiz



One in ____ patients who dies in a hospital has sepsis.

- A. 3
- B. 10
- C. 50
- D. 100

The correct answer is:

A. 3

1 in 3 patients who die in a hospital have sepsis.

Quiz



Which of these are NOT one of the ways you can Get Ahead of Sepsis?

- A. Prevent infections
- B. Practice good hand hygiene
- C. Know the signs and symptoms
- D. Wait until the sign and symptoms get worse

The correct answer is:

D. Wait until the signs and symptoms get worse

Preventing infections, practicing good hygiene, knowing the signs and symptoms and getting medical care immediately are all important to help you get ahead of sepsis. To learn more about sepsis and how to prevent infections, visit www.cdc.gov/sepsis.

[Check Your Knowledge About Sepsis | CDC](#)

References

[Sepsis | CDC](#)

[Health: Epidemiology Resource Center: Sepsis \(in.gov\)](#)

[Precautions | Isolation Precautions | Guidelines Library | Infection Control | CDC](#)

[Long-Term Care - Sepsis Alliance](#)

www.cdc.gov/sepsis/education/share.html

[Hospital Toolkit for Adult Sepsis Surveillance \(cdc.gov\)](#)

[A Back to Basics Approach to Prevent Infection | Blogs | CDC](#)

[Intensive Care Unit \(ICU\) Suite of Quick Observation Infection Prevention Tools \(cdc.gov\)](#)

[Quick Observation Tools \(QUOTs\) for Infection Prevention | CDC](#)

[Its ok to ask Poster PT1_508 \(cdc.gov\)](#)

[Speak Up Campaigns | The Joint Commission](#)

[Be like the best \(sepsisinstitute.org\)](#)

Sepsis Facts

2020 State of Indiana Facts (Indiana Hospital Association, 2021)

1. Sepsis is the most common discharge diagnosis for Indiana hospital patients who are readmitted within 30 days and the most frequent inpatient diagnosis, behind deliveries.
2. Over 4,400 hospitalized Hoosiers died from sepsis in 2020, followed by COVID-19 respiratory failure with 4,001 deaths (Datalink APR-DRG 720, Septicemia).
3. During the COVID-19 pandemic, Indiana’s hospital death rate from sepsis increased from 4.6% in 2019 to 6.0% in 2020 (APR-DRG 720, septicemia, excluding palliative care patients).
4. Sepsis originated outside the hospital for over 91% of cases in 2020 (Sepsis ICD-10 Codes).
5. In 2020 Indiana hospitals averaged 53% compliance with the sepsis bundles of care compared to 60% nationally.
6. In 2020, Indiana hospitals incurred sepsis average charges of \$61,781 per discharge, \$2.5 billion total charges and 6.53 days average length of stay (Dimensions APR DRG 720).

2020 Worldwide/National Facts (Sepsis Alliance, 2020)

1. More than 1/4 of U.S. adults have NEVER heard of sepsis and just 15% can name the symptoms.
2. Sepsis is the leading cause of death in U.S. hospitals.
3. About 6% of hospitalizations are due to sepsis, and 35% of all hospital deaths are due to sepsis.
4. Sepsis is the leading cause of readmissions, with as many as 19% hospitalized within 30 days.
5. As many as 87% of sepsis cases originate in the community and not in the hospital.
6. The risk of mortality from sepsis increases by 4-9% for every hour treatment is delayed. As many as 80% of septic shock patients can be saved with rapid diagnosis and treatment.
7. Sepsis is the most common complication observed in severe cases of COVID-19.
8. Research reports that hospitalized COVID-19 patients are 22% more likely to develop sepsis than hospitalized influenza patients and four times as likely to develop severe septic shock.
9. Sepsis takes 11 million lives around the world each year, contributing to 20% of all deaths globally and taking more lives than cancer. This is more than 20 deaths every minute. .

2020 Worldwide/National Facts (Sepsis Alliance, 2020)

10. More than 1.7 million people in the U.S. are diagnosed with sepsis each year – one every 20 seconds – and the incidents is rising.
 11. 270,000 people die from sepsis every year in the U.S. – one every 2 minutes. That’s more than from prostate cancer, breast cancer and opioid overdose combined.
 12. Each year, more than 75,000 children in the U.S. develop severe sepsis and 6,800 of these die, more than from pediatric cancers.
 13. Sepsis causes at least 261,000 maternal deaths every year worldwide and is driving increases in pregnancy-related deaths in the U.S.
 14. Sepsis in the U.S. disproportionately affects the Black community; Blacks bear nearly twice the burden of sepsis deaths, relative to the Black population, as whites.
 15. Missed infections are the third most common cause of diagnostic errors in medical malpractice cases. Sepsis is the most common condition among missed infections in diagnostic errors.
 16. Costs for sepsis hospitalization and skilled nursing are estimated to be \$62 billion annually. This is only a portion of all sepsis-related costs since many have additional costs after discharge.
 17. Sepsis is the #1 cause of readmission to the hospital, costing more than \$3.5 billion each year.
- References Indiana Hospital Association. (2021, July 27). Datalink. Retrieved from Tableau Datalink: <https://ihadatalink.org/> Sepsis Alliance. (2020, December). Sepsis Fact Sheet 2020-12-22. Retrieved from Sepsis Alliance: <https://www.sepsis.org/education/resources/fact-sheets/>

Sepsis Progression, Symptoms, Diagnostics and Treatment

Early identification and treatment of infection can prevent sepsis	Key Indicators of Infection and most likely to Progression to Sepsis	Signs and Symptoms	Labs/Diagnostics	Treatment
Infection/or Suspicious Infection	Lung (Pneumonia) Urinary Tract (UTI) Skin (cuts, wounds) Gastrointestinal Tract (GI)	Fever (sometimes the only sign of an infection). Chills and sweats. Cough, Overall appearance. Sleeping more. N, V, D. Note: Shortness of breath. change in mental status (confusion, excessive sleepiness); pain, or overall illness, would be an emergency.	Blood Tests, Urine Tests Throat Swabs, Sputum Samples, Stool Samples Spinal Tap, Imaging Scans Bacterial, Viral, Fungal Diagnostics CXR, CT, MRI, US	If you don't stop that infection, it can cause sepsis. Antibiotics Increase Assessments/ Vital signs
SIRS Systemic inflammatory response syndrome (SIRS) is an exaggerated defense response of the body to a noxious stressor (infection, trauma, surgery, acute inflammation, ischemia or reperfusion, malignancy, etc.)	<ul style="list-style-type: none"> ➤ ≥ 2 criteria ➤ Temperature > 100.4 < 96.8 F ➤ HR > 90 ➤ WBC > 12,000ul/ < 4,000ul or > 10% bands ➤ RR > 20 (PaCO2 < 32 mmHg) 	Infectious causes of SIRS Pneumonia, Wounds, Endocarditis, Cellulitis, UTIs, Toxic Shock Syndrome (TSS), Gangrene, Meningitis, Cholecystitis, etc.	WBC, CBC, Blood Urine Sputum Wound Cultures, LFT, Cardiac Enzymes, Lactic Acid, Blood Gases (ABG), CSF. Procalcitonin C-Reactive Protein (CRT),	Treatment is aimed at alleviating the cause
Sepsis SIRS with a suspected source of infection is termed sepsis .	Suspicious/Known Infection + ≥ 2 SIRS Extremely Ill How is sepsis diagnosed and treated? CDC	Shivering, fever, feeling very cold, Difficulty Breathing, Extreme pain or feeling worse than ever, Low blood pressure, Increase HR, Sleepiness, difficulty waking up, Confusion	WBC, CBC, Lactate Level repeat in 2h if > 4mmol/l (should drop by 10% or more in 1 to 2 hours if resuscitation is adequate), cortisol, UA C/S, CXR, Sputum C/S, LFT, Cardiac Enzymes,	Crystalloid Fluids 30 mL/kg Vasopressors (MAP > 65mmHg) Broad-spectrum Antibiotics Surgery
Severe Sepsis Signs of organ dysfunction.	Sepsis + Organ Dysfunction Cardiovascular: SBP < 90 or 40mmhg < from baseline, or MAP < 65, Respiratory: SAO2 < 90	Organ Dysfunction Low Blood Pressure Abnormal Heartbeat Skin color changes or patchy Difficulty breathing Extreme weakness Low or NO urine output Decrease LOC	High glucose without diabetes Lactic Acidosis	Low oxygen level High creatinine Coagulation abnormalities Low platelets, High bilirubin
Septic Shock hemodynamic instability despite intravascular volume repletion is septic shock	Sepsis + refractory hypotension After adequate fluid Or need of Vasopressors	Organ Damage High lactate in the blood Decreased capillary filling or mottling Low Blood Pressure Dangerous low B/P	Severe Organ Damage	ICU Antibiotics Be like the best (sepsisinstitute.org)

Questions?

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