



Sepsis 911

It's About T.I.M.E.™

Sepsis.org

- Introduction
- Why am I interested in sepsis?



Disclaimer



This information is intended for educational purposes only. Sepsis Alliance does not represent or guarantee that the information is applicable to any specific patient's care or treatment. The educational content does not constitute medical advice from a physician and is not to be used as a substitute for treatment or advice from a practicing physician or other healthcare provider. Sepsis Alliance recommends users consult their physician or healthcare provider regarding any questions about whether the information might apply to their individual treatment or care.

What Sepsis Is



- Greek origin, means to decay or to putrefy
- Sepsis is the body's overwhelming & life-threatening response to any infection that can lead to tissue damage, amputations, organ failure, & death.

What Sepsis is NOT:

- An infection
- “Blood poisoning”
- Contagious
- Rare



Sepsis isn't “a thing”. You can't have sepsis in one part of your body, like an infection. It is a systemic reaction, affecting your whole body.

Sepsis in the United States



- Every 2 minutes, 1 person in the U.S. dies from sepsis¹
- Sepsis is the #1 cause of death in hospitalized patients² - 1 in 3 hospital deaths
- Deaths from sepsis outnumber those from opioid overdoses, breast cancer, & prostate cancer combined^{1,2,3}
- Each year more than \$53 billion is spent on acute care in-hospital costs; making sepsis the most expensive condition in the US to treat⁴
- **Before COVID-19, there were an estimated 350,000 sepsis-related deaths per year in the US.**
- **Since severe COVID is viral sepsis, numbers will be higher for 2020 and the foreseeable future.**

1 Rhee, C., et al. JAMA. 2017; 318 (13): 1241-1249

2 Liu V., et al. JAMA. 2014; 312(1): 90-92.

3 Cancer Facts and Figures 2018, American Cancer Society. <https://www.cancer.org/research/cancer-facts-statistics/all-cancer-facts-figures/cancer-facts-figures-2018.html>

4 Overdose Death Rates, National Institute on Drug Abuse. <https://www.drugabuse.gov/related-topics/trends-statistics/overdose-death-rates>

5 Buchman et al. Crit. Care Med 2020 48(3):302-318

Older Adults & Sepsis



- More than 1.3 million adults 45+ are hospitalized with sepsis each year¹
- Adults age 65+ are **13x** more likely to be hospitalized with sepsis²
- 63% of adults (60+) admitted to the ICU present with sepsis upon admission³



1. <https://www.hcup-us.ahrq.gov/reports/statbriefs/sb122.pdf>
2. <https://www.cdc.gov/nchs/products/databriefs/db62.htm>
3. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4766385/>

Pediatric Sepsis



- Every day, more than 200 children are diagnosed with severe sepsis in the U.S. This is more than 75,000 cases in the U.S. per year.¹
- Mortality rates are high: each year, as many as 9% of children hospitalized with sepsis die in the U.S.¹
 - That is more children than are lost to childhood cancers.⁴
- More than 68% of children admitted to the hospital for sepsis have one or more chronic illnesses.⁵
- **As many as 8% of pediatric sepsis cases may be missed during emergency department visits.⁶**

1. Hartman ME, et al. *Pediatr Crit Care Med*.2013;14(7):686-693. <https://www.ncbi.nlm.nih.gov/pubmed/>
2. Cancer in Children and Adolescents. National Cancer Institute. Retrieved 3/31/20. <https://www.cancer.gov/types/childhood-cancers/child-adolescent-cancers-fact-sheet>
3. Prout AJ, et al. *J Pediatr*.2018;199:194-199. <https://www.ncbi.nlm.nih.gov/pubmed/29753542>
4. Cifra CL, et al. *Diagnosis*.2020. <https://www.ncbi.nlm.nih.gov/pubmed/32191624>

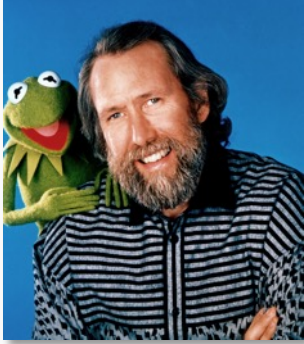
Maternal & Child Sepsis



- Maternal sepsis is estimated to complicate 10 cases per 10,000 live births in the U.S.⁴
- Analysis of delivery hospitalizations and post-partum (after birth) readmissions in the U.S. found that 23% of in-hospital deaths were related to sepsis.¹
- Black maternal patients have more than twice the risk of severe maternal sepsis as compared to their white counterparts.²
- **Sepsis in pregnancy is associated with an increased risk of preterm birth, prolonged recovery, stillbirth, and maternal death.³**

1. Hensley MK, Bauer ME, Admon LK, Prescott HC. Incidence of Maternal Sepsis and Sepsis-Related Maternal Deaths in the United States. *JAMA*. 2019;322(9):890-892. <https://jamanetwork.com/journals/jama/article-abstract/2749204>
2. Bauer ME, Bateman BT, Bauer ST, Shanks AM, Mhyre JM. Maternal sepsis mortality and morbidity during hospitalization for delivery: temporal trends and independent associations for severe sepsis. *Anesthesia & Analgesia*. 2013 Oct 1;117(4):944-50. <https://pubmed.ncbi.nlm.nih.gov/24023020/>
3. Plante LA, Pacheco LD, Louis JM. SMFM Consult Series #47: Sepsis during pregnancy and the puerperium. *Am J Obstet Gynecol*. 2019;220(4):B2-b10. [https://www.ajog.org/article/S0002-9378\(19\)30246-7/fulltext](https://www.ajog.org/article/S0002-9378(19)30246-7/fulltext)
4. Acosta CD, Knight M, Lee, HC, Kurinczuk, JJ, Gould, JB, & Lyndon, A. The continuum of maternal sepsis severity: incidence and risk factors in a population-based cohort study. *PloS one*. 2013. 8(7). <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3699572/>

Anyone Can Get Sepsis



Why This Is Important For You



- As many as 87% of sepsis cases start in the community¹
- As many as 80% of sepsis deaths could be prevented with rapid diagnosis and treatment²

1. Rhee C, et al. JAMA. 2017;318(13):1241-1249. <http://jamanetwork.com/journals/jama/fullarticle/2654187>
2. Kumar A, et al. Crit Care Med. 2006;34(6):1589-1596. <https://pubmed.ncbi.nlm.nih.gov/16625125/>

Any Infection Can Cause Sepsis



Bacterial

Examples:

- Dental abscess
- Post-surgery
- Food poisoning
- Infected cut
- Strep throat
- Cellulitis
- UTI

Viral

Examples:

- Influenza
- Viral pneumonia
- Viral meningitis
- HIV
- COVID-19

Fungal

Examples:

- Aspergillosis
- Thrush
- Vaginal yeast infection
- Athlete's foot
- Ringworm

Parasitic

Examples:

- Malaria
- Giardia

Just Like Heart Attack & Stroke:



Just like heart attack and stroke, if someone you know has an infection or is very sick with any sepsis symptoms, suspect sepsis and seek medical help right away.

Just like strokes and heart attacks, time is vital.

Sepsis is a medical emergency. Call 9-1-1 and be sure to let them know you are concerned about sepsis.

Who Is at Increased Risk?



- Adults older than 65 years of age & the very young
- People with:
 - **Weakened immune systems** such as those who:
 - Are undergoing chemotherapy or treatment with other medications that affect the immune system
 - Don't have a spleen
 - **Chronic illness** (like diabetes or COPD)
 - **Severe injuries** (such as large wounds or burns)
 - **Intellectual disabilities**

Who Is at Increased Risk? (con't)



- People of color
- Black children are 30% more likely than white children to develop sepsis after surgery¹
- People who live in lower income communities
- Hospitalized patients, those in long-term care facilities
- Sepsis survivors
- Death from sepsis among hospitalized sepsis patients at any level of severity is significantly higher for racial and ethnic minorities compared to white patients.²
 - Hospitalized Black or Hispanic sepsis patients are 7% more likely to die than white,
 - Those categorized as "Asian and Pacific Islander" or "Other" race are 18% or 21% more likely to die than white patients, respectively, after taking other patient characteristics into account.

1 Nafiu, OO, et al. Pediatrics. 2020;146(2):e20194113. <https://pediatrics.aappublications.org/content/146/2/e20194113>

2 Jones, J. M., Fingar, K. R., Miller, M. A., Coffey, R., Barrett, M., Flottemesch, T., Heslin, K. C., Gray, D. T. and Moy, E. (2017) Racial Disparities in Sepsis-Related In-Hospital Mortality: Using a Broad Case Capture Method and Multivariate Controls for Clinical and Hospital Variables, 2004-2013, Critical Care Medicine, 45(12), e1209-e1217.

Sepsis & Older Adults



- **Adults over 60 account for 70% of sepsis cases¹**

Why?

- The immune system weakens with age
- There is a higher risk of injury (falls, skin tears, etc.)
- They have more chronic illnesses
- More are in institutional living situations



1 Rhee JAMA 2017

Maternal Sepsis



- Risk factors associated with developing maternal sepsis include:
 - Not having given birth before (nulliparity)
 - Public or no health insurance
 - Other childbirth-related (obstetric) risk factors include:
 - Caesarean delivery, use of assisted reproductive technologies, and multiple births (e.g. twins or triplets).¹

Birth-giving people who are Black are also at increased risk of developing maternal sepsis.

1. Plante LA, Pacheco LD, Louis JM. SMFM Consult Series #47: Sepsis during pregnancy and the puerperium. Am J Obstet Gynecol. 2019;220(4):B2-b10. [https://www.ajog.org/article/S0002-9378\(19\)30246-7/fulltext](https://www.ajog.org/article/S0002-9378(19)30246-7/fulltext)

Progression of Sepsis



Sepsis:

- **Infection + two or more of these symptoms**
 - Temperature (higher or lower than normal)
 - Mental decline (confused, sleepy, difficult to rouse)
 - Extremely ill (severe pain, discomfort, **shortness of breath**)

Severe sepsis:

- **Infection + sepsis symptoms + organ damage**

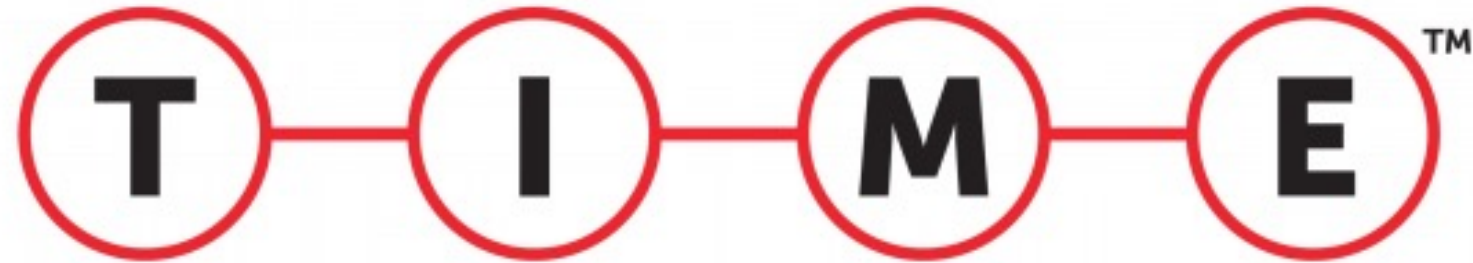
Septic Shock:

- **This is the most severe form of sepsis and is the most difficult to treat**
 - Most people with severe sepsis and everyone with septic shock will be treated in the ICU.

Sepsis: 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 Is a Medical Emergency

The logo for the Sepsis Alliance, featuring a stylized red and purple wave-like shape to the left of the text "SEPSIS ALLIANCE" in a bold, sans-serif font.

What to do:

1. Call 911
2. Tell the operator, "I think I/they have sepsis."
3. Use the word SEPSIS

When at the hospital, explain why you believe your loved one may have sepsis, such as they recently:

- Had surgery
- Were sick
- Sustained a cut or other injury that broke the skin
- Had sepsis before

Life After Sepsis



- **Most individuals fully recover!**
- However, some may experience complications such as:
 - Worsened cognitive, mental, and/or physical function
 - This can lead to limitations in activities of daily living such as: bathing, dressing, managing money¹
 - Post-traumatic stress disorder²
 - Organ dysfunction such as kidney failure
 - Amputations³

1. Iwashyna, TJ et al., JAMA Network.2010;304(16):8. <https://jamanetwork.com/journals/jama/fullarticle/186769>

2. Prescott HC and Costa DK.. Crit Care Clin.2018;34(1):175-188. [http://www.criticalcare.theclinics.com/article/S0749-0704\(17\)30078-7/abstract](http://www.criticalcare.theclinics.com/article/S0749-0704(17)30078-7/abstract)

3. Reitz, K et al. Epidemiology of Surgical Amputation After Sepsis [abstract]. American Thoracic Society 2019 International Conference, 2019 May 19-22, Dallas, TX. https://doi.org/10.1164/ajrcm-conference.2019.199.1_MeetingAbstracts.A7153

Post-Sepsis Syndrome (PSS)



- Affects up to 50% of sepsis survivors
- Effects are less obvious
- Symptoms may include:
 - Impaired cognitive functioning
 - Difficulty concentrating
 - Extreme fatigue
 - Muscle/joint pain
 - Sleep disturbance
 - Nightmares/hallucinations/flashbacks/panic attacks/PTSD
 - Loss of self-esteem



<https://www.sepsis.org/life-after-sepsis/post-sepsis-syndrome/>

Children Can Get PSS Too

- ~34% of pediatric sepsis survivors are not back to pre-sepsis functioning for at least 28 days after their hospitalization.
- 44% who had been in septic shock had cognitive difficulties compared with healthy children
- They are also more likely to have Post-traumatic Stress Disorder (PTSD) if they were treated in a pediatric ICU

1. <https://www.sepsis.org/life-after-sepsis/post-sepsis-syndrome/>

Readmissions



- Sepsis is the leading cause of hospital readmissions
- One of the risk factors for sepsis is having had sepsis before.
- Knowing what to watch for in terms of the signs and symptoms of infections and sepsis can help prevent having to go back to the hospital.



1. Finger K, Washington R. HCUP Statistical Brief #196. November 2015. Agency for Healthcare Research and Quality, Rockville, MD. <https://www.hcup-us.ahrq.gov/reports/statbriefs/sb196-Readmissions-Trends-High-Volume-Conditions.jsp>
2. Gadre SK, et al. Chest. 2019;155(3):483-490. [https://journal.chestnet.org/article/S0012-3692\(18\)32895-2/abstract](https://journal.chestnet.org/article/S0012-3692(18)32895-2/abstract)
3. Prescott H and Angus D. JAMA. 2018;319(1):91. <https://jamanetwork.com/journals/jama/fullarticle/2667724>

Can Sepsis Be Prevented?



The only way sepsis is prevented is by preventing infections.



Infection Prevention

- Vaccinations
 - Flu, COVID, pneumococcal pneumonia, etc.
- Wound Care
 - Clean scrapes & wounds, don't pop blisters
- Seek treatment for infections
- Follow recommendations from medical professionals
 - Take antibiotics/antivirals as prescribed
- Manage risk factors



Hand Hygiene

- Keep hands clean
 - Wash frequently
 - For at least 20 seconds
 - Soap & water, hand sanitizer
- Routinely clean common surfaces
- Fist or elbow bump (instead of handshake)
- Sneeze/cough into your elbow



5 Ways to Help Improve Sepsis Recovery



1. Raise public & healthcare provider awareness of the long-term consequences of sepsis
2. Patients, doctors, and families should carefully plan for hospital discharge before it happens
3. Sepsis survivors should follow up with their primary care physician after discharge
 - a) They should have a contact number of someone to call if a problem occurs before they see their own doctor
4. Undergoing rehabilitation either in a facility or at home
5. Pay attention to and watching for ANY signs and symptoms of a recurring infection.

<https://www.sepsis.org/life-after-sepsis/post-sepsis-syndrome/>

Be a Sepsis Advocate!



- Know the symptoms
- Say the word “SEPSIS”
- Express your concerns to the medical team
- Ask for clarification if you don’t understand
- Visit www.Sepsis.org for more information



Resources

- [Sepsis and Aging webpage](#)
- [Sepsis Information Guides](#)
- [Tri-fold brochures](#)
- [Sepsis Caregiver Guide](#)
- [Spanish-language resources](#)
- [Faces of Sepsis](#)

Support site with 1,500+ stories

- [Life After Sepsis video](#)

Partnered with SCCM





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