

What the experts say

The role of pneumonia and sepsis

Leading institutions in healthcare recognize sepsis as a significant challenge. Sepsis is a blood stream infection that creates a cascade of bodily responses, which can ultimately result in organ failure and/or death.¹ Sepsis is one of the leading causes of death in the United States,² with a 34.7 to 52% mortality rate in hospitals.³ Sepsis affects more than one million people a year and causes 258,000 deaths annually in the U.S.⁴ Furthermore, the treatment of sepsis costs the U.S. healthcare market \$24 billion per year, making it the number one hospitalization cost in the country.⁵ Individually, sepsis costs an average of \$20,000 - \$40,000 per hospital stay.⁶ While any infection can lead to sepsis, respiratory infections are the most common precipitating condition.⁷ Below is a summary of some of the evidence highlighting the relationship between pneumonia and sepsis.

Recommendations & guidelines

Centers for Disease Control and Prevention (CDC) 2017¹

- “Sepsis is often associated with infections of the lungs (e.g., pneumonia)...”

Association for Professionals in Infection Control and Epidemiology (APIC) 2015⁴

- “Any type of infection can lead to sepsis, but sepsis is most often associated with pneumonia...”

Mayo Clinic 2016⁸

- “While any type of infection – bacterial, viral or fungal – can lead to sepsis, the most likely varieties include: pneumonia...”

Sepsis Alliance 2017⁹

- “Sepsis and septic shock can result from an infection anywhere in the body, including pneumonia.”

Health Care Utilization Project database (AHRQ) 2017¹⁰

- Sepsis developed in 36.3% of patients with non-ventilator hospital-acquired pneumonia (NV-HAP).
- Sepsis developed in 1.9% of the Community Acquired Pneumonia patients (matched cohort).

American Hospital Association (AHA), Health Research and Educational Trust (HRET), U.S. Department of Health and Services (HEN) 2014¹¹

- “Establish and implement protocols to reduce postoperative pneumonia in patients who will receive general anesthesia.”
- “Consider a pre-operative CHG oral rinse the night before and the morning of surgery to reduce the risk of post-operative pneumonia for those who will be receiving general anesthesia.”

Published outcomes

Severe sepsis and septic shock.¹²

- “Pneumonia is the most common cause [for sepsis], accounting for about half of all cases...”

The Role of Infection and Comorbidity: Factors that Influence Disparities in Sepsis 2006⁷

- The most common type of infection causing sepsis are respiratory infections.

What the experts say

The role of pneumonia and sepsis

Published outcomes (cont.)

Implications of the new international sepsis guidelines for nursing care.¹³

- “General principles of caring for any patient undergoing mechanical ventilation continue to be relevant to patients with sepsis.”

Non-Ventilator Hospital Acquired Pneumonia Versus Pneumonia as an Admission Diagnosis in Patients Who Develop Sepsis: Incidence and Cost.¹⁰

- “Sepsis incidence associated with NV-HAP (non-ventilator associated pneumonia) was 19 times greater than that associated with AP (admitted pneumonia) (36.3% vs 1.9%). LOS was significantly longer and total hospital charges were significantly greater for patients with sepsis associated with NV-HAP (both $P < .001$). The risk of sepsis developing was 28.8 times greater with NV-HAP than with AP.”

References:

1. Sepsis. Centers for Disease Control and Prevention. <https://www.cdc.gov/sepsis/basic/qa.html>. Published April 13, 2017. Accessed August 9, 2017. 2. Kochanek KD, Murphy SL, Xu J, Tejada-Vera B. Deaths: Final Data for 2014. National Vital Statistics Reports. 2017;65(4). 3. Liu V, Escobar GJ, Greene JD, et al. Hospital Deaths in Patients with Sepsis from 2 Independent Cohorts. JAMA. <https://www.ncbi.nlm.nih.gov/pubmed/24838355>. Published July 2, 2014. Accessed August 21, 2017. 4. Three Steps toward Preventing Infections during Cancer Treatment. APIC. <https://apic.org/For-Consumers/Monthly-alerts-for-consumers/Article?id=sepsis>. Accessed July 14, 2017. 5. Torio CM, Moore BJ. National Inpatient Hospital Costs: The Most Expensive Conditions by Payer, 2013: Statistical Brief #204. Agency for Healthcare Research and Quality. <https://www.hcup-us.ahrq.gov/reports/statbriefs/sb204-Most-Expensive-Hospital-Conditions.pdf>. Accessed July 26, 2017. 6. Arefian H, Hublien S, Scherag A, et al. Hospital-related cost of sepsis: A systemic review. Journal of Infection. 2017;74(2):107-117. 7. Esper AM, Moss M, Lewis CA, Nisbet R, Mannino DM, Martin GS. The role of infection and comorbidity: Factors that influence disparities in sepsis. Crit Care Med 2006; 34:2576-82; PMID:16915108; <http://dx.doi.org/10.1097/01.CCM.0000239114.50519.0E> 8. Sepsis. Mayo Clinic. <http://www.mayoclinic.org/diseases-conditions/sepsis/symptoms-causes/dxc-20169787>. Published January 15, 2016. Accessed July 17, 2017. 9. Sepsis and Pneumonia. Sepsis Alliance. <http://www.sepsis.org/sepsis-and/pneumonia/>. Accessed July 17, 2017. 10. Giuliano, K. et al. Non-Ventilator Hospital Acquired Pneumonia Versus Pneumonia as an Admission Diagnosis in Patients Who Develop Sepsis: Incidence and Cost. Northeastern University, Boston, MA; poster presentation AACN/NTI May 2018. Boston MA. 11. Pfunter A, Wier LM, Steiner C. Costs for Hospital Stays in the United States, 2010: Statistical Brief #146. National Center for Biotechnology Information. <https://www.ncbi.nlm.nih.gov/pubmed/23447833>. Published January 2013. Accessed July 26, 2017. 12. Angus, D. C. et al. Severe sepsis and septic shock. New England Journal of Medicine (NEJM), 2013;369(9), 840-851. 13. Kleinpell R, Aitken L, Schorr C. Implications of the New International Sepsis Guidelines for Nursing Care American Journal of Critical Care. May 2013 22:212-222.