Housekeeping Reminders

Please submit questions via the Zoom chat during the presentation.

For attendance, please type in your name and organization in the chat.

Attendees are muted upon entry. Click “Unmute” when you would like to speak. Please mute yourself after speaking.

The presentations are posted on Tomorrow’s HealthCare www.tomorrowshealthcare.org

2026 HealthChoices PCMH Learning Network

June 4, 2026

PCMH Statewide Learning Session – Sepsis in Primary Care Settings

Pittsburgh Regional Health Initiative

Continuing Education Information

In support of improving patient care, this activity has been planned and implemented by the University of Pittsburgh and The Jewish Healthcare Foundation. The University of Pittsburgh is jointly accredited by the **Accreditation Council for Continuing Medical Education (ACCME)** and the **American Nurses Credentialing Center (ANCC)**, to provide continuing education for the healthcare team. **1.0 hours are approved for this course.**

As a Jointly Accredited Organization, University of Pittsburgh is approved to offer social work continuing education by the **Association of Social Work Boards (ASWB)** Approved Continuing Education (ACE) program. Organizations, not individual courses, are approved under this program. State and provincial regulatory boards have the final authority to determine whether an individual course may be accepted for continuing education credit. University of Pittsburgh maintains responsibility for this course. Social workers completing this course receive **1.0 continuing education credits**.

Disclosures

No members of the planning committee, speakers, presenters, authors, content reviewers and/or anyone else in a position to control the content of this education activity **have relevant financial relationships** with any entity producing, marketing, re-selling, or distributing health care goods or services, used on, or consumed by, patients **to disclose**.

Disclaimer

The information presented at this Center for Continuing Education in Health Sciences program **represents the views and opinions of the individual presenters**, and does not constitute the opinion or endorsement of, or promotion by, the UPMC Center for Continuing Education in the Health Sciences, UPMC / University of Pittsburgh Medical Center or Affiliates and University of Pittsburgh School of Medicine. Reasonable efforts have been taken intending for educational subject matter to be presented in a balanced, unbiased fashion and in compliance with regulatory requirements. However, each program attendee must always use his/her own personal and professional judgment when considering further application of this information, particularly as it may relate to patient diagnostic or treatment decisions including, without limitation, FDA-approved uses and any off-label uses.

Learning Objectives

- ✓ Discuss the role of risk stratification in outpatient early identification and timely treatment of sepsis
- ✓ Describe short- and long-term considerations and strategies for effective care of sepsis survivors in primary care settings
- ✓ Identify barriers to information transfer during care transitions for sepsis survivors and strategies for improvement
- ✓ Describe the use case for ICD-10 code Z51.A 'Encounter for Sepsis Aftercare

Welcome

Robert Ferguson, MPH
Chief Policy Officer
Pittsburgh Regional Health Initiative

Sepsis in Primary Care: Recognition, Care Transitions, and Survivorship

Kathryn Bowles PhD, RN, FAAN, FACMI, Professor and van Ameringen Chair in Nursing Excellence, PI of I-TRANSFER (grant # 2R01NR016014), University of Pennsylvania School of Nursing

Sepsis in Primary Care: Recognition, Care Transitions, and Survivorship

KATHRYN BOWLES, PHD, RN, FAAN, FACMI

PROFESSOR AND VAN AMERINGEN CHAIR IN NURSING EXCELLENCE

PI OF I-TRANSFER (GRANT # 2R01NR016014)

UNIVERSITY OF PENNSYLVANIA SCHOOL OF NURSING

BOWLES@NURSING.UPENN.EDU

Disclosure of Funding

- This work is supported by the National Institute of Nursing Research [NINR] grant number 2R01NR016014
- This funding source had no role in the design of this study and will not have any role during its execution, analysis, interpretation of the data, or decision to submit results.

O'Connor, M., Kennedy, E.E., Hirschman, K.B. *et al*. Improving transitions and outcomes of sepsis survivors (I-TRANSFER): a type 1 hybrid protocol. *BMC Palliat Care* **21,** 98 (2022). https://doi.org/10.1186/s12904-022-00973-w

Why Sepsis Matters for Primary Care Clinicians

Sepsis is a life-threatening organ dysfunction caused by a dysregulated host infection response and leads to high mortality.[1]

Most sepsis cases (87%) start in the community, making outpatient early recognition vital for timely intervention.[2]

Sepsis takes more lives than opioid overdose, breast cancer and prostate cancer combined.[3]

Sepsis remains the most common cause of both in-hospital death and unplanned readmission in the United States.[4]

Who Is at Risk for Developing Sepsis

Age-Related Risk

Adults over 65

Chronic Medical Conditions

Chronic illnesses impair immune defense

Immunocompromised States

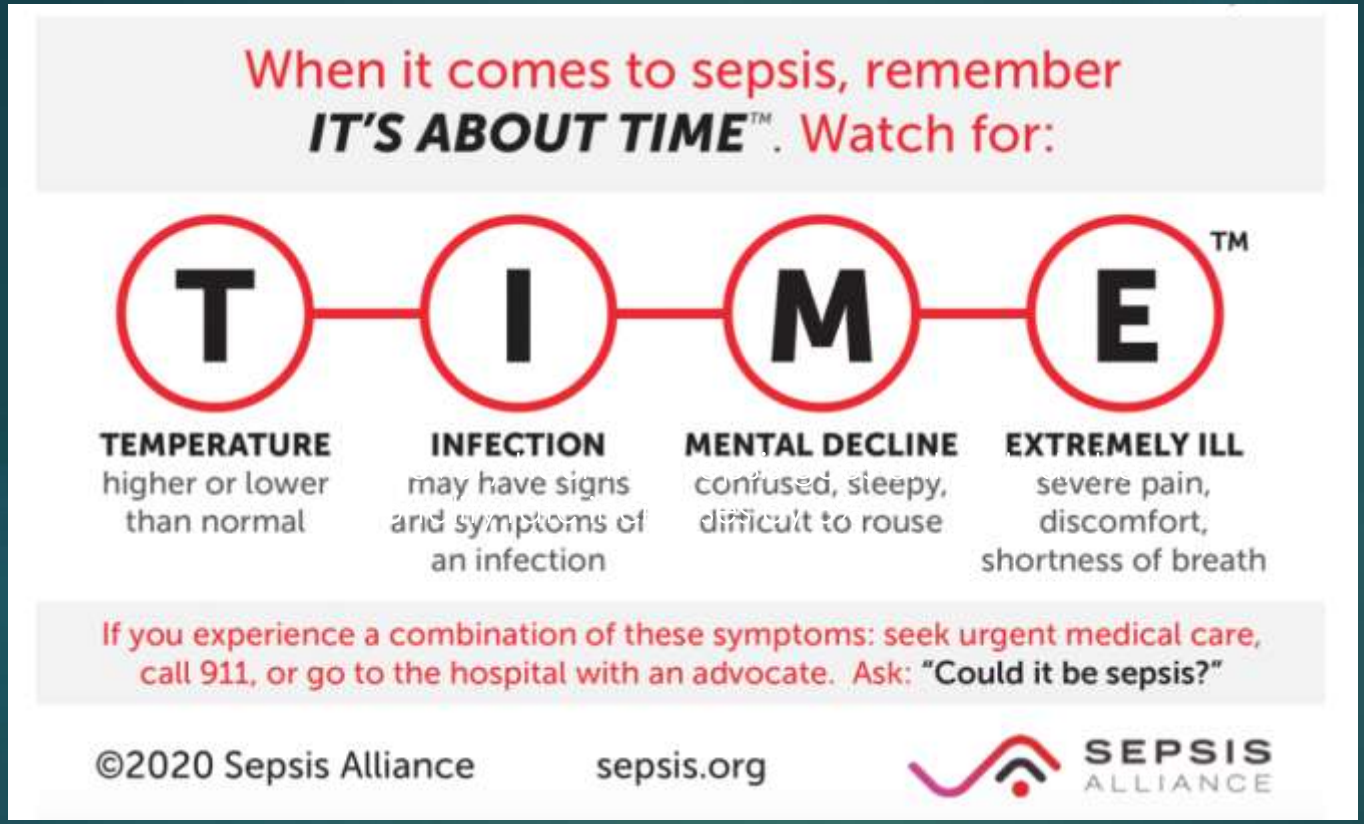
Cancer treatment, organ transplantation

Healthcare Exposure Risks

Recent hospitalization, surgery, wounds, or indwelling devices increase infection and sepsis risk in vulnerable patients.

Patient Case Vignette: Initial Presentation of Sepsis

- Patient Background and Symptoms
  - Ms. L is an 82-year-old with chronic illnesses presenting with new confusion, weakness, and worsening urinary symptoms.
- Diagnosis and Treatment
  - Diagnosed with sepsis, Ms. L received intravenous antibiotics and fluids leading to clinical improvement.
- Clinical Reasoning and Early Recognition
  - Early symptoms were subtle and nonspecific, highlighting the importance of vigilance in older adults with chronic conditions.



For every hour that sepsis with hypotension goes untreated, the mortality rate increases by 8% [5]

Care Transitions from Hospital to Home and Outpatient Follow-Up

Why the Post-Discharge Period Is High Risk

- 75% of sepsis survivors develop new functional, cognitive, or mental health issues[6,7]
- 2x as likely as non-sepsis patients to be readmitted by 30 days[8]
- Older adult sepsis survivors are at higher risk for readmission, with a median time-to readmission of 11 days[9]
- 46-52% of readmissions are due to recurring infection or sepsis[9,10,11]
- 32% of 30-day readmissions from home health care occur within the first week post-discharge[12]

Sepsis survivors require and deserve post-acute care attention

- Vulnerable Recovery Phase
  - Lingering organ dysfunction and immune challenges.
- Care Transition Challenges
  - Discharge shifts responsibility to outpatient care amid fragmented communication and patient misconceptions.
- Importance of Early Follow-Up
  - Timely outpatient follow-up and structured assessments improve outcomes and prevent complications.

Evidence that timely home health and outpatient care is effective

National study demonstrated timely home health nursing visits & outpatient follow-up within 7 days after hospital discharge significantly reduced readmissions

7 percentage point difference in 30-day readmissions (41% relative reduction) for sepsis survivors in home health care

Deb, P., Murtaugh, C., Bowles, K., Mikkelsen, M., Khajavi, H., Moore, S., Barron, Y., Feldman, P. (2019) Does Early Follow-Up Improve the Outcomes of Sepsis Survivors Discharged to Home Health Care? Medical Care, 57(8):633-640. PMID: 31295191.

VNS Health

Improving Transitions and Outcomes for Sepsis Survivors[14]

National Institute of Nursing Research 2R01NR016014

Implementation science study with five health systems (16 hospitals)
and their affiliated home health agencies to implement:

Start of home health care within 2 days of discharge;
one more HHC visit AND
an outpatient follow-up visit within one week of discharge

.

COMPONENTS OF I-TRANSFER (Improving Transitions and Outcomes of Sepsis Survivors)

ACUTE CARE

- Identify the sepsis survivor in acute care
- Refer sepsis survivor to home health care
- Notify HHC that it is a sepsis survivor
- Make the outpatient follow-up appointment
- Educate the patient and caregiver

HOME CARE

- Complete RN start of care visit within 2 days of hospital discharge
- Document sepsis on the OASIS diagnosis list
- A second HHC visit at least once more that first week
- Encourage and assist patient to attend outpatient visit

Study Design and Setting

Type I hybrid, multi-method, quasi-experimental design

Conducted across 5 healthcare systems (16 hospitals) and 5 HHC agencies in 4 states

61 interviews with 91 stakeholders, planning, then implementation for 18 months

QUAL: Thematic analysis and strategy mapping to ERIC taxonomy

QUANT: Intent to treat, difference-in-difference analysis

Outcomes

- Identification of explicit sepsis:
  - Severe sepsis and septic shock
- Timeliness of home health start of care
- Second home health visit
- Outpatient provider visit
- 30-day unplanned readmission

Barriers to Effective Care Transitions

- Challenges in Timely Follow-up
  - Scheduling constraints, insurance issues, and transportation difficulties delay critical outpatient follow-up.
- Patient Education Gaps
  - Many survivors lack adequate information on follow-up importance and warning signs requiring urgent care.
- Incomplete Documentation
  - Discharge summaries often omit key sepsis details, leaving clinicians without full illness severity context.

[15]**Bowles, KH**., Stawnychy, M., O'Connor, M., et al., (2026). Context and determinants for implementing a sepsis survivor care transition intervention reported from five health systems and home care agencies. *Frontiers in Medicine.* Volume 12 - 2025 | https://doi.org/10.3389/fmed.2025.1632083

Barriers that need continued work: Outpatient appointments

- Access to appointments is very limited
- Improved documentation of sepsis
- Need staff assigned to schedule follow-up appointments
- Geographic and social determinants affect access
- Appointments made without patient input
- Conflicting discharge info and patient education

Patient education challenges

47% of 275 confirmed sepsis survivors asked near discharge were unaware that they had sepsis

Over 25% of older adults may refuse post acute-care services[16]

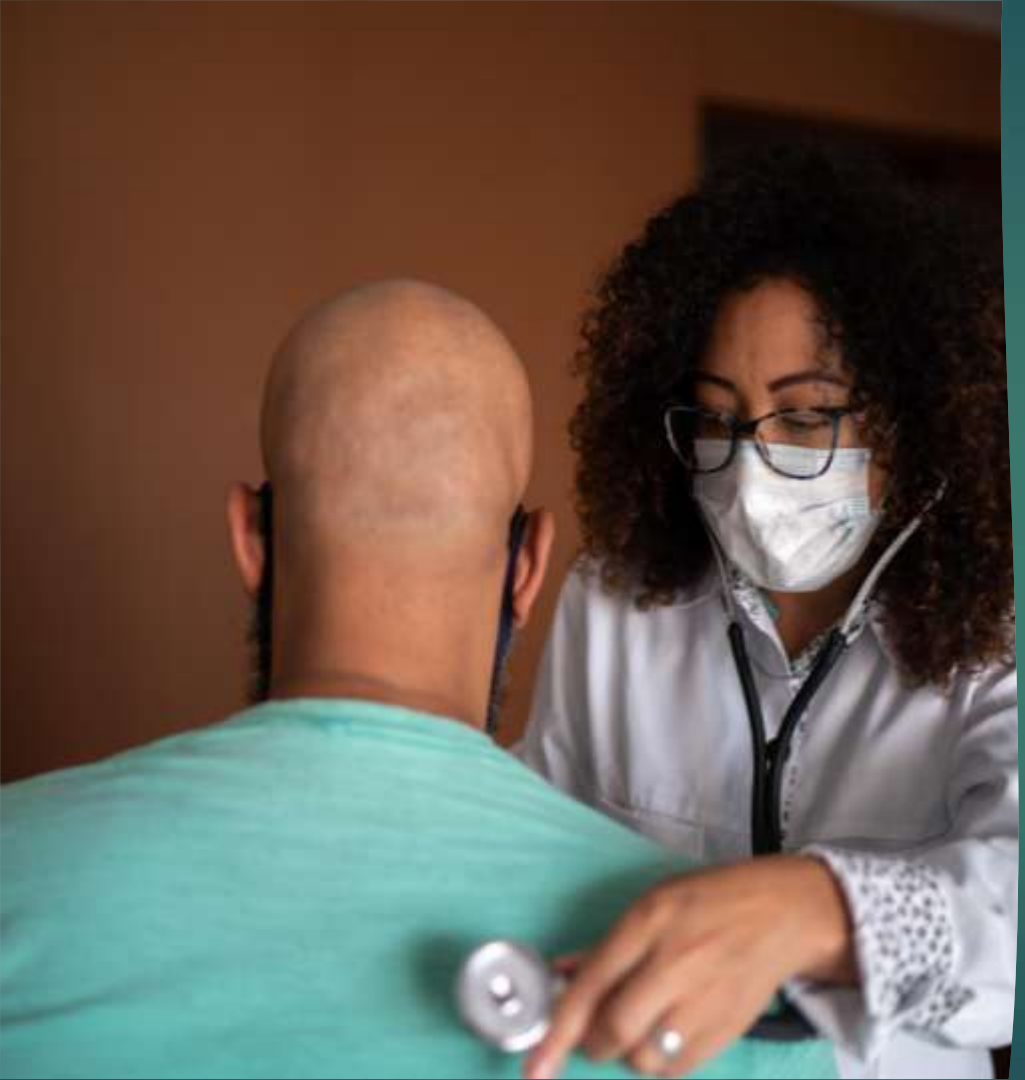
- Higher 30-day readmission (OR 2.13)

1/3 delay home health start-of-care[17,18]

- Higher 30-day readmission (OR 1.12)

1 in 10 med-surg patients miss their 1-week post DC appointment[19]

- 17% higher readmission rate compared to those who attended



Patient Education and Warning Signs After Discharge

Importance of Clear Education

Clear, repeated education helps patients and caregivers understand recovery timelines and warning signs after sepsis.

Recognizing Warning Signs

Patients should be aware of critical symptoms like confusion, shortness of breath, fever, weakness, and dizziness to seek timely care. TIME and STOP lite tool

Follow-up and Support

Scheduled follow-up visits and family involvement improve adherence and support during recovery after discharge.

Empowering Patients

Educating patients transforms them into active partners, reducing anxiety and preventing delayed treatment for complications.

Sepsis Stoplight Tool

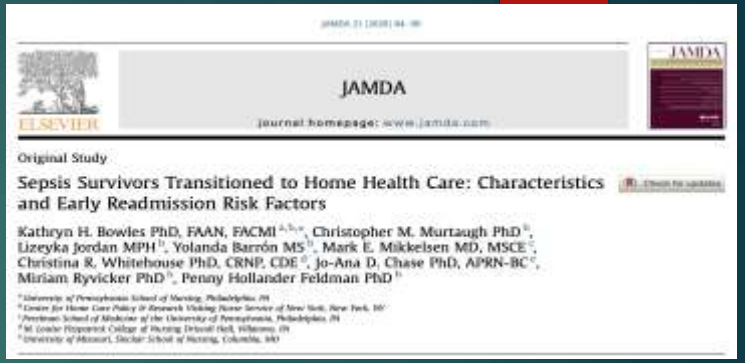
Common infections can sometimes lead to sepsis. Sepsis is a deadly response to an infection. Use the information below to keep yourself safe. If you feel like you are getting sick or have questions about sepsis, call your doctor.

Green: All Clear Zone		
	• My heartbeat and breathing feel normal for me. • I don't have chills or feel cold. • My energy level is normal. • I can think clearly. • Any wound or IV site I have is healing well.	What it means: • You have no signs of infection. • Keep following the instructions your doctor gave you.
Yellow: Warning Zone		
	• My heartbeat feels faster than usual. • My breathing is fast, or I'm coughing. • I have a fever between 100.0°F and 101.4°F. • I feel cold and am shivering; I can't get warm. • My thinking is slow; my head feels fuzzy. • I don't feel well; I'm too tired to do things. • I haven't urinated (peed) in 5 hours or it is painful when I do. • Any wound or IV site I have looks different.	What it means: • You should contact your doctor, especially if you have been sick or had surgery recently.
Red: Danger Zone		
	• I feel sick, very tired, weak, and achy. • My heartbeat or breathing is very fast. • My temperature is 101.5°F or greater. • My temperature is below 96.8°F. • My fingernails are pale or blue. • People say I'm not making sense. • My wound or IV site is painful, red, smells, or has pus.	What it means: • You need to call your doctor if you are in this zone. • **Call 911 if needed!**

“We didn’t know they had sepsis”!

- Cross sectional cohort study
- 165,228 Medicare sepsis survivors transitioned to home health care
- Sepsis was documented in the home health record in only **4%** of the cases[12]
  - The five most common primary diagnoses listed upon HHC admission
    - Pneumonia (10.2%)
    - Other aftercare (9.5%)
    - Congestive heart failure (8.4%)
    - UTI (8.4%)
    - Obstructive chronic bronchitis (6.2%)

“we can’t use an acute care sepsis code”



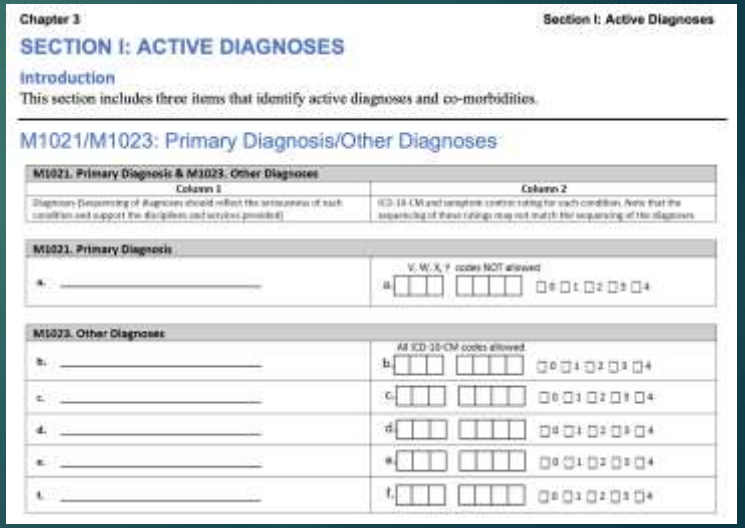
JAMDA

journal homepage: www.jamda.com

Original Study

Sepsis Survivors Transitioned to Home Health Care: Characteristics and Early Readmission Risk Factors

Kathryn H. Bowles PhD, FAAN, FACMI, Christopher M. Murtaugh PhD, Lizeyka Jordan MPH, Yolanda Barrón MS, Mark E. Mikkelsen MD, MSCE, Christina R. Whitehouse PhD, CRNP, CDE, Jo-Ana D. Chase PhD, APRN-BC, Miriam Rynicker PhD, Penny Hollander Feldman PhD



Chapter 3 — Section I: Active Diagnoses

SECTION I: ACTIVE DIAGNOSES

Introduction

This section includes three items that identify active diagnoses and co-morbidities.

M1021/M1023: Primary Diagnosis/Other Diagnoses

M1021. Primary Diagnosis & M1023. Other Diagnoses

Column 1 — Column 2

M1021. Primary Diagnosis

a. _____ — V, W, X, Y codes NOT allowed

M1023. Other Diagnoses

All ICD-10-CM codes allowed

b. _____

c. _____

d. _____

e. _____

f. _____

Current acute care codes are inadequate for sepsis survivors in post-acute care

- The existing sepsis codes

  A.41 – Other sepsis,

  R.65.20 – Severe Sepsis w/o Septic Shock

  R.65.21- Severe Sepsis w Septic Shock

- The life-threatening condition of sepsis will have been resolved by hospital discharge
- These are inappropriate in most post-acute and community-based care situations

Current post-acute codes are inadequate for sepsis survivors

Existing codes for aftercare, follow-up, history, and sequelae

Z51.8 – Encounter for other specified aftercare,

Z86.19 – Personal history of other infectious and parasitic disease,

B94.8 — Sequelae of other specified infectious and parasitic diseases.

These are not specific to sepsis

- The opportunity for classifying and warning the patients, their family members, and clinicians about sepsis-specific risks will be missed

New ICD-10 Code
Z51.A Encounter for Sepsis Aftercare[20]

Clinical Care

Improved awareness and communication among healthcare providers. Better initiation of timely care and surveillance for sepsis survivors.

Patient Education

Enhanced ability to educate patients and caregivers about risks and potential sequelae of sepsis.

Research

Facilitation of epidemiological studies and resource use analysis for sepsis survivors in post-acute care.

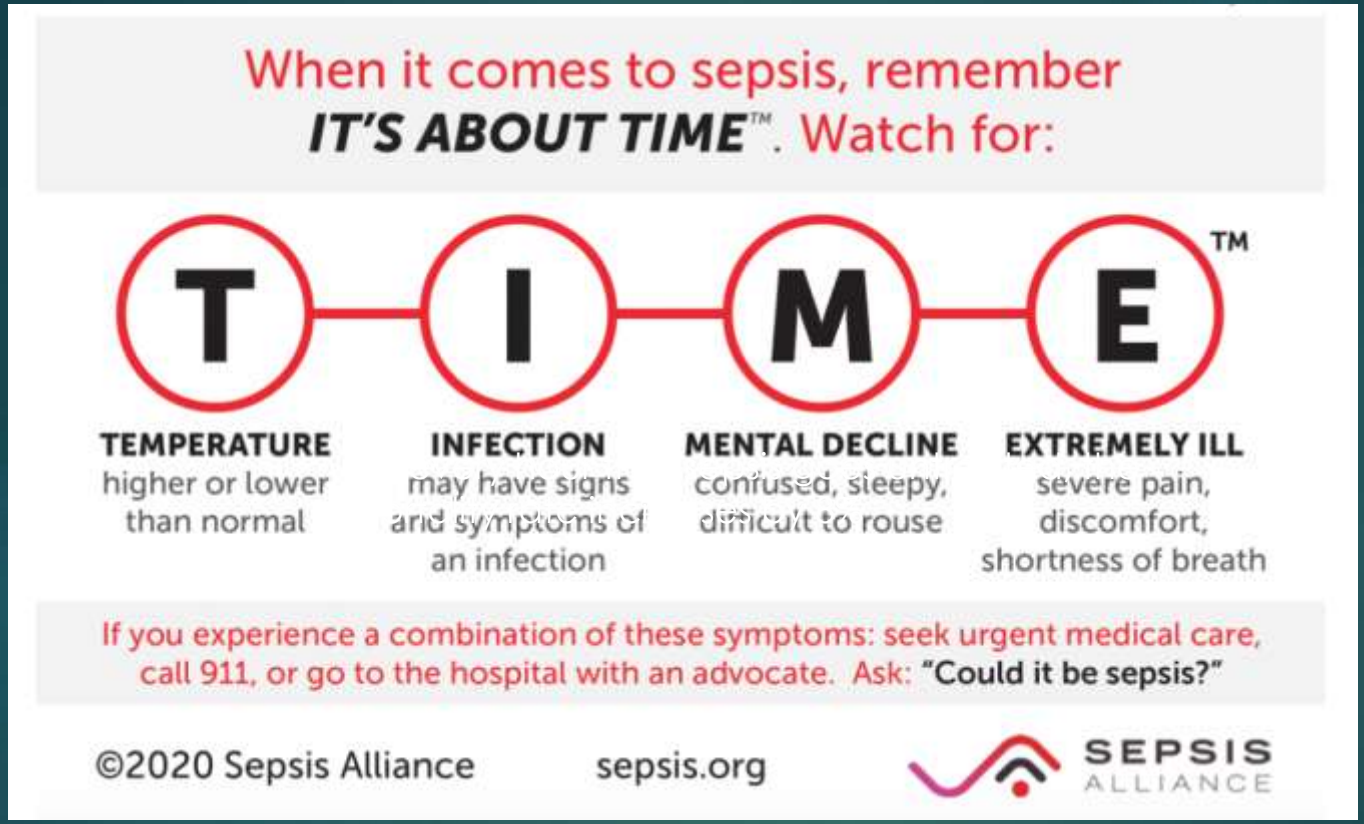
Practical Solutions for Improving Transitions of Care

- Early Follow-Up Care
  - Scheduling follow-up visits within seven days post-discharge helps identify complications early and improve patient outcomes.
- Enhanced Communication with Hospitals
  - Clear discharge summaries listing sepsis diagnosis and functional status enhance continuity of care between hospital and primary care.
- Use of Sepsis Aftercare Codes
  - Utilizing ICD-10 code Z51.A flags sepsis survivors as high-risk, facilitating care coordination and population tracking.
- Patient Education
  - Make sure patients and their caregivers are aware they had sepsis.

Primary Care Management and Key Takeaways

Structuring the First Post-Sepsis Outpatient Visit

- Comprehensive Clinical Review
  - Review infection source, hospital course, and complications like organ dysfunction or delirium during the visit.
- Vital Signs and Functional Assessment
  - Assess vital signs, volume status, and functional ability with focus on changes from patient baseline.
- Medication Reconciliation
  - Review new, discontinued, or changed medications to prevent adverse effects post-sepsis.
- Mental Health Screening and Preventive Care
  - Screen for cognitive impairment, depression, anxiety and reinforce vaccination and infection prevention.
- Document the visit using the Z51.A Encounter for Sepsis Aftercare Code
  - Formalizes the visit purpose and supports continuity



For every hour that sepsis goes untreated, the mortality rate increases by 8%[5]

Revisiting the Patient Case: Sepsis Survivorship in Practice

- Post-Sepsis Syndrome Recognition
  - Identifying persistent symptoms like fatigue and cognitive difficulties is crucial for validating patient experiences post-discharge.
- Comprehensive Patient Evaluation
  - Focused assessments reveal functional decline and cognitive impairment, guiding referrals to therapy and cognitive evaluation.
- Ongoing Management and Support
  - Proactive management including home care and therapy referrals, depression screening, education, and follow-up improves recovery outcomes.
- Primary Care's Role in Recovery
  - Primary care is key to reducing disability, supporting families, and preventing avoidable readmissions after sepsis.

Key Takeaways for Primary Care Clinicians

- Early Recognition and Escalation
  - Primary care clinicians play a vital role in early sepsis detection and timely escalation to improve patient outcomes.
- Post-Discharge Follow-up within one week
  - Timely follow-up and patient education after discharge are critical to prevent complications and support recovery.
- Managing Post-Sepsis Syndrome
  - Recognizing and addressing post-sepsis syndrome helps validate patient experiences and directs appropriate referrals.
- Structured Aftercare Tools
  - Using structured visits and ICD-10 code Z51.A supports systematic and effective sepsis aftercare management.

Sepsis Alliance:
Unite for Sepsis Symposium
June 11-12, 2026

Kellogg Conference Hotel
Capital Hill at Gallaudet University, Washington DC.

HTTPS://WWW.SEPSIS.ORG/UNITE-FOR-SEPSIS-SYMPOSIUM/

Reference

S

[1]Singer M, Deutschman CS, Seymour CW, et al. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3).JAMA. 2016;315 (8):801-810. doi:10.1001/jama.2016.0287

[2] Rudd K, Randolph A, Angus D et al. Preventing, identifying, and managing sepsis in the community: research and clinical priorities. The Lancet Primary Care, 2025; 1. 23916

[3]https://www.sepsis.org/news/2019-sepsis-awareness-survey

[4] Angus DC, Bindman AB. Achieving Diagnostic Excellence for Sepsis. JAMA. 2022;327(2):117–118. doi:10.1001/jama.2021.23916

[5]Kumar A, Roberts D, Wood KE, Light B, Parrillo JE, Sharma S, Suppes R, Feinstein D, Zanotti S, Taiberg L, Gurka D, Kumar A, Cheang M. Duration of hypotension before initiation of effective antimicrobial therapy is the critical determinant of survival in human septic shock. Crit Care Med. 2006 Jun;34(6):1589-96. doi: 10.1097/01.CCM.0000217961.75225.E9. PMID: 16625125.

[6] Prescott HC, Angus DC. Enhancing Recovery from Sepsis: A Review. JAMA. 2018;319(1):62–75.

[7] Shankar-Hari M, et al. Rate and Risk Factors for Rehospitalization in Sepsis Survivors: Systematic Review and Meta-analysis. Intensive Care Medicine. 2020;46:619–636.

[8] Mayr BF, Talisa BV, Balakumar V, Chang HC-C, Fine M, Yende S. Proportion and cost of unplanned 30-day readmissions after sepsis compared with other medical conditions. JAMA. (2017) 317:530. doi: 10

[9] Gadre SK, Shah M, Mireles-Cabodevila E, Patel B, Duggal A. Epidemiology and Predictors of 30-Day Readmission in Patients With Sepsis. CHEST. 2019;155(3):483-490..1001/jama.2016.20468

[10] Van Der Slikke EC, An AY, Hancock REW, Bouma HR. Exploring the Pathophysiology of Post-Sepsis Syndrome to Identify Therapeutic Opportunities. EBioMedicine. 2020;61:103044. doi:10.1016/j.ebiom.2020.103044

References

[11] K. Ackermann, I. Lynch, N. Aryal, J. Westbrook and L. Li. Hospital readmissions after sepsis: A systematic review of readmission reasons and meta-analysis of readmission rates. Journal of Critical Care 2025 Vol. 85 Pages 154925. DOI: https://doi.org/10.1016/j.jcrc.2024.154925

[12] Bowles KH, et al. Sepsis Survivors Transitioned to Home Health Care: Characteristics and Early Readmission Risk Factors. Journal of the American Medical Directors Association. 2020;21(1):84–90.e2.

[13] Deb, P., Murtaugh, C., Bowles, K., Mikkelsen, M., Khajavi, H., Moore, S., Barron, Y., Feldman, P. (2019) Does Early Follow-Up Improve the Outcomes of Sepsis Survivors Discharged to Home Health Care? Medical Care, 57(8):633-640. PMID: 31295191.

[14] O'Connor, M., Kennedy, E.E., Hirschman, K.B. et al. Improving transitions and outcomes of sepsis survivors (I-TRANSFER): a type 1 hybrid protocol. BMC Palliat Care 21, 98 (2022). https://doi.org/10.1186/s12904-022-00973-w

[15]Bowles, KH., Stawnychy, M., O'Connor, M., et al., (2026). Context and determinants for implementing a sepsis survivor care transition intervention reported from five health systems and home care agencies. Frontiers in Medicine. Volume 12 - 2025 | https://doi.org/10.3389/fmed.2025.1632083

[16] Topaz, M., Kang, Y., Holland, D., Ohta, B., Rickard, K., & Bowles, K.H. (2015). Higher 30 day and 60 day readmissions among patients who refuse post-acute care services. American Journal of Managed Care, 21(6), 424-433. PMID: 26168063

[17] Topaz, M., Barron, Y., Song, J., Onorato, N., Sockolow, P., Zolnoori, M., Cato, K., Sridharan, S., Bowles, K., McDonald, M. (2022). Risk of rehospitalization or emergency department visit is significantly higher for patients who receive their first home healthcare nursing visit later than two days after hospital discharge. JAMDA. 23(10): 1642-1647.

[18] Zolnoori, M., Song, J., McDonald, M., Barron, Y., Cato, K., Sockolow, P., Sridharan, S., Onorato, N., Bowles, K., Topaz, M. (2021). Exploring Reasons for Delayed Start-of-Care Nursing Visits in Home Health Care: Algorithm Development and Data Science Study. Journal of Medical Internet Research. PMID: 34967749. DOI: 10.2196/31038.

[19] Coppa, K., Kim, E. J., Oppenheim, M. I., Bock, K. R., Conigliaro, J., & Hirsch, J. S. (2021). Examination of Post-discharge Follow-up Appointment Status and 30-Day Readmission. Journal of General Internal Medicine, 36(5), 1214-1221. https://doi.org/10.1007/s11606-020-06569-5

[20] Oh S, Mikkelsen ME, O'Connor M, Bowles KH. (2022). Why Sepsis Survivors Need An ICD-10 Code for 'Sepsis Aftercare'. CHEST. 162(5):979-981. PMID: 36344131 DOI: 10.1016/j.chest.2022.06.011

Thank you!

Kathy Bowles PhD, RN, FAAN, FACMI
Professor and van Ameringen Chair in Nursing Excellence
University of Pennsylvania School of Nursing
Vice President and Director of the Center for Home Care Policy & Research
VNS Health

bowles@nursing.upenn.edu

Discussion

Next Steps, Wrap Up & Session Evaluation

Robert Ferguson

Pittsburgh Regional Health Initiative

PCMH Online Community

https://www.tomorrowshealthcare.org/

Members of your PCMH's multi-disciplinary learning team will receive log-ins

- Access the session materials in "Learning Sessions"
- Look for guides and tools in "Resources"
- Find session dates and registration links under "Events"

Supplemental Sessions

HIV Screening, Prevention, and Treatment
July 9, 2026
5:00 pm – 6:00 pm

Oral Cancer Prevention and Early Detection
September 24, 2026
5:00 pm – 6:00 pm

CEU Process

You will receive a follow up email with links to

Complete the survey at: https://www.surveymonkey.com/r/ZX3J6Y3 by Thursday, June 11th

1. Please be sure to designate which CEU credits you are requesting **CME, CNE, Social Worker or Certificate of Attendance**. If you already have an account with the UPMC Center for Continuing Education, please be sure the email you enter on the survey matches the UPMC CCE account email that you create.
2. The UPMC Center for Continuing Education will follow up with you via email after June 11th with instructions on how to claim your credits.
   - ❑ To prepare, we recommend you create an account with UPMC CCE via this website https://cce.upmc.com.
   - ❑ Please plan to check your UPMC CCE account 2 weeks post-session to confirm credits have been received

Thank You!