

SUPPLEMENTAL MATERIALS for

Best Practices for Optimizing Recovery from Sepsis; results of an expert panel

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Supplemental table 1: Members for the OVeR-Sepsis Expert Panel			
Name	Position	Organization	Relevant expertise
Kathleen Akgun, MD, MS	Pulmonary/Critical Care Physician, Associate Professor of Medicine	VA Connecticut Healthcare System, Yale School of Medicine	Critical care
Mel Anderson, MD	National Program Director, VHA Hospital Medicine, Professor	Rocky Mountain Regional VA Medical Ctr, Univ. of Colorado School of Medicine	Hospital medicine
Gary Bourdeau	Patient Representative	Veterans Research Engagement Council	Lay member
Reena Duseja, MD	Senior Advisor	VHA Office of Quality and Patient Safety	Patient safety and quality
Tammy Eaton, PhD, RN	Research Assistant Professor, Hospital Medicine	University of Michigan	Nursing ; Recovery after critical illness and sepsis
Jason Falvey, PT, DPT, PhD	Associate Professor	University of Maryland School of Medicine	Physical therapy
David Ganz, MD, PhD	Geriatrician, Health Services Researcher	Greater Los Angeles VA, UCLA, and RAND	Hospital Medicine Geriatrics
Stuart Jacobson	Patient Representative	Veterans Research Engagement Council	Lay member
Andrea Lambert, MD	Chief of Primary Care	Atlanta VA Medical Center	Primary care
Kirstin Manges Piazza, PhD, MSHP	Nurse scientist; CHERP Core Investigator	Pittsburgh VA Medical Center	Inpatient and outpatient nursing
Jo McPeake, PhD	Professor of Nursing	The Healthcare Improvement Studies (THIS) Institute, Univ. of Cambridge	Inpatient and outpatient nursing Recovery after critical illness and sepsis
Stephanie Parks Taylor, MD, MS	Chief, Division of Hospital Medicine; Professor, Internal Medicine	University of Michigan	Hospital medicine Recovery after critical illness and sepsis
Scott Pawlikowski, MD	Primary Care Improvement & Innovation Director	VHA Office of Primary Care (11PC)	Primary care
Gianna Rose	Patient Representative	Veterans Research Engagement Council	Lay member
Sheila Sullivan, PhD, RN, EBP-C	Director of Research, Evidence-Based Practice (EBP), & Analytics	VACO Office of Nursing Services	Inpatient and outpatient nursing

Supplemental Table 2: Incorporation of practices into other relevant guidelines and trials			
Domain		Practice (Panel Assessment)	Incorporation into other relevant guidelines and trials to improve sepsis recovery
Care coordination	1	Scheduling recommended specialty care and follow-up testing prior to discharge.	Scheduling of recommended specialty care and follow-up testing prior to hospital discharge is recommended by AHRQ's Project Re-Engineered Discharge (RED). ¹ A 2026 trial testing remote monitoring after hospitalization for sepsis included RED components—including ensuring that follow-up appointments were scheduled—as part of usual care. ²
	2	Outpatient follow-up to occur within 2 weeks of discharge.	AHRQ Project RED suggest that primary care follow-up after hospital discharge should occur “preferably within the first week and no later than 2 weeks after discharge”. ³ Medicare billing for transitional care services requires a face-to-face visit within 7-to-14 days of discharge. The 2021 Surviving Sepsis Campaign (SSC) Guidelines included a statement of insufficient evidence to make a recommendation regarding of timing of follow-up after sepsis hospitalization; ⁴ this question was not readdressed in the 2026 guidelines based on panel assessment that sufficient new evidence to change the prior statement was unlikely. ⁵
	3	In-person outpatient follow-up to occur within 2 weeks of discharge.	AHRQ Project RED does not specify whether follow-up should occur in-person. Medicare billing for transitional care services requires a face-to-face visit within 7-to-14 days of discharge.
Screening for new or worsened symptoms	4	Screening for limitations in basic and instrumental activities of daily living (I/ADLs) and need for durable medical equipment (DME)	Project RED recommends “collaborating with the patient's case manager to ensure that durable medical needs are identified and equipment is obtained”. ³ The 2021 and 2026 SSC Guidelines recommend assessing for physical problems after discharge. ^{4,5} One of four consensus-based statements for assessing post-intensive care syndrome specifically recommends assessing for ADL limitations. ⁶ The Centers for Disease Control and Prevention's (CDC) Hospital Sepsis Program Core Elements guidance recommends screening for I/ADL limitations prior discharge from hospitalization for sepsis. ⁷
	5	Screening for cognitive impairment	All four consensus-based statements for assessing post-intensive care syndrome specifically recommends screening for cognitive impairment, though suggested screening tools differ. ⁶ The 2026 SSC Guidelines have a good practice statement that “Health systems should facilitate assessment and following for cognitive problems after hospital discharge for sepsis or septic shock”. ⁵ Our panel assessment differs from these other recommendations, potentially reflecting the panel composition including more outpatient clinicians and the explicit instruction to consider downstream work when rating resource-intensity. Panelists noted that screening would not necessarily lead to improved management, could have unintended harms, and took time away from other important work.
	6	Screening for anxiety/depression	All four consensus-based statements for assessing post-intensive care syndrome specifically recommends screening for cognitive impairment, though suggested screening tools differ. ⁶ The 2026 SSC Guidelines have a good practice statement that “Health systems should facilitate assessment and following for emotional problems after hospital discharge for sepsis or septic shock”. ⁵ The IMPACTS trial testing a Sepsis Transition and Recovery program included mental health screening prior to hospital discharge. ⁸ Our panel assessment differs from these other recommendations, potentially reflecting the panel composition including more outpatient clinicians. Panelists noted that screening for mental health problems is already recommended annually, and it was unclear that sepsis hospitalization should trigger additional screening.

	7	Screening for post-traumatic stress disorder (PTSD)	All four consensus-based statements for assessing post-intensive care syndrome specifically recommends screening for cognitive impairment, though suggested screening tools differ. ⁶ The 2026 SSC Guidelines have a good practice statement that “Health systems should facilitate assessment and following for emotional problems after hospital discharge for sepsis or septic shock”. ⁵ Our panel assessment differs from these other recommendations, potentially reflecting the panel composition including more outpatient clinicians. Panelists noted that screening for mental health problems is already recommended annually, and it was unclear that sepsis hospitalization should trigger additional screening.
Anticipatory guidance and education	8	Educating patients on signs and symptoms of sepsis, and when to seek re-evaluation	Project RED recommends education patients on their diagnosis and using the teach-back technique to ensure understanding. ¹ The 2026 SSC guidelines suggest offering written and verbal sepsis education (on diagnosis, treatment, post-ICU/post-sepsis syndrome) prior to hospital discharge and in the follow-up setting. ⁵ The CDC Hospital Sepsis Program Core Elements guidance likewise recommends providing written and verbal education on sepsis to patients, families, and/or caregivers prior to hospital discharge. ⁷ The ENCOMPASS trial testing a Sepsis Transition and Recovery program including infection-specific education to patients and family/caregivers, including what to expect during the transition from hospital. ⁸
	9	Educating patients on common symptoms after sepsis (e.g., fatigue, shortness of breath, brain fog)	The 2026 SSC guidelines suggest offering written and verbal sepsis education (on diagnosis, treatment, post-ICU/post-sepsis syndrome) prior to hospital discharge and in the follow-up setting. ⁵ The IMPACTS trial testing a Sepsis Transition and Recovery program including infection-specific education to patients and family/caregivers, including what to expect during the transition from hospital. ⁸
	10	Counseling patients on when to return to normal activities (e.g., work, driving, graded activity, exercise)	Counseling on return to normal activity is not addressed in Project RED, SSC Guidelines, CDC Hospital Sepsis Program Core Elements, or consensus statement on assessing for post-intensive care syndrome.
Physical Rehabilitation and Adaptation	11	Physical therapy evaluation prior to hospital discharge.	The 2026 SSC guidelines suggest that health systems should facilitate assessment and follow-up for physical problems after hospital discharge for sepsis or septic shock. ⁵ The ENCOMPASS trial included confirmation that physical and/or occupational therapy assessment was ordered or completed. ⁸
	12	Assess if patient needs referral to speech language pathology (SLP)	Sepsis has been identified as a risk factor for swallowing dysfunction. ⁹ Several expert reviews recommend performing a water swallow test (e.g., Yale Swallow Protocol ^{10,11}) following extubation and referring patients who fail the water swallow test for further evaluation by SLP. ^{12,13} Dysphagia or swallow function are not explicitly addressed in Project RED, consensus statement on screening for post-ICU syndrome, the SSC guidelines, or IMPACTS trial.
Social Support	13	Screen for social needs (e.g., homelessness, food insecurity)	Project RED recommends assessing social support available at home and providing names and contact information for social support persons. ³ The 2026 SSC Guidelines include a good practice statement that hospitals and health systems should screen patients with sepsis or septic shock for economic or social support needs (including housing, nutritional, financial, and spiritual support) and make referrals where available to meet these needs. ⁵ The CDC Hospital Sepsis Program Core Elements likewise recommend screening for social vulnerability and referring to available resources. ⁷

Medication Management	14	Physician or pharmacist review and adjustment of inpatient and outpatient medications before discharge.	The 2026 SSC Guidelines include good practice statements that comprehensive medication reconciliation should be performed at transitions in care (including ICU and hospital discharge) and suggest comprehensive medication reconciliation using a pharmacist-based approach. ⁵ The ENCOMPASS trial confirmed inpatient pharmacist review of high-risk medications; appropriate prescription of medications for chronic heart and lung disease; and dose-adjustment for new/worsened renal failure. ⁸
	15	Counseling the patient and/or caregiver regarding the medication list and indications before discharge	Project RED recommends reviewing all medicine lists with the patient, including the inpatient list, outpatient list, and outpatient pharmacy list; explaining which medications to take; and reviewing each medicine's purpose. ¹
Emotional Support	16	Referring patients with critical illness to peer support programs.	The 2021 Surviving Sepsis Campaign Guidelines suggest referral that adult survivors of sepsis or septic shock and their families be referred peer support programs (conditional recommendation; very low certainty evidence). ⁴ This recommendation was based on observational studies examining the impact of varied models of peer support programs on patients after critical illness (i.e., not specific to sepsis). These studies suggest that peer support programs may reduce psychological morbidity, improve social support, and improve self-efficacy.
Goals of Care	17a	Formally readdressing goals of care before discharge (ICU).	The 2026 SSC guidelines include a good practice statement to discuss goals of care and prognosis with families. However, there was insufficient evidence to issue a recommendation on the systematic establishment of advance care directives prior to hospital discharge. ⁵ The ENCOMPASS trial included reassessment of shared decision making around goals of care at ~10 days post-discharge. ⁸
	17b	Formally readdressing goals of care before discharge (Not ICU).	The 2026 SSC guidelines include a good practice statement to discuss goals of care and prognosis with families. However, there was insufficient evidence to issue a recommendation on the systematic establishment of advance care directives prior to hospital discharge. ⁵ The ENCOMPASS trial included reassessment of shared decision making around goals of care at ~10 days post-discharge. ⁸
Monitoring	18	Calling patients within 3 calendar days after discharge to assess for new/worsened symptoms and answer any questions related to their hospitalization	Project RED recommends calling patients within 3 days of discharge to re-enforce the discharge plan and help with problem solving. ¹ The ENCOMPASS trial included multiple post-discharge calls, at <48 hours, 72-96 hours, and 7-10 days post-discharge. ⁸ The CDC Hospital Sepsis Program Core Elements recommend contacting patients within two days of discharge to follow-up on discharge instructions, symptoms, and/or issues. ⁷
Practices rated as valid (median score 7-9) and moderately resource-intensive (median score 4-6) are shown in green; practices rated as valid (median score 7-9) and highly resource-intensive (median score 7-9) are shown in blue. Practices rated as having uncertain validity are shown in grey.			

Supplemental Table 3: Round 1 and Round 2 gradings of practices to enhance recovery from sepsis

Meeting No.			Round 1 Gradings, median (IQR)			Round 2 Gradings, median (IQR)		
Care Coordination			Validity	Importance	Resource intensity	Validity	Importance	Resource intensity
1	1	Scheduling recommended specialty care and follow-up testing prior to discharge.	7.5 (5.75-8.25)	7 (7-9)	5 (4-7)	7 (6-8)	7 (6-8)	6 (5-7)
1	2	Outpatient follow-up to occur within 2 weeks of discharge.	7 (5-8)	7 (6-9)	7 (7-8)	5 (4.5-6)	6 (4-7)	7 (6-8)
1	3	In-person outpatient follow-up to occur within 2 weeks of discharge	4 (3-6)	4 (3-6)	8 (7-8)	4 (3-6)	4 (3-5)	8 (7-8)
Screening for new or worsened symptoms								
1	4	Screening for limitations in basic and instrumental activities of daily living (I/ADLs) and need for durable medical equipment (DME)	8 (8-9)	8 (7-9)	6 (4-7)	8 (8-8)	9 (7-9)	5 (5-7)
1	5	Screening for cognitive impairment	7.5 (6-8)	8 (7-9)	6 (5-8)	6 (3-7)	7 (4-8)	7 (5-8)
1	6	Screening for anxiety/depression	7 (5-9)	8 (4-9)	7 (6-8)	5 (4-7)	6 (4.75-7)	7 (5-7)
1	7	Screening for post-traumatic stress disorder (PTSD)	6 (5-9)	7 (6-9)	7 (6-8)	4 (3-6)	4 (4-6)	7 (5-7)
Anticipatory Guidance and Education Practices								
2	8	Educating patients on signs and symptoms of sepsis, and when to seek re-evaluation	8 (7.75-9)	8 (7.75-9)	5 (4.5-5.25)	8 (7-9)	8 (8-8)	4.5 (4-5)
2	9	Educating patients on common symptoms after sepsis (e.g., fatigue, shortness of breath, brain fog)	8 (6.75-9)	8 (7-9)	5 (4.5-6)	8 (8-8)	8 (8-9)	5 (4-5)
2	10	Counseling patients on when to return to normal activities (e.g., work, driving, graded activity, exercise)	8 (6-9)	8 (7-9)	5 (4-7)	6 (5-8)	7.5 (6.75-8)	6 (4.5-7)
Physical Rehabilitation and Adaptation								
2	11	Physical therapy evaluation prior to hospital discharge.	8 (6.75-8.25)	8 (6.75-9)	7 (7-7.25)	8 (7.5-8)	8 (7-9)	7 (6-8)
2	12	Assess if patient needs referral to speech language pathology (SLP)	6.5 (5-7)	7 (5-7)	7 (6-8.25)	6 (5.5-7)	7 (6-7)	6 (5.5-7)
Social Support								
2	13	Screen for social needs (e.g., homelessness, food insecurity)	8.5 (7-9)	9 (8.75-9)	7 (4.25-8)	9 (8.5-9)	9 (8-9)	7 (5-8)
Medication Management								
3	14	Physician or pharmacist review and adjustment of inpatient and outpatient medications before discharge.	9 (8-9)	9 (8-9)	7 (5-7)	9 (8.25-9)	9 (9-9)	7 (6-7)
3	15	Counseling the patient and/or caregiver regarding the medication list and indications before discharge	9 (7-9)	9 (7-9)	7 (5-7)	8 (8-9)	9 (8-9)	6 (6-7)

Emotional support								
3	16	Referring patients with critical illness to peer support programs	7 (5-8)	7 (5-8)	6 (6-7)	5 (4.25-6)	5.5 (4.25-6.75)	7.5 (7-8)
Palliation								
3	17	Formally readdressing goals of care before discharge (All).	7 (7-9)	7 (7-9)	7 (7-7)	NA	NA	NA
3	17a	Formally readdressing goals of care before discharge (ICU).	N/A	N/A	N/A	7 (6.25-7)	7 (6.25-8.5)	7 (6-7.75)
3	17b	Formally readdressing goals of care before discharge (Not ICU).	N/A	N/A	N/A	6.5 (5-7)	6.5 (5-8)	7 (6.25-7)
Monitoring								
3	18	Calling patients within 3 calendar days after discharge to assess for new/worsened symptoms and answer any questions related to their hospitalization	6 (5-8)	7 (5-8)	7 (6-8)	7 (5-7)	7 (5-8)	7 (6-7)

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Appendix 1

OVeR-Sepsis Expert Panel Booklet

First Panel Meeting
January 29, 2025

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Purpose

The goal of the Optimizing Veteran Recovery from Sepsis (OVeR-Sepsis) IIR is the identify and prioritize best practices for sepsis recovery.

We will consider select care practices within the following domains:

- Care Coordination ([Meeting 1](#))
- Medication management
- Screening for new symptoms or limitations ([Meeting 1](#))
- Anticipatory guidance and education
- Physical recovery and adaptation
- Emotional support
- Social Support
- Care Alignment

Rating Criteria

Domain	Rating	Considerations
Validity	1= not valid 9 = valid	• Is there adequate scientific evidence or professional consensus to support the practice? • Are there identifiable health benefits to patients who receive the care practice?
Importance	1=not important 9=important	• What is the degree of importance of the practice in supporting recovery? • What is the magnitude of benefit?
Resource-Intensity	1=minimal resources needed 9=maximal resources needed	• How resource-intensive, in terms of expense and staff time, is it to provide the care practice to all patients discharged from hospitalization for sepsis?

Study Team Members and Contact Information

Name / Contact	Position	Organization
Hallie Prescott, MD, MSc hprescot@med.umich.edu	Pulmonary/Critical Care Physician, Associate Professor of Medicine	Ann Arbor VA CCMR University of Michigan
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Expert Panel Members

Name	Position	Organization
Kathleen Akgun, MD, MS	Pulmonary/Critical Care Physician, Associate Professor of Medicine	VA Connecticut Healthcare System, Yale School of Medicine
Mel Anderson, MD	National Program Director, VHA Hospital Medicine, Professor	Rocky Mountain Regional VA Medical Ctr, Univ. of Colorado School of Medicine
Gary Bourdeau	Patient Representative	Veterans Research Engagement Council (VREC)
Reena Duseja, MD	Senior Advisor	VHA Office of Quality and Patient Safety
Tammy Eaton, PhD, RN	Research Assistant Professor, Hospital Medicine	University of Michigan
Jason Falvey, PT, DPT, PhD	Assistant Professor	University of Maryland School of Medicine
David Ganz, MD, PhD	Geriatrician, Health Services Researcher	Los Angeles VA, UCLA, and RAND
Stuart Jacobson	Patient Representative	Veterans Research Engagement Council (VREC)
Jennifer Koget, MS, LCSW, BCD	National Director of Social Work	VHA Social Work
Andrea Lambert, MD	Chief of Primary Care	Atlanta VA Medical Center
Kirstin Manges, PhD, MSHP	Nurse scientist; CHERP Core Investigator	Philadelphia VA Medical Center
Jo McPeake, PhD	Professor of Nursing	The Healthcare Improvement Studies (THIS) Institute, Univ. of Cambridge
Stephanie Parks Taylor, MD, MS	Chief, Division of Hospital Medicine; Professor, Internal Medicine	University of Michigan
Scott Pawlikowski, MD	Primary Care Improvement & Innovation Director	VHA Office of Patient Care Services
Gianna Rose	Patient Representative	Veterans Research Engagement Council (VREC)
Sheila Sullivan, PhD, RN, EBP-C	Director of Research, Evidence-Based Practice (EBP), & Analytics	VACO Office of Nursing Services

VA Self-Assessment

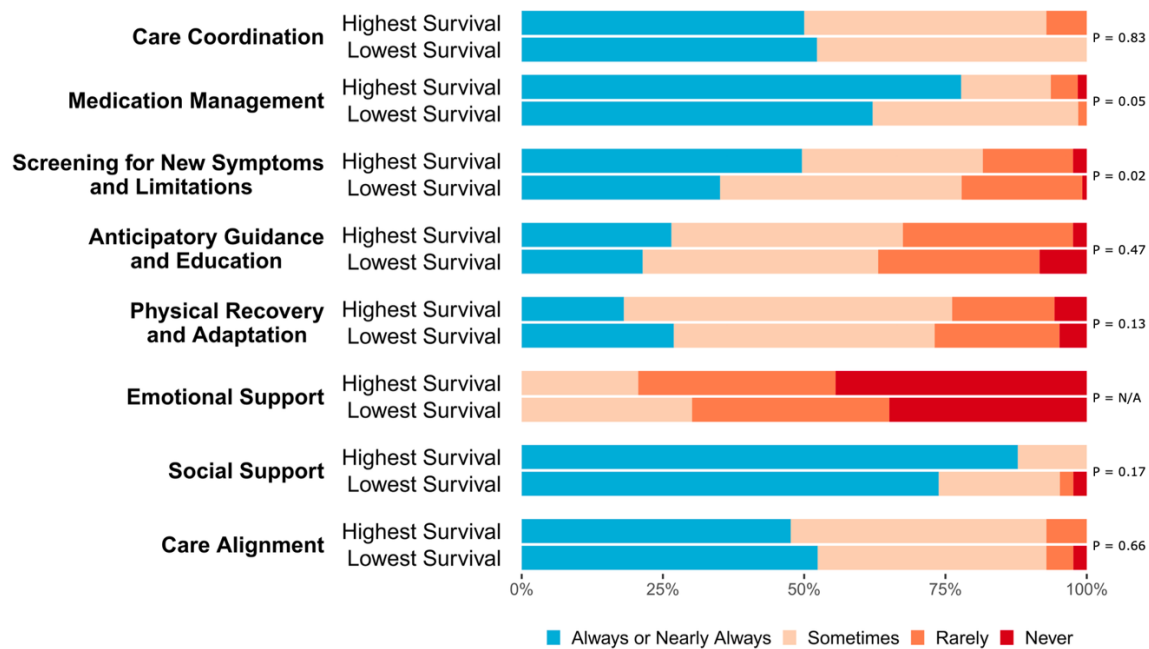


Figure 1. Reported frequency of use of recovery-based practices. Proportion of hospitals reporting frequency of use of each best practice domain grouped by hospitals with the highest risk-adjusted 90-d sepsis survival and those with lowest sepsis survival. p value < 0.05 indicates a significant difference in the proportion of hospitals reporting the use of practices “always/nearly always” within each domain.¹

Care Coordination Practices

#1. Scheduling recommended follow-up visits and testing prior to discharge.

Patients are often recommended to have specialty care follow-up after hospitalization for sepsis. However, follow-up appointments are not always scheduled prior to discharge, necessitating additional work for patients and caregivers to complete the recommended follow-up. Arranging follow-up prior to discharge reduces patient/caregiver burden and may improve follow-up rates.²

Evidence and recommendations in general or related populations

The Agency for Healthcare Research and Quality's Project RED (re-engineered discharge) is a set of activities and materials for improving the discharge process, aimed at reducing readmissions and posthospital emergency department visits.³ Project RED recommends determining primary care and specialty care follow-up needs prior to discharge, finding providers, and determining need for scheduling future tests.³ Further, they recommend making appointments with input from patient regarding best time and date for the appointment.³

Evidence and recommendations in patients with sepsis

We are not aware of literature of recommendations specific to patients with sepsis.

#2. Scheduling outpatient follow-up with physician, nurse practitioner, or physician assistant to occur within 2 weeks of discharge.

Patients are at increased risks for health complications and hospital readmission following sepsis.⁴ Early outpatient follow-up may help to support recovery and reduce hospital readmission.

Evidence and recommendations in general or related populations

The Agency for Healthcare Research and Quality's Project RED (re-engineered discharge) is a set of activities and materials for improving the discharge process, aimed at reducing readmissions and posthospital emergency department visits.³ Project RED recommends making a "follow-up appointment (preferably in the first week and no later than 2 weeks after discharge) to aid in a safe transition to the ambulatory setting."³

In 2013, the US Centers for Medicare and Medicaid Services adopted transitional care management payment codes to improve outcomes after hospital discharge.⁵ Clinicians who provide transitional care management receive increased reimbursement. Transitional care management requires contacting the patient within 2 business days of discharge and completing an office visit within 7 days for highly complex conditions and 14 days for moderately complex conditions.⁵ Transitional care management is billed in <10% of Medicare discharges, but is associated with reduced costs and mortality.⁵

Evidence and recommendations in patients with sepsis

The 2021 Surviving Sepsis Campaign Guidelines state "there is insufficient evidence to make a recommendation on early (within 7-14 days) post-hospital discharge follow-up as compared to routine post-hospital discharge follow-up."⁶ The panel recommends follow-up with a provider after hospital discharge to manage new impairments associated with sepsis. However, due to the low quality and lack of evidence specific to sepsis, the panel was unable to make a recommendation regarding timing of follow-up.⁶

In the 2021 IMPACTS trial, randomization to a multi-component Sepsis Transition and Recovery Program was associated with lower readmission or mortality as compared to usual care.⁷ The multi-component intervention included proactive telehealth assessments at <48hrs, 72-96hrs, and 7-10days post-discharge and escalation of concerns to an outpatient follow-up visit with primary care or transitional care clinic.⁸ Outpatient physician visits within 10 days occurred in 39% of intervention versus 30% of usual care patients.⁷

#3. Scheduling in-person outpatient follow-up within 2 weeks of discharge.

Patients are at increased risks for health complications and hospital readmission following sepsis.⁴ In-person versus follow-up post-hospitalization generally offers a more comprehensive assessment and allows for physical examination and potential for immediate intervention and add-on testing. By contrast, a telehealth appointment may be more convenient, particularly for patients with limited mobility or transportation issues.

Evidence and recommendations in general or related populations

There is limited data on the impact of in-person vs telehealth follow-up post-hospitalization. Smaller, single-center observational studies suggest telehealth may be a viable alternative with similar rates of hospital readmission.⁹

Screening Practices

#4. Screening for limitations in Instrumental Activities of Daily Living (IADLs) and need for Durable Medical Equipment.

In older adults, hospitalization for sepsis is associated with the development of 1-2 functional limitations, on average.¹⁰

Evidence and recommendations in general or related populations

The Agency for Healthcare Research and Quality's Project RED (re-engineered discharge) is a set of activities and materials for improving the discharge process, aimed at reducing readmissions and posthospital emergency department visits.³ Project RED recommends collaborating with the patient's case manager to ensure that durable medical needs are identified and equipment is obtained.³

Evidence and recommendations in patients with sepsis

The 2021 Surviving Sepsis Campaign Guidelines state "For adult survivors of sepsis or septic shock, we recommend assessment and follow-up for physical, cognitive, and emotional problems after hospital discharge" (best practice statement).⁶ The guidelines recommend assessment and follow-up for physical, cognitive, and emotional problems given the prevalence of new or worsened problems in these domains. However, there were insufficient evidence to suggest a specific assessment tool.⁶ The optimal approach will vary by patient and setting.⁶ At a minimum, clinicians should ask patients and families about new problems in these domains.⁶

#5. Screening for cognitive impairment.

In older adults, hospitalization for sepsis is associated with a three-fold increase in the prevalence of moderate-severe cognitive impairment (from 6.1% pre-sepsis to 16.7% post-sepsis).¹⁰ Milder forms of cognitive impairment (e.g., “cloudy thinking”) may be even more common, and likewise impair executive function and ability to complete work and other activities.

Evidence and recommendations in general or related populations

In a modified Delphi International Consensus study with 77 participants (including researchers, patients, caregivers, and research funders), cognitive function was selected as a core outcome measure for respiratory failure, underscoring the importance of this outcome.¹¹ This core outcome set has been recommended for all studies evaluating post-hospital patient outcomes,¹² as well as by a 2019 Society of Critical Care Medicine consensus conference on evaluating post-intensive care syndrome in adult patients after critical illness.¹³

Despite recommendations to measure cognitive function, the modified international Delphi Consensus study failed to achieve consensus for the most appropriate specific screening tool for cognitive function, after considering Mini-Mental State Examination, Montreal Cognitive Assessment, Mini-Cog, Wechsler Adult Intelligence Scale-4th Edition, and Addenbrooke’s Cognitive Examination-III. Although consensus was not reached, the Montreal Cognitive Assessment came closest with 55% agreement that it was “critical” for inclusion.¹¹ The 2019 Society of Critical Care medicine consensus conference provided a strong recommendation for use of the Montreal Cognitive Assessment to screen for cognitive impairment and suggested serial assessments beginning in the 2-4 weeks after hospital discharge.

Evidence and recommendations in patients with sepsis

The 2021 Surviving Sepsis Campaign Guidelines state “For adult survivors of sepsis or septic shock, we recommend assessment and follow-up for physical, cognitive, and emotional problems after hospital discharge” (best practice statement).⁶ The guidelines recommend assessment and follow-up for physical, cognitive, and emotional problems given the prevalence of new or worsened problems in these domains. However, there were insufficient evidence to suggest a specific assessment tool.⁶ The optimal approach will vary by patient and setting.⁶ At a minimum, clinicians should ask patients and families about new problems in these domains.⁶

#6. Screening for anxiety/depression.

Patients report high prevalence of anxiety and depression in the 2-3 months following critical illness (~30%).^{4,14,15} The extent to which anxiety or depression are exacerbated by sepsis is unclear. In a study of 439 Health and Retirement Study participants, the prevalence of clinically significant depressive symptoms was 28% before and 28% after sepsis.¹⁶ By contrast, in a population-based Danish cohort, 9912 critically ill patients without prior psychological history were more likely than hospitalized controls to receive new psychoactive prescriptions (12.7% vs 5.0%; $P<.001$) or new psychiatric diagnoses (0.5% vs 0.2%; $P<.001$) in the 3 months after hospitalization. It is unclear whether depression or anxiety are exacerbated by sepsis, or merely more common among patients who develop sepsis.

Evidence and recommendations in general or related populations

In a modified Delphi International Consensus study with 77 participants (including researchers, patients, caregivers, and research funders), mental health was selected as a core outcome measure for respiratory failure, underscoring the importance of this outcome.¹¹ This core outcome set has been recommended for all studies evaluating post-hospital patient outcomes,¹² as well as by a 2019 Society of Critical Care Medicine consensus conference on evaluating post-intensive care syndrome in adult patients after critical illness.¹³

The modified international Delphi Consensus¹¹ recommended the Hospital Anxiety and Depression Scale (HADS)¹⁷. The Society of Critical Care Medicine consensus conference likewise included a strong recommendation for screening with the Hospital Anxiety and Depression Scale.

Evidence and recommendations in patients with sepsis

The 2021 Surviving Sepsis Campaign Guidelines state “For adult survivors of sepsis or septic shock, we recommend assessment and follow-up for physical, cognitive, and emotional problems after hospital discharge” (best practice statement).⁶ The guidelines recommend assessment and follow-up for physical, cognitive, and emotional problems given the prevalence of new or worsened problems in these domains. However, there were insufficient evidence to suggest a specific assessment tool.⁶ The optimal approach will vary by patient and setting.⁶ At a minimum, clinicians should ask patients and families about new problems in these domains.⁶

In the 2021 IMPACTS trial, randomization to a multi-component Sepsis Transition and Recovery Program was associated with lower readmission or mortality as compared to usual care.⁷ The multi-component intervention included mental health screening with the Patient Health Questionnaire (PHQ)-2, with reflex administration of the PHQ-9 for positive PHQ-2.⁸ Mental health screening occurred in 55% of intervention vs 10% of control patients.

#7. Screening for post-traumatic stress disorder (PTSD).

Patients report high prevalence of stress disorder symptoms in the 1-6 months following critical illness (~44%).^{4,18} Furthermore, sepsis has been identified in observational studies as a risk factor for PTSD symptoms after critical illness.¹⁹

Evidence and recommendations in general or related populations

In a modified Delphi International Consensus study with 77 participants (including researchers, patients, caregivers, and research funders), mental health was selected as a core outcome measure for respiratory failure, underscoring the importance of this outcome.¹¹ This core outcome set has been recommended for all studies evaluating post-hospital patient outcomes,¹² as well as by a 2019 Society of Critical Care Medicine consensus conference on evaluating post-intensive care syndrome in adult patients after critical illness.¹³

The modified international Delphi Consensus¹¹ recommended the 22-item Impact of Event Scale-Revised (IESR)²⁰. The Society of Critical Care Medicine consensus conference included a weak recommendation for IES-R or the abbreviated IES-6.

Evidence and recommendations in patients with sepsis

The 2021 Surviving Sepsis Campaign Guidelines state “For adult survivors of sepsis or septic shock, we recommend assessment and follow-up for physical, cognitive, and emotional problems after hospital discharge” (best practice statement).⁶ The guidelines recommend assessment and follow-up for physical, cognitive, and emotional problems given the prevalence of new or worsened problems in these domains. However, there were insufficient evidence to suggest a specific assessment tool.⁶ The optimal approach will vary by patient and setting.⁶ At a minimum, clinicians should ask patients and families about new problems in these domains.⁶

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Appendix 2

OVeR-Sepsis Expert Panel Booklet

Second Panel Meeting
February 12, 2025

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Purpose

The goal of the Optimizing Veteran Recovery from Sepsis (OVeR-Sepsis) IIR is to identify and prioritize best practices for sepsis recovery.

We will consider select care practices within the following domains:

- Care Coordination
- Medication management
- Screening for new symptoms or limitations
- Anticipatory guidance and education ([Meeting 2](#))
- Physical recovery and adaptation ([Meeting 2](#))
- Emotional support
- Social Support ([Meeting 2](#))
- Care Alignment

Rating Criteria

Domain	Rating	Considerations
Validity	1= not valid 9 = valid	• Is there adequate scientific evidence or professional consensus to support the practice? • Are there identifiable health benefits to patients who receive the care practice?
Importance	1=not important 9=important	• What is the degree of importance of the practice in supporting recovery? • What is the magnitude of benefit?
Resource-Intensity	1=minimal resources needed 9=maximal resources needed	• How resource-intensive, in terms of expense and staff time, is it to provide the care practice to all patients discharged from hospitalization for sepsis?

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Stuart Jacobson	Patient Representative	Veterans Research Engagement Council (VREC)
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Stephanie Parks Taylor, MD, MS	Chief, Division of Hospital Medicine; Professor, Internal Medicine	University of Michigan
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VA Self-Assessment

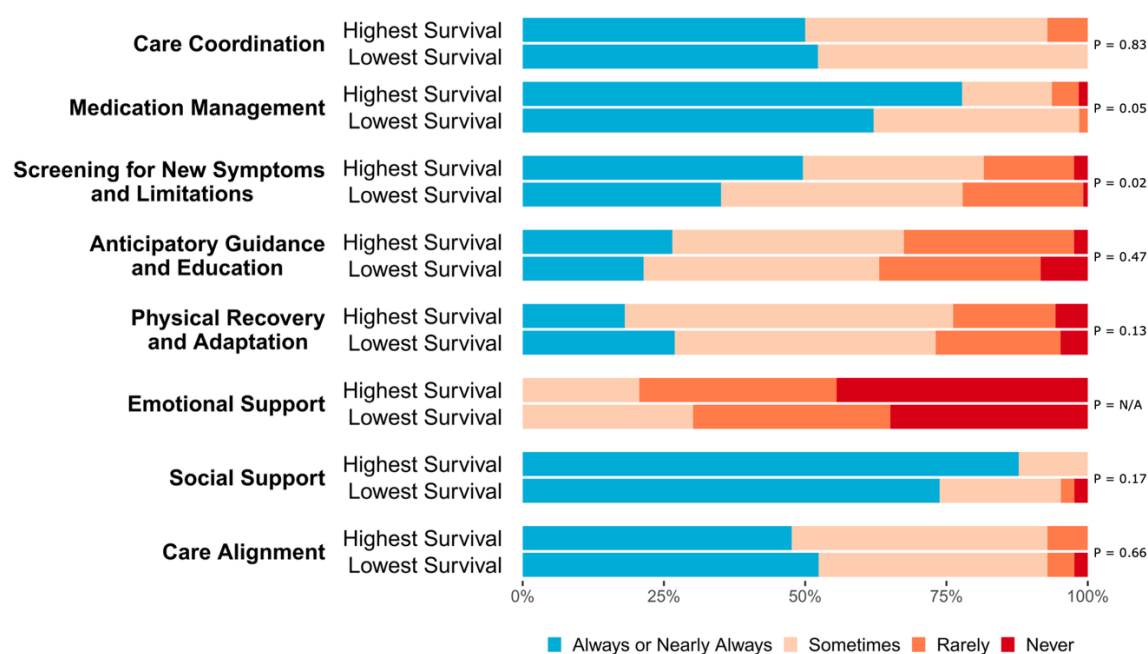


Figure 1. Reported frequency of use of recovery-based practices. Proportion of hospitals reporting frequency of use of each best practice domain grouped by hospitals with the highest risk-adjusted 90-d sepsis survival and those with lowest sepsis survival. p value < 0.05 indicates a significant difference in the proportion of hospitals reporting the use of practices “always/nearly always” within each domain.¹

Anticipatory Guidance and Education Practices

#1. Educating patients on signs and symptoms of sepsis, and when to seek re-evaluation.

Lay person awareness of sepsis is limited and lags behind other time-sensitive medical emergencies such as heart attack and stroke.² In a 2022 nationally-representative survey in Canada, 61% of respondents had heard of sepsis, but far fewer were able to define sepsis (52%), list common symptoms (32%), list risk factors (16%), or list prevention strategies (36%).³ We are not aware of similar data specific to individuals who have had sepsis, but our experience is that knowledge gaps are similarly common.

When patients develop signs and symptoms of sepsis (e.g., infection with concurrent symptoms of end-organ dysfunction such as confusion), the initial instinct is often to “get some rest”, not to present for evaluation. Michigan sepsis registry data indicate that many patients present for evaluation in later stages of sepsis, when it is less responsive to treatment.

Recurrent infection or sepsis is the most common cause of hospital readmission in the 90 days after discharge from hospitalization for sepsis.⁴

Evidence and recommendations in general or related populations

The Agency for Healthcare Research and Quality’s Project RED (re-engineered discharge) is a set of activities and materials for improving the discharge process, aimed at reducing readmissions and posthospital emergency department visits.⁵ Project RED recommends providing education on the primary diagnosis, what constitutes an emergency, and what should be done in case of emergency (e.g., call 911, return to the hospital).⁵ A 2021 Systematic Review and Meta-analysis of Interventions to Improve Communication at Hospital Discharge and Rates of Readmission finds that interventions regarding disease and its management were associated with reduced rate of readmission (relative risk 0.55 across 6 studies with 538 total patients).⁶ This review included one trial of patients hospitalized with community-acquired pneumonia.⁷ Education addressed fluid intake, medication adherence, vaccination, pneumonia diagnosis and management.⁷ Patients randomized to the intervention had higher patient satisfaction scores and lower rates of ED and hospital readmission in the 30 days post-discharge.⁷

Evidence and recommendations in patients with sepsis

In the 2021 IMPACTS trial, randomization to a multi-component Sepsis Transition and Recovery Program was associated with lower readmission or mortality as compared to usual care.⁸ The multi-component intervention included patient education on symptoms of sepsis and recurrence. The 2021 Surviving Sepsis Campaign guidelines include a strong recommendation to educate patients and families about sepsis and suggests providing both written and verbal education both before and after hospital discharge.⁹ In 2023, the

US Centers for Disease Control and Prevention published the Hospital Sepsis Program Core Elements, a high-level guidance on establishing and running effective hospital programs to improve management and outcomes of sepsis.^{10,11} The CDC Core Elements recommend providing both written and verbal education on sepsis to patients, families, and caregivers prior to hospital discharge.

#2. Educating patients on common symptoms after sepsis (e.g., fatigue, shortness of breath, brain fog).

Sepsis recovery is associated with the development of new and worsening cognitive, physical, and emotional symptoms, sometimes termed “post-sepsis syndrome”.^{12,13} Available literature suggests that only a minority of patients are counseled on such sequelae.¹⁴

Evidence and recommendations in patients with sepsis

The 2021 Surviving Sepsis Campaign guidelines include a strong recommendation to educate patients and families about sepsis and suggest providing both written and verbal education both before and after hospital discharge on post-sepsis syndrome.⁹

#3. Counseling patients on when to return to normal activities (e.g., work, driving, graded activity, exercise).

Patients are at increased risks for health complications and hospital readmission following sepsis and determining when to return to activities can be difficult for the patient and the provider.¹³ In-person appointments follow-up post-hospitalization generally offers a comprehensive assessment and allows for physical examination and potential for immediate intervention and add-on testing. By contrast, a telehealth appointment may be more convenient, particularly for patients with limited mobility or transportation issues.

Evidence and recommendations in general or related populations

The Agency for Healthcare Research and Quality's Project RED (re-engineered discharge) is a set of activities and materials for improving the discharge process, aimed at reducing readmissions and posthospital emergency department visits.⁵ Project RED recommends that the post-hospital care plan include recommendations on activity level and prescriptions.⁵

Physical Rehabilitation and Adaptation practices

#4. Physical therapy evaluation prior to hospital discharge.

In older adults, hospitalization for sepsis is associated with the development of 1-2 functional limitations, on average.¹⁵ There are multiple potential causes of functional decline including [deconditioning](#), myopathy, neuropathy, cardiorespiratory impairments, cognitive impairment, or a combination of these issues.

Evidence and recommendations in general or related populations

Physical therapists are expert at evaluating functional abilities and can recommend appropriate discharge location and services for patients after acute illness. In a study of 762 patients evaluated by 40 acute care physical therapists, physical therapists' recommendations for discharge location and services were implemented 83% of the time. Patients whose care plan deviated from [the](#) physical therapist recommendations were 2.9-fold more likely to be readmitted.¹⁶ However, triaging of physical therapy evaluation based on mobility scoring (e.g., ≤18 points on the 6-item basic mobility inpatient short form) may conserve resources.¹⁷

Evidence and recommendations in patients with sepsis

Several expert panels have suggested that rehabilitation with physical, occupational, and speech therapy benefits patients who develop new weakness following sepsis.^{13,18,19}

The 2021 Surviving Sepsis Campaign Guidelines recommend assessment and follow-up for physical, cognitive, and emotional problems after hospital discharge.⁹

#5. Assess if patient needs referral to speech language pathology (SLP).

In older adults, hospitalization for sepsis is associated with functional decline. Swallowing dysfunction (dysphagia) and aspiration are estimated to occur in 20%-50% of patients after invasive mechanical ventilation, and may occur due to neuromuscular weakness, altered sensation, impaired cognition, or dyssynchronous breathing and swallowing.^{20,21} Aspiration causing pneumonia or pneumonitis is a top 10 reason for re-hospitalization after sepsis.⁴

Evidence and recommendations in general or related populations

Several expert reviews recommend performing a water swallow test (e.g., Yale Swallow Protocol^{22,23}) following extubation and referring patients who fail the water swallow test for further evaluation by SLP.^{20,21}

Evidence and recommendations in patients with sepsis

Sepsis has been identified as a risk factor for swallowing dysfunction.²⁴

Social Support

#6. Screen for social needs (e.g., homelessness, food insecurity).

Non-medical social needs influence long-term health outcomes, particularly hospital readmission. Screening for economic and social support may help reduce inequities.

Evidence and recommendations in general or related populations

The Agency for Healthcare Research and Quality's Project RED (re-engineered discharge) is a set of activities and materials for improving the discharge process, aimed at reducing readmissions and posthospital emergency department visits.⁵ Project RED recommends assessing social support available at home and providing names and contact information for social support persons.⁵

Evidence and recommendations in patients with sepsis

The 2021 Surviving Sepsis Campaign Guidelines recommend screening for economic and social support needs and making referrals where available.⁹ The CDC Hospital Sepsis Program Core Elements recommend screening for social vulnerability (e.g., food and housing instability) and referral to available resources as needed.¹¹

Several studies suggest social vulnerability is not associated with worse long-term mortality from sepsis or COVID in VA, perhaps because VA is a leader in addressing social risk factors.^{25,26} However, studies outside VA have shown that neighborhood vulnerability is associated with risk of re-hospitalization after sepsis.²⁷

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Appendix 3

OVeR-Sepsis Expert Panel Booklet

Third Panel Meeting
March 13, 2025

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Purpose

The goal of the Optimizing Veteran Recovery from Sepsis (OVer-Sepsis) IIR is to identify and prioritize best practices for sepsis recovery.

We will consider select care practices within the following domains:

- Care Coordination
- Medication management
- Screening for new symptoms or limitations
- Anticipatory guidance and education ([Meeting 2](#))
- Physical recovery and adaptation ([Meeting 2](#))
- Emotional support
- Social Support ([Meeting 2](#))
- Care Alignment

Rating Criteria

Domain	Rating	Considerations
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Resource-Intensity	1=minimal resources needed 9=maximal resources needed	• How resource-intensive, in terms of expense and staff time, is it to provide the care practice to all patients discharged from hospitalization for sepsis?

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VA Self-Assessment

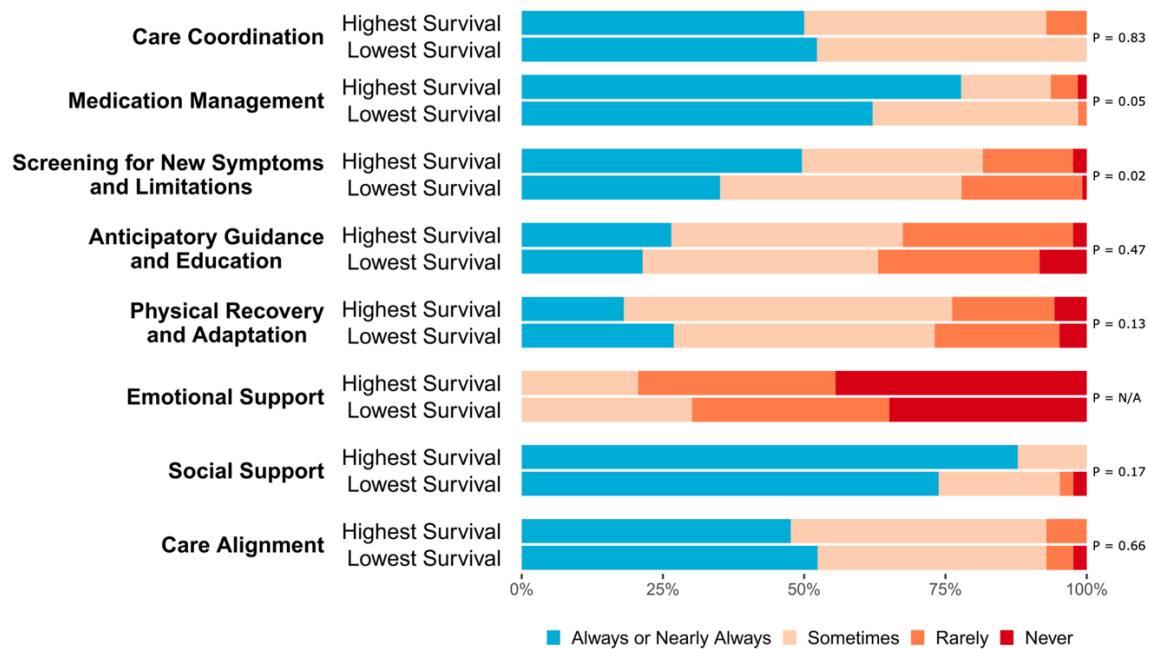


Figure 1. Reported frequency of use of recovery-based practices. Proportion of hospitals reporting frequency of use of each best practice domain grouped by hospitals with the highest risk-adjusted 90-d sepsis survival and those with lowest sepsis survival. p value < 0.05 indicates a significant difference in the proportion of hospitals reporting the use of practices “always/nearly always” within each domain.¹

Emotional Support

#1. Referring patients with critical illness to peer support programs.

Sepsis, and critical illness more generally, is associated with the development of new or worsened impairments, such as new or worsened cognitive function, mental health, and/or physical function. Peer support programs have been proposed as a mechanism to support recovery after critical illness.²

Evidence and recommendations in patients with sepsis

The 2021 Surviving Sepsis Campaign Guidelines suggest referral that adult survivors of sepsis or septic shock and their families be referred peer support programs.³ This recommendation was based on observational studies examining the impact of varied models of peer support programs on patients after critical illness (i.e., not specific to sepsis). These studies suggest that peer support programs may reduce psychological morbidity, improve social support, and improve self-efficacy.

Evidence and recommendations in related populations

An in-ICU peer support program has been developed in at least one VA hospital. Surveys of participants in this program suggest the program was helpful (94% reported that attending the peer support group “very much” made them feel emotionally supported and helped them learn from other ICU patients and families on how best to cope with the current situation.⁴

Since the 2021 SSC Guidelines, a pilot trial of a virtual peer support program 4 weeks after hospital discharge was published, showing high rates of enrollment, participation, and satisfaction.⁵ The intervention involved weekly zoom meeting for 4 weeks, beginning one month after critical illness.⁵ A larger, multi-center trial of this intervention is in process in Australia (ACTRN12624000267550).

Medication Management.

#2. Physician or pharmacist review and adjustment of inpatient and outpatient medications before discharge.

Medication reconciliation is “the process of comparing a patient’s medication orders to all of the medications that the patient has been taking.”

Review and adjustment of medications refers to optimizing medications to account for any physiologic changes during sepsis hospitalization. For example, this may include dose-optimization or discontinuation of medications to account for physiologic changes such as weight loss, worsening of renal function, or lower blood pressure. Alternatively, restarting of medications that were held on admission.

Evidence and recommendations in related populations

There are multiple studies suggesting that medication errors are common following critical illness. Medications intended for temporary use during critical illness may be continued,⁶ while chronic medications intended to be held just temporarily may not be resumed at discharge.⁷ In a trial of hospitalized patients prescribed at least 5 chronic medications, being randomized to a multifaceted pharmacist intervention with medication optimization, reconciliation, education, and follow-up was associated with reduced readmission or ED visits in the subsequent 6 months.⁸

Evidence and recommendations in patients with sepsis

The 2021 Surviving Sepsis Campaign Guidelines recommend reconciling medications at ICU and hospital discharge.³ The Guidelines also mention adjusting medication dosing regularly in response to dynamic physiologic changes during and after critical illness.

The 2022 IMPACTs trial showed benefit of a Sepsis Transition and Recovery Program. A key component of the intervention was medication optimization, or “review and adjustment of medications”.^{9,10}

#3. Counseling the patient and/or caregiver regarding the medication list and indications before discharge.

Most patients discharged from hospitalization for sepsis are prescribed multiple medications. Furthermore, the types and doses of medications may change during hospitalization.

Evidence and recommendations in general or related populations

The Agency for Healthcare Research and Quality's Project RED (re-engineered discharge) is a set of activities and materials for improving the discharge process, aimed at reducing readmissions and posthospital emergency department visits.¹¹ Project RED recommends that the post-hospital care plan include an updated list of all medicines with appropriate dose and schedule.¹¹ Furthermore, Project RED recommends teaching patients about any changes to medicine (e.g. any new medications, any discontinued medications, or changes in dosing or frequency).

In a trial of hospitalized patients on at least 5 chronic medications, randomizations to a multifaceted pharmacist intervention with medication optimization, reconciliation, and education was associated with reduced readmission or ED visits in the subsequent 6 months.⁸

Despite broad recognition of the importance of teaching patients about changes to their medication list, gaps in practice remain. In a 2023 study of patient education, 27% of patients discharged on a new medication received no verbal discussion of the change on the day of discharge.¹² 53% were informed of the change, but not of the reason for the change.¹²

Palliation

#4. Formally readdressing goals of care before discharge.

Goals of care has been defined as “the overarching aims of medical care for a patient that are informed by the patients’ underlying values and priorities, established within the existing clinical context, and used to guide decisions about the use of or limitation(s) on specific medical interventions”.¹³

Patients who survive sepsis may experience new or worsened physical, cognitive, or emotional morbidity, as well as heightened risk of hospital readmission and death.¹⁴ While default medical practice in the U.S. maximizes longevity, many patients prefer to optimize function or comfort.¹⁵ Thus, sepsis often represents an acute change in health status, so post-sepsis may be an important time to revisit and confirm goals and preferences. Timely discussion about care preferences enables delivery of goal-concordant care, improves patient and caregiver satisfaction, and may reduce undesired, high-intensity healthcare interventions.⁹

Evidence and recommendations in general or related populations.

Identifying and supporting patients’ care goals was identified as the top priority in The Improving Hospital Outcomes through Patients Engagement (i-HOPE) Study.¹⁶ The i-HOPE Study used a collaborative approach to create a prioritized agenda for improving the care of adult hospitalized patients.

Evidence and recommendations in patients with sepsis

The 2021 Surviving Sepsis Campaign Guidelines Sepsis recommend discussing goals of care (GoC) in all patients hospitalized for sepsis, and suggest discussing GoC within the first 3 days of hospitalization.³ However, the limited available data suggests that GoC are discussed during only a minority of hospitalizations for sepsis, as well as gaps in the provision of goal-concordant care.¹⁷

In the 2021 IMPACTS trial, randomization to a multi-component Sepsis Transition and Recovery Program was associated with lower readmission or mortality as compared to usual care.⁹ The multi-component intervention included a recommendation for Goals of Care conversation or consultation to palliative care if the patient has a serious chronic illness and either failure to improve after 5 days or a hospitalization in the prior 60 days.¹⁰

Monitoring

#5. Calling patients within 3 calendar days after discharge to assess for new/worsened symptoms and answer any questions related to their hospitalization.

Hospitalization for sepsis is associated with a high rate of re-hospitalization and post-discharge mortality. Approximately 20% of patients discharged alive after sepsis (and not to hospice) are re-hospitalized and approximately 5% die in the 30 days post-discharge.

Evidence and recommendations in general or related populations

The Agency for Healthcare Research and Quality's Project RED (re-engineered discharge) is a set of activities and materials for improving the discharge process, aimed at reducing readmissions and posthospital emergency department visits.¹¹ Project RED recommends providing telephone re-enforcement of the discharge plan within 72 hours of discharge.¹¹ The objectives of this phone call are to review appointments, medicines, medical issues, and actions to take if problems occur.

Evidence and recommendations in patients with sepsis

In the 2021 IMPACTS trial, randomization to a multi-component Sepsis Transition and Recovery Program was associated with lower readmission or mortality as compared to usual care.⁹ The multi-component intervention included telehealth monitoring at <48 hours, 72-96 hours, and 7-10 days post-discharge.¹⁰ The <48 hours touchpoint included medication reconciliation and symptom assessment, specifically assessing for fever, new or worsening symptoms (e.g., dyspnea, diarrhea, redness, swelling, pain), and new functional limitations (e.g., not out of bed, not eating).¹⁰ Concerns identified through proactive symptom monitoring prompted follow-up with primary care or transitional care.¹⁰

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