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Post-intensive care syndrome (PICS), an AAST Critical Care Committee Consensus Guideline: expectations, mental health impairments, financial hardship, and caregiver burden in PICS

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INTRODUCTION

Post-intensive care syndrome (PICS) is defined as new or worsening physical, cognitive, psychological, or thromboinflammatory impairments that develop during or after critical illness and persist beyond hospital discharge.[1] These impairments reflect a multifactorial response to prolonged critical illness and the physiologic stress of intensive care, often persisting for months to years after hospital discharge, and significantly impacting patients' recovery, functional status, and quality of life. Recognition of PICS has increased during the past decade as survival after critical illness has improved, shifting the focus toward long-term outcomes among intensive care unit (ICU) survivors.

Surgical and trauma patients represent a particularly important population in the study of PICS. These patients frequently experience abrupt, life-altering illnesses or injuries that require prolonged hospitalization, invasive procedures, mechanical ventilation, and extended ICU exposure. Although advances in critical care have improved survival, many survivors face persistent physical disability, cognitive dysfunction, psychological distress, and ongoing healthcare needs that complicate recovery and reintegration into daily life. Importantly, the consequences of critical illness extend beyond the individual patient and frequently affect family members and caregivers, who may experience substantial emotional, social, and financial burdens during the recovery process. However, much of the foundational PICS literature is derived from heterogeneous ICU populations, and trauma-specific and surgery-specific recovery trajectories remain incompletely characterized. The applicability of the PICS framework to trauma and surgical populations, including the available evidence supporting its physical, cognitive, and thromboinflammatory domains, is reviewed in the first guideline of this consensus series.[1]

Building on that framework, the present guideline focuses on longitudinal follow-up after hospital discharge and discusses the potential role and implementation of dedicated PICS clinics designed to identify and address persistent sequelae. Here and throughout this article, the term 'after discharge' refers to the period after hospital discharge rather than discharge from the ICU or transfer to another level of care, unless otherwise specified. Importantly, PICS is best understood not as a static condition but as a dynamic recovery trajectory influenced by patient vulnerability, ICU risk factors, and post-discharge factors. Effective management requires longitudinal, multidisciplinary care across transitions from ICU to outpatient recovery. The potential value of PICS clinics extends beyond the identification and treatment of persistent sequelae to include enabling the future discovery of recovery and failed recovery phenotypes and facilitating the interchange of information across the continuum of recovery. Dedicated PICS clinics represent one potential model for structured longitudinal follow-up; however, current evidence does not establish their superiority over other models of longitudinal care. The approach to longitudinal follow-up should therefore be tailored to local expertise, resources, existing care pathways, patient access, and potential financial and logistical burdens. No single model or staffing structure for longitudinal PICS care has been established. Depending on local resources and existing care pathways, follow-up may be coordinated through surgical teams, primary care, critical care recovery programs, or multidisciplinary clinics, with rehabilitation, mental health, social work, and other services incorporated according to identified patient needs.

The scope of PICS extends beyond physical impairment, cognitive dysfunction, and thromboinflammatory dysregulation. Survivors of critical illness frequently experience anxiety, depression, post-traumatic stress disorder (PTSD), financial hardship, challenges returning to work, and disruptions in social and family functioning. Likewise, family members and caregivers may develop psychological distress, caregiver burden, and reduced quality of life, a phenomenon increasingly recognized as PICS–family (PICS-F). Together, these patient-centered and family-centered outcomes can profoundly influence recovery, healthcare utilization, and long-term well-being.

In this follow-up consensus document, we examine these under-recognized domains and

provide pragmatic, clinician-focused recommendations for their identification and management including: (1) the diagnosis, evaluation, management, and treatment of mental health impairments such as anxiety, depression, and PTSD; (2) the financial hardship experienced by patients and families during recovery; and (3) the substantial burden placed on caregivers of patients with PICS. Critically, addressing PICS requires a longitudinal, multidisciplinary framework that integrates ICU care, structured transitions, and sustained outpatient follow-up for both patients and caregivers.

METHODS

The American Association for the Surgery of Trauma (AAST) Critical Care Committee selected PICS as a clinically significant topic for review in the context of critical illness in surgical patients. Because of the broad nature of the topic, multiple working groups from the committee's membership have participated in and written multiple publications devoted to describing the intricacies of PICS. Like previous consensus documents published by this committee, each member of the working group was assigned a specific subtopic and conducted a targeted literature search using databases such as PubMed and Embase. Searches were primarily focused on English-language publications and on studies involving adult surgical ICU patients (aged ≥16 years), recognizing that a significant portion of the literature surrounding PICS is based on mixed ICU populations where available. Priority was given to randomized controlled trials, large observational studies, and societal guidelines when available; other studies were included only if they provided unique, important, or non-replicated findings.

Studies were identified and selected based on their relevance to the assigned subtopics, and each working group member appraised the quality and applicability of the evidence at their discretion. The methodology did not follow the iterative selection or appraisal processes characteristic of a systematic review; instead, the search and selection strategies were determined by individual authors.

The recommendations formulated were subsequently presented to the entire AAST Critical Care Committee for evaluation. Consensus was defined a priori as agreement among ≥80% of committee members during structured discussions. Recommendations are based on available evidence supplemented by expert consensus when data are limited. In cases where disagreements arose, further discussion was encouraged to reach a resolution; any points for which consensus could not be achieved were recorded as 'no consensus' in the final document.

It is important to clarify that this work represents a consensus of expert opinions rather than a comprehensive systematic review. The recommendations apply to adult surgical and trauma patients who experienced ICU stays and should be interpreted in the context of the committee's expertise and the available evidence. However, most of the studies referenced in this consensus document were not performed in surgical and/or trauma patients. Thus, these recommendations extrapolate findings from mixed critical care populations to surgical critically ill patients. In subsequent sections, each recommendation explicitly states its strengths and limitations to guide both interpretation and clinical application.

Disclaimer from the AAST Critical Care Committee

This work reflects the expert opinion and recommendations of the AAST Critical Care Committee. These recommendations support, but do not replace, individualized clinical decision-making. Healthcare professionals should rely on their expertise and consider the unique circumstances of each patient when making treatment choices. The recommendations do not address every possible approach to prevention, diagnosis, or treatment. The AAST is not responsible for any harm or damage resulting from the use of this information.

Question

What are the major concerns of trauma and surgical patients and their families after prolonged ICU admission?

Recommendation

Patient and family concerns after an ICU stay for trauma and surgical illness commonly center around four interrelated domains: (1) physical and cognitive impairment affecting independence and functional recovery; (2) caregiver burden and changes in family roles; (3) return to work, financial hardship, and socioeconomic consequences for both patients and families; and (4) emotional and psychological recovery of both patients and family members after critical illness. We recommend a patient-centered and family-centered approach that prioritizes functional recovery, psychological support, caregiver resources, and access to social and financial services based on available resources and local infrastructure.

DISCUSSION

Patients and families frequently experience a broad range of challenges during and after recovery from critical illness. A central concern after a prolonged ICU stay is the high prevalence of persistent physical, cognitive, and psychological impairments experienced by ICU survivors, which affect a substantial proportion of this patient population.[2–4] From the perspective of patients and families, several key thematic concerns have been consistently identified.

Return to independence is a primary concern for patients and families. Families are frequently concerned about increased caregiver burden resulting from the patients' physical impairment and cognitive dysfunction.[3 5 6] Families worry about whether patients will regain the ability to independently perform activities of daily living and return to their pre-illness level of functioning. Physical barriers to independence include generalized weakness, decreased exercise tolerance, contractures, vocal cord injury, and other complications of prolonged critical illness or mechanical ventilation that can limit functional recovery.[5 7] Cognitive impairments such as deficits in memory, attention, and executive functioning further complicate the return to independence.[8]

Functional limitations, defined as the combined impact of physical and cognitive impairments, can affect physical abilities, including driving, increasing caregiver responsibilities, and reliance on family members for transportation.[4] Inability to return to work compounds physical, psychological, and socioeconomic stressors for both patients and families. The interplay of these described factors contributes to additional risk for future loss of independence. The loss of income, prolonged rehabilitation, and medical costs and access issues further burden patients and families.[5]

Cognitive dysfunction limits patient participation in rehabilitation efforts, further compounding PICS problems for both patients and their families. Furthermore, PICS has been associated with increased risk of dementia-like brain disease.[9]

Emotional and psychological recovery represents another major challenge for both patients and caregivers. Patients and family members may experience flashbacks, anxiety, depression,

post-traumatic stress symptoms, emotional withdrawal, or feelings of disconnection. These experiences may alter relationship dynamics within the family unit.[3] During attempts to reconstruct the narrative of the critical illness experience, differences in perception may arise. Patients may have fragmented or incomplete memories of their ICU stay, whereas family members often retain vivid and emotionally intense recollections of events.[10] This difference in recollection can contribute to misunderstanding or emotional strain during recovery. Patients may also experience survivors' guilt related to the perceived burden placed on their families. Family caregivers may experience ambivalence, emotional fatigue, or stress related to the responsibilities of providing ongoing care.[10] The uncertain and prolonged trajectory of recovery after critical illness may further contribute to anxiety and psychological distress for both patients and their families.[6]

Financial and occupational concerns represent another major source of stress during recovery. Patients and families frequently face loss of income, reduced employment opportunities, increased healthcare expenditures, and prolonged rehabilitation costs. These challenges often occur simultaneously with ongoing physical and psychological recovery, creating substantial strain on household resources and family functioning. Financial hardship may also affect access to rehabilitation services, medications, transportation, and follow-up care, thereby influencing long-term recovery outcomes.

Taken together, these concerns highlight that recovery from critical illness extends far beyond hospital discharge. Clinicians should recognize PICS as a chronic condition characterized by heterogeneous recovery trajectories that affect patients and families across multiple domains of health and well-being. Outcomes vary in both magnitude and duration and are influenced by numerous patient-level, illness-level, and system-level factors. Although further research is needed to better define these relationships, effective management requires a longitudinal, multidisciplinary, and individualized approach that integrates expertise across healthcare disciplines and emphasizes patient-centered and family-centered care, empowerment, education, and access to supportive resources.

Question

Which evaluations are most useful for diagnosing mental health impairment in PICS in surgical and trauma patients?

Recommendation

Patients with ICU stays >48 hours or those deemed high risk by the clinical team should be evaluated for psychological dysfunction associated with PICS: anxiety, depression, and trauma-related symptoms including PTSD. Standardized screening should start in the ICU and occur during care transitions from the inpatient setting through outpatient follow-up to capture evolving or persistent symptoms over time.

If standardized protocols are not already in place, we recommend using validated tools such as the Hospital Anxiety and Depression Scale (HADS) for anxiety and depression, and the Post-Traumatic Stress Syndrome 14-Question Inventory (PTSS-14) for trauma-related symptoms and PTSD during post-discharge recovery when PTSD-related symptoms can be more reliably assessed.

DISCUSSION

Mental health impairment after prolonged intensive care stays is common and frequently underdiagnosed among survivors of critical illness.[11] Patients with pre-existing psychological disorders may experience worsening of their symptoms during or after critical illness, and these disorders can predispose them to the eventual development of PICS-associated mental health issues.

Several aspects of the ICU experience may increase the likelihood of developing psychological impairment after discharge. Factors identified by the Society of Critical Care Medicine include sepsis, acute respiratory distress syndrome, delirium, and shock.[7 12] Patients are also at increased risk for persistent psychological symptoms if they develop early mental health disturbances during their ICU stay, including anxiety, post-traumatic stress symptoms, or early depressive symptoms.[12–14] In addition, delirium can aggravate PICS through complex interactions between physiological and psychiatric processes.[15]

Among survivors of critical illness, anxiety, depression, and PTSD represent the most reported psychological impairments after prolonged ICU admission.[16] Several validated screening instruments are available to evaluate these conditions. The HADS is widely used to assess anxiety and depression, whereas the PTSS-14 inventory is commonly used to evaluate PTSD symptoms in PICS populations.[17] Importantly, these instruments are screening tools intended to identify patients who may benefit from further evaluation and should not be considered diagnostic in isolation.

Screening prior to hospital discharge using the HADS and the PTSS-14 may be performed by a range of trained healthcare professionals, including physicians, nurses, and allied health staff, as these are self-report screening instruments used in clinical practice.[18 19] Patients who remain in a critical care environment for more than 48 hours or who are considered high risk by the treating team should be considered for screening.[20]

The evaluation should also include a review of the patient's current medications, preadmission mental health history, and baseline cognitive and functional status compared with status at discharge.[21] Consideration should be given to social support, caregiver concerns, and psychosocial stressors that may influence recovery and contribute to persistent psychological symptoms.

Patients who screen positive should be referred for early psychological evaluation and intervention.[22] Patients who screen as low risk may benefit from psychoeducation and structured discharge resources that address expected emotional and psychological responses after critical illness, as part of comprehensive post-ICU follow-up services aimed at identifying and addressing unmet health needs related to psychological outcomes.[12 14 23]

Patients referred to a dedicated PICS clinic should undergo repeat screening approximately 2 weeks to 4 weeks after hospital discharge.[21] This follow-up evaluation allows clinicians to identify individuals who develop delayed psychological symptoms during the early recovery period.[24] Because psychological symptoms often emerge or worsen after discharge, a single screening assessment may be insufficient to capture the full burden of mental health impairment.

For patients with persistent symptoms or ongoing risk factors, serial evaluations every 3 months for up to 1 year may be beneficial.[14 25–27] Longitudinal surveillance allows clinicians to monitor symptom progression, assess response to interventions, and facilitate timely referral to mental health professionals when indicated. Maintaining connection with the healthcare system after ICU discharge allows clinicians to identify emerging complications, provide anticipatory guidance, coordinate multidisciplinary support, and ensure that recovery challenges are addressed within the context of the patient's critical illness rather than as isolated downstream symptoms. Understanding

the source of a recovering patient's ongoing challenges may support both mental and physical recovery by facilitating access to appropriate resources, informing primary medical providers of specific recovery needs, and allowing insights from patient recovery experiences to inform future ICU care for similar patients.

It is important to note that significant knowledge gaps remain regarding the biological, psychological, and social determinants of recovery, including the identification of recovery and failed recovery phenotypes, the development of risk prediction models, and the optimal timing and targets for intervention. These gaps further highlight the importance of interconnected systems of care that can better serve patients while advancing our understanding of recovery after critical illness.

Question

What patient and disease factors increase the risk of developing PICS-related mental health impairments in surgical and trauma patients?

Recommendation

Risk factors for PICS-related mental health impairments (including PTSD, anxiety, depression, and persistent stress symptoms) in surgical and trauma ICU populations can be conceptualized within a biopsychosocial framework encompassing: (1) pre-ICU patient vulnerability including pre-existing psychiatric illness, baseline cognitive impairment, younger age, female sex, prior trauma exposure, and limited social support, (2) in-ICU exposure variables including delirium, deep or prolonged sedation, prolonged mechanical ventilation, uncontrolled pain, ICU-related hallucinations or delusional memories, severe physiologic derangements such as sepsis or shock, and sleep and environmental disruption, and (3) post-ICU recovery determinants including absence of structured follow-up, persistent physical disability, ongoing medical complications or chronic pain, and family or caregiver psychological distress. Clinicians should routinely assess risk factors across all three domains and incorporate this information into discharge planning, follow-up strategies, and targeted referral pathways for psychological support and rehabilitation when clinically indicated.

DISCUSSION

Patients recovering from critical illness in surgical and trauma ICUs develop PICS-related mental health complications through an interplay of patient-specific vulnerabilities, injury and illness severity, ICU-related exposures, and post-discharge stressors.[28] Patient-related factors represent the baseline vulnerability for PICS-related mental health impairment. Individuals with pre-existing psychiatric disorders such as depression, anxiety, PTSD, or substance use disorders have diminished psychological reserve and consistently experience higher rates of post-ICU psychological symptoms.[29] Younger age and female sex have also been associated with increased risk of post-traumatic stress and affective symptoms in ICU survivors.[30]

In addition, patients with prior trauma exposure or adverse childhood experiences are more likely to develop dysregulated stress responses during critical illness, predisposing them to persistent anxiety or PTSD after discharge.[29] Low health literacy, poor social support, or fragmented social networks limit coping mechanisms, reduce adherence to follow-up care, and increase perceived threat during and after the ICU stay.[29 30] ICU teams caring for surgical and trauma ICU patients should therefore routinely elicit mental health history, prior trauma, and social context to facilitate heightened awareness for PICS-related mental health complications and to direct treatment where necessary.[29]

Trauma patients are frequently screened for mental health conditions as part of standardized trauma protocols; however, these screening approaches should be evaluated for usability and effectiveness in identifying patients at risk for PICS-related outcomes.[31] Notably, the injury severity score has not been consistently associated with the incidence of PICS-related mental health complications.[30 32] Additionally, patients with anxiety, depression, or PTSD symptoms may have difficulty participating fully in rehabilitation and accurately reconstructing their ICU experience.[32 33]

ICU-related exposures represent a major and partially modifiable domain of risk. Delirium, among the strongest predictors of long-term cognitive and psychological morbidity, is often driven by prolonged sedation, mechanical ventilation, or the use of benzodiazepines.[28] Environmental and procedural stressors, sleep fragmentation, sensory deprivation, uncontrolled pain, the use of physical restraints, and limited communication or orientation cues disrupt cognitive processing and contribute to fear, disorientation, and later intrusive memories.[29] Clinical instability requiring vasopressors or prolonged immobilization, along with unplanned surgeries, reoperations, septic episodes, or shock, adds further layers of perceived threat and physiological burden, reinforcing the cycle of stress and vulnerability.[32] Minimal family interaction exacerbates emotional isolation and increases the risk of psychological sequelae.[7] ICU teams should actively minimize modifiable risk factors by minimizing deep sedation, avoiding benzodiazepines, optimizing analgesia, promoting sleep, and facilitating early mobilization and family engagement.[33]

After discharge, post-ICU stressors frequently sustain or aggravate mental health symptoms. Many survivors experience persistent physical disability or poor functional recovery, which undermines independence and leads to frustration, hopelessness, or depressive symptoms.[34 35] Financial hardship, job loss, unstable housing, and medical debt impose chronic stress that compounds psychological distress.[34 35] At the same time, family members or caregivers may experience burnout or emotional exhaustion, creating a bi-directional strain that worsens patient outcomes.[36 37] Finally, a lack of structured follow-up or fragmented transition of care leaves many survivors without early recognition or support for emerging psychiatric symptoms, allowing mild distress to evolve into chronic, debilitating mental health disorders.[9 11 38 39] Figure 1 depicts the risk factors that contribute to PICS mental health outcomes. For the many reasons described, clinicians should routinely assess functional status, financial stressors, and caregiver burden after ICU discharge and actively link survivors and families to rehabilitation, social work, and mental health services as part of comprehensive PICS risk mitigation.[7 28]

Question

What steps can an intensivist take to mitigate PICS-related mental health impairments in surgical and trauma patients?

Recommendation

Key opportunities for intensivists to mitigate PICS-related mental health morbidity include reducing delirium and distressing ICU experiences while preserving orientation, mobility, and continuity of the patient experience. An intensivist can meaningfully reduce PICS-related mental health morbidity in surgical and trauma patients by the following interventions: (1) minimization of modifiable contributors to delirium and traumatic memory

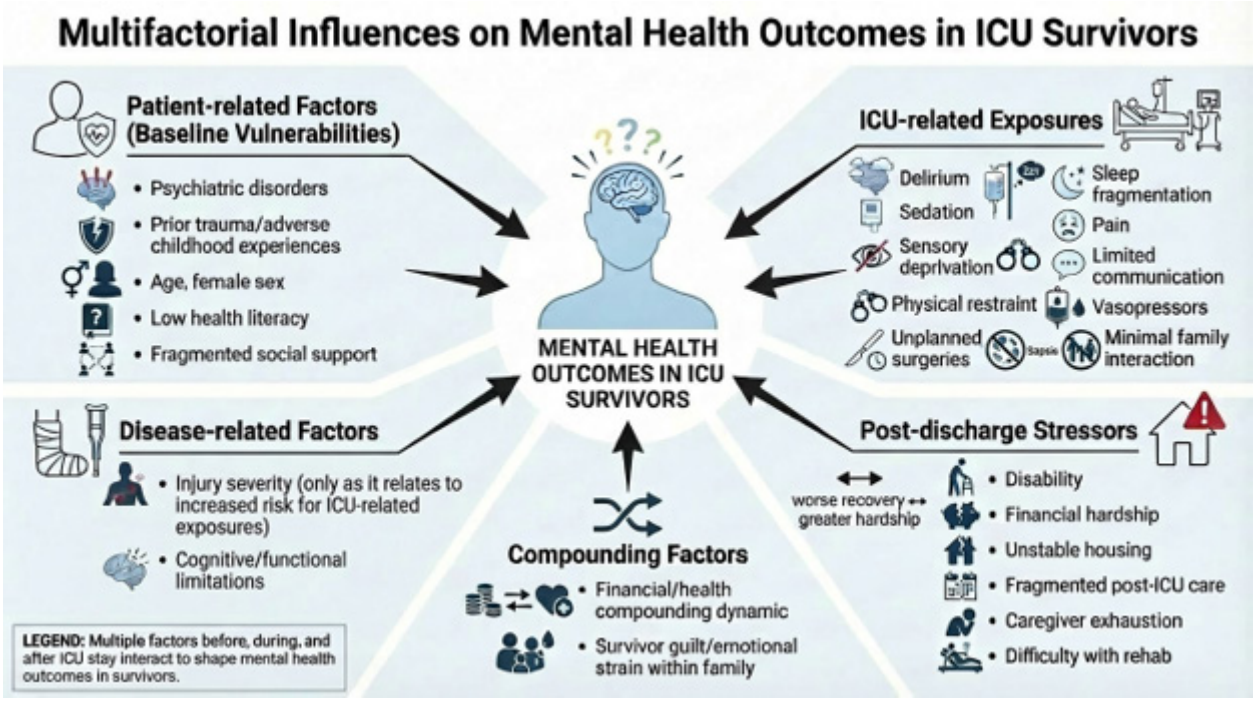


Figure 1 Factors influencing mental health outcomes in ICU survivors. ICU, intensive care unit.

formation through implementation of evidence-based ICU care practices; (2) early mobilization and preservation of physical function; (3) systematic pain assessment and management consistent with the ICU Liberation (ABCDEF bundle, also known as the ICU Liberation bundle); (4) communication strategies that promote patient and family understanding, engagement, and psychological support; (5) use of ICU diaries when feasible as part of a structured recovery program; and (6) structured transitions of care and post-ICU recovery programs to facilitate longitudinal follow-up and early identification of psychological symptoms.

DISCUSSION

Mitigation of PICS-related mental health complications requires a structured framework that organizes interventions into major thematic domains, each supported by specific actionable measures. Intensivists oversee the continuum of care from ICU admission through recovery, and targeted strategies across these domains can significantly reduce both short-term and long-term psychological morbidity.[39] The framework below outlines key intervention themes and their operational measures (table 1). Although no single intervention completely prevents psychological morbidity after critical illness, several evidence-based practices have been associated with improved cognitive, psychological, and functional outcomes among ICU survivors.

The greatest opportunity for prevention of mental health impairments occurs during the ICU stay through systematic reduction of modifiable risk factors for delirium and psychological distress. Implementation of the ICU Liberation bundle (ie, ABCDEF bundle)—*A*ssess, prevent, and manage pain, *B*oth sponatenous awakening trials (SATs) and spontaneous breathing trials (SBTs), Choice of analgesia and sedation (minimize sedation and avoid benzodiazepines whenever possible), assess, prevent, and manage *D*elirium, *E*arly mobility and exercise, and *F*amily engagement and empowerment—is recommended to reduce delirium, oversedation, pain, and deconditioning that contribute to later psychological sequelae.[9 11 28] Patients with severe critical illness, including sepsis, acute respiratory distress syndrome, respiratory failure, and hypoperfusion states, are at increased risk for PICS based on the exposures to the ICU-related risk factors in the ICU due to prolonged ventilation, deeper sedation, and longer ICU stays, increasing exposure to factors such as hypoxia, delirium, and distressing or delusional experiences.[21] Adherence to evidence-based care bundles may mitigate these risks by reducing both the frequency and duration of such exposures.

Early recognition of delirium and psychological distress represents an important component of prevention and mitigation. Routine screening with validated tools such as the Confusion Assessment Method for the ICU or the Intensive Care Delirium Screening Checklist should be standard practice, given the strong association between delirium and long-term cognitive and mental health outcomes.[9 11 28 40] The clinical team led by the ICU physician is responsible for making the diagnosis of delirium where appropriate, and for interceding for pain and acute distress/agitation using a pain-first approach, an approach named 'analgosedation' — analgesia first.

In trauma and surgical ICU populations, an analgesia-first approach does not imply inadequate pain control or avoidance of analgesic therapy. Rather, light sedation should not be equated with light analgesia. Effective management of pain and acute distress requires proactive, multimodal strategies that address the source of pain while minimizing unnecessary exposure to sedative medications. These strategies may include regional anesthesia techniques, non-opioid adjunctive therapies, non-pharmacologic interventions, early mobilization, and injury-specific interventions when appropriate. For patients with significant injuries or complex procedural needs, early involvement of specialized teams, including anesthesia, burn, surgical, and rehabilitation specialists, may help optimize procedural tolerance, functional recovery, and patient experience. Anticipatory planning and expert management of painful interventions, including wound care and operative procedures, are essential components of reducing avoidable distress and supporting recovery after critical illness.

Table 1 Tiered framework for mitigating PICS-related mental health sequelae

Main theme	Objectives	Measures (actionable steps)	Evidence basis
Prevention within the ICU	Minimize exposure to harmful ICU stressors and promote early physiological and psychological stabilization	Implement the ABCDEF bundle (also knows as the ICU Liberation bundle).	Evidence-supported ICU practice[64]; PICS-specific benefit not definitively established
		Limit deep sedation and avoid benzodiazepines	Evidence-supported ICU practice[65]; associated with reduced delirium and improved ICU outcomes
		Maintain sleep hygiene (circadian cues, noise reduction, clustered care).	Evidence-informed[65]; limited direct evidence for PICS prevention
		Provide frequent reorientation and clear communication.	Evidence-informed[65]; supported for delirium prevention and patient-centered care
		Use multimodal, opioid-sparing analgesia.	Evidence-supported pain management strategy[66]; long-term PICS impact remains uncertain
		Initiate early mobilization and rehabilitation.	Evidence-supported ICU practice[66]; improves functional outcomes, with variable PICS-specific evidence
		Encourage structured family presence and engagement.	Evidence-informed[65]; variable evidence for long-term psychological outcomes
Early identification and screening	Detect cognitive, psychological, and behavioral risks during ICU stay	Perform routine delirium screening (CAM-ICU, ICDSC).	Evidence-supported ICU practice[65]; screening recommended by consensus guidelines
		Screen high-risk patients for anxiety, depression, and PTSD symptoms.	Expert consensus; benefit depends on access to evaluation and treatment
		Monitor for red flags (panic, nightmares, dissociation, severe agitation).	Expert consensus; clinically informed risk identification
		Consider psychiatry or psychology consultation for severe or persistent psychological/behavioral disturbances beyond expected ICU recovery, including refractory agitation, psychotic symptoms, self-harm behaviors, or expressed need for psychological support.	Expert consensus; referral thresholds remain incompletely defined
Communication and expectation setting	Reduce uncertainty, fear, and catastrophic thinking	Provide consistent and empathetic communication with patients and families.	Evidence-informed[67]; associated with improved patient and family experience
		Establish realistic functional and recovery expectations.	Expert consensus; supported by principles of patient-centered care
		Use ICU diaries to support memory reconstruction and reduce PTSD risk.	Emerging evidence[67]; mixed results across studies
Structured transition of care	Ensure continuity of monitoring and support post-ICU	Provide structured discharge planning with summaries of ICU course.	Expert consensus; evidence for PICS-specific outcomes limited
		Educate patients and families on expected symptoms and recovery trajectory.	Expert consensus; low-risk patient-centered intervention
		Refer patients to post-ICU clinics, rehabilitation services, and mental-health resources.	Emerging evidence[22]; optimal care models remain undefined
		Arrange early follow-up (within 2 weeks to 4 weeks after discharge).	Expert consensus; optimal timing requires further study
Multidisciplinary and psychosocial support	Address psychosocial, emotional, and socioeconomic stressors that influence recovery	Engage psychology, psychiatry, social work, physical therapy and occupational therapy (PT/OT), chaplaincy, and case management.	Expert consensus; multidisciplinary models vary by institution
		Identify and mitigate financial hardship early with social services.	Evidence-informed[54]; limited intervention-specific outcome data
		Provide caregiver education, stress-management tools, and access to support networks.	Evidence-informed[67]; caregiver burden interventions remain heterogeneous

Evidence basis definitions: *evidence-supported* recommendations are informed by consistent evidence from clinical studies, guidelines, or established ICU practices, although the strength and direct applicability to PICS outcomes may vary. *Evidence-informed* recommendations are supported by available data, mechanistic rationale, or related clinical outcomes but lack definitive evidence demonstrating direct impact on PICS-related outcomes. *Emerging evidence* refers to interventions for which preliminary data suggest potential benefit, but further investigation is required to define effectiveness, implementation, or patient populations most likely to benefit. *Expert consensus* recommendations reflect the clinical judgment and collective experience of the committee in areas where high-quality evidence remains limited or unavailable.
CAM-ICU, Confusion Assessment Method for the Intensive Care Unit; ICDSC, Intensive Care Delirium Screening Checklist; PICS, post-intensive care syndrome; PTSD, post-traumatic stress disorder.

High-risk patients should also be monitored for emerging anxiety, depression, and acute stress symptoms to facilitate timely support, education, and referral when clinically indicated.[28 41] Although psychological distress, sleep disruption, anxiety, and agitation are common among critically ill patients, routine psychiatric consultation for all ICU survivors is neither feasible nor supported by current evidence. The committee recommends targeted consultation for patients with psychological or behavioral symptoms that are disproportionate to the expected ICU experience, persist despite optimization of pain control, sedation, delirium management, and other reversible contributors, or interfere with recovery. Examples include persistent agitation despite appropriate delirium evaluation and management, psychotic symptoms, self-harm behaviors, severe emotional distress, or patients who express a desire for additional psychological support when screened for recovery concerns.

It is important to recognize that many psychological and behavioral symptoms encountered in the ICU may also arise from medication effects, delirium, withdrawal, neurologic injury, or other manifestations of critical illness. For example, psychotic symptoms may be medication-associated, including related to agents such as ketamine, whereas agitation or behavioral changes may reflect traumatic brain injury or other acute neurologic conditions. Therefore, consultation decisions should incorporate careful clinical assessment and optimization of reversible ICU, and/or injury-related contributors while evaluating for the need for specialized psychological or psychiatric support. In parallel, communication and expectation setting are central to reducing fear and catastrophic thinking. Consistent, empathetic updates using clear language, along with realistic descriptions of the expected recovery trajectory, help patients and families contextualize their experiences and reduce distress.[28] Family engagement should also be encouraged whenever feasible, as inclusion of family members in communication, decision-making, and recovery planning may improve understanding of the critical illness experience and provide emotional support for both patients and caregivers.

ICU diaries may be considered as an adjunctive intervention to support memory reconstruction and reduce psychological distress associated with fragmented or delusional recollections of critical illness. These diaries typically contain entries from clinicians and family members that document important events during the ICU stay. When reviewed after discharge with appropriate clinical support, ICU diaries may help survivors place their experiences into context and mitigate post-traumatic stress symptoms in selected patients.[11 28]

Structured transitions of care are essential after ICU discharge. Providing patient-centered, comprehensible summaries of the ICU course, educating patients and families about PICS, and arranging early follow-up (within 2 weeks to 4 weeks) can facilitate timely recognition and management of emerging symptoms and provide opportunities for timely care.[28] Patients and families should receive education regarding common physical, cognitive, and psychological sequelae of critical illness, as well as guidance regarding when to seek additional evaluation. Whenever feasible, follow-up within a dedicated ICU recovery or PICS clinic may provide opportunities for ongoing assessment, symptom monitoring, and multidisciplinary care coordination.

Taken together, these interventions emphasize that prevention and mitigation of PICS-related mental health impairment begin during critical illness but require continued attention throughout recovery. Intensivists play a critical role in reducing modifiable risk factors, supporting patients and families during hospitalization, and facilitating transitions to longitudinal recovery services that address the evolving psychological consequences of critical illness.

Question

What non-financial effects does PICS have on family members and caregivers of surgical and trauma patients, and how can intensivists help recognize and mitigate this burden?

Recommendation

Family members and caregivers of ICU survivors commonly experience significant non-financial morbidity, including anxiety, depression, post-traumatic stress symptoms, caregiver burden, and role strain, reduced quality of life, anticipatory and complicated grief, and disruptions in family dynamics. Strategies to mitigate these effects include: (1) a multidisciplinary, family-centered approach throughout the ICU stay and care transitions; (2) routine screening for psychological distress, along with clear, consistent communication, and meaningful inclusion of family members in care and decision-making; and (3) consistent, compassionate communication that includes early integration of palliative care when needed.

DISCUSSION

The impact of PICS often extends beyond the individual patient, causing significant emotional, psychological, physical, and socioeconomic distress for family members and caregivers of ICU survivors.[42] This phenomenon, referred to as PICS-F, has become increasingly recognized as a serious consequence of critical illness and an important target for intervention by intensivists and critical care teams.[43]

Multiple factors contribute to PICS-F, including uncertainty regarding patient outcomes, the emotional burden of participating in clinical decision-making, financial stress related to prolonged illness, and disruption of family roles and daily responsibilities after a patient's ICU admission.[42 43] Dissatisfaction with communication from the healthcare team and limited family involvement in decision-making have also been identified as risk factors for the development of PICS-F.[44 45] Studies suggest that up to 69% of family members exhibit clinically significant psychological symptoms, including anxiety, depression, and symptoms consistent with PTSD, in the months after ICU admission.[46 47] The severity and duration of these symptoms are often influenced by the course of the patient's recovery.

Recognition of PICS-F begins with acknowledging that family members and caregivers represent a high-risk population for psychological morbidity during and after critical illness. Intensivists and critical care teams play a central role in identifying caregivers who exhibit signs of emotional distress, caregiver strain, anxiety, depression, or maladaptive coping throughout the ICU stay and recovery period.

Providing consistent, transparent communication about the patient's condition, prognosis, and care plan is one of the key strategies for reducing the risk of PICS-F.[43] The involvement of facilitators including social workers, palliative care, or family support coordinators during family meetings may further improve caregiver satisfaction with communication and care, particularly when communication is coordinated and aligned across disciplines.[43 48] As previously discussed, the use of ICU diaries has been shown to improve communication and provide families with a structured narrative of the ICU experience but has not consistently been shown to improve PICS-F symptoms.[49]

Intensivists are encouraged to facilitate family presence and participation in aspects of ICU care. Flexible visitation policies and opportunities for family members to attend interdisciplinary rounds can improve understanding of the patient's condition and help prepare families for the transition from ICU care to recovery.[48] When palliative care consultation is indicated, early integration with the primary ICU team is recommended to ensure consistent messaging, shared decision-making, and coordinated support for patients and families. Discordant communication between teams may increase confusion, distress, and dissatisfaction among family members. It is important to adapt communication to the needs of families, as many interventions that prevent PICS-F rely on improving understanding and satisfaction through effective communication. In this context, the Society of Critical Care Medicine recommends relaxing visitation restrictions, which may help reduce the risk of PICS-F.[43]

Current evidence does not support routine referral to a PICS clinic solely for prevention or mitigation of PICS-F; however, future multidisciplinary interventions may alter this recommendation as additional data emerge.[49] Clearly explaining diagnoses and impairments to families can help them access appropriate support and resources and is therefore recommended. This communication should occur throughout the continuum of care and be tailored to individual needs and health literacy levels.[50] Peer support may be effective for PICS-F, although additional evidence is needed.[51] Family members and caregivers should be assessed for psychological distress throughout the continuum of care, with particular emphasis during the ICU stay and major care transitions. When distress is identified, caregivers should be connected with available support services, including counseling resources, educational materials, caregiver training, social work services, and community-based support programs.[43]

In addition to routine ICU care, families are supported through enhanced communication, social work involvement, psychological first aid from bedside staff (including chaplains), peer support, opportunities for respite through 'permission to leave' for rest and self-care, and environmental modifications that promote privacy and comfort.[52] Based on identified needs, caregivers should also be offered referral for evaluation and treatment of anxiety, depression, and post-traumatic stress symptoms through appropriate healthcare settings, including primary care, mental health services, or community-based programs.[51]

Taken together, these findings emphasize that PICS-F is a common and clinically significant consequence of critical illness that may persist long after hospital discharge. Effective mitigation requires early recognition, consistent communication, caregiver engagement, psychosocial support, and longitudinal assessment throughout the recovery process.

Question

What strategies can providers use to identify and mitigate financial hardship in surgical and trauma patients who develop PICS?

Recommendation

We recommend that surgical and trauma ICU patients at risk for financial hardship related to PICS should be screened for financial strain using structured, multidomain assessments of cost burden, employment impact, insurance status, and access to resources (eg, the American Association for the Surgery of Trauma Health Economics Committee 'Financial Five'). Providers should incorporate efforts to mitigate preventable drivers of cost, including adherence to evidence-based ICU practices and the Society of Critical Care Medicine (SCCM) ICU Liberation bundle to reduce complications and optimize ICU length of stay. Finally, hospitals and health systems should ensure access to financial counselors and social workers, integrated across inpatient care, outpatient clinics, and community-based resources, to support identification of needs and navigation of financial challenges during recovery.

DISCUSSION

The term 'financial toxicity' has been extensively used in the oncological field to refer to the out-of-pocket expenses related to patients' care that diminish their quality of life.[53] Since then, the idea that medical care has the potential to cause financial hardship has been further studied and explored. For reasons that include the generation of confusion and guilt for patients and their families, the term 'financial toxicity' has largely been replaced by 'financial hardship'.[54] Financial hardship can be conceptualized across three domains: material hardship, psychosocial stress, and adverse coping behaviors.[54 55] Material hardship refers to medical expenses (such as a hospital bill), non-medical expenses (household bills), and income loss due to acute injury or illness. Psychosocial stress refers to the uncertainty surrounding patients' or family's financial future and a general lack of financial security. Negative coping behaviors involve avoidance or delay of further recommended medical care out of fear of further material hardship.

Financial hardship has been increasingly studied in both acute care surgery and critical care populations. However, there is little evidence describing the epidemiology of financial hardship of surgical critical care patients. Trauma and emergency general surgery patients are particularly prone to financial hardship after their hospital course as they often lack the ability to anticipate the inciting event and do not have a choice of where they receive care. This can lead to the inability to appropriately plan for important considerations such as time off work, preparations for paying bills, finding childcare, and supporting their family while they are away. Additionally, patients who suffer traumatic injuries tend to be younger and thus do not have the accumulated wealth or larger support networks that older patients might have that can help support them through their hospitalization and recovery.[54] Furthermore, intensive care stays can be quite expensive, with one study demonstrating that out-of-pocket spending for ICU hospitalization is increasing, and the cost of health-related resources ranges from US$26 730 to US$210 545 in the first post-ICU year.[56] Joblessness is also common after critical illness, with approximately half of previously employed survivors remaining unemployed at 1 year.[57–59] Insurance status (high deductible or uninsured), race (non-white), parents with children under age 10 years, baseline financial insecurity, victims of interpersonal violence, and limited social support have all been associated with increased financial hardship after trauma or critical illness.[40 60–62] Importantly, financial hardship and health outcomes appear to have a bidirectional relationship. Patients experiencing greater financial hardship often experience worse health outcomes, whereas individuals requiring more intensive medical care may be at increased risk of developing financial hardship.[40] This relationship suggests that financial hardship should be considered both a consequence of critical illness and a potential contributor to poorer long-term recovery.[40] As such, financial hardship is an important topic for our surgical critical care patients that needs to be addressed early.

The process for screening should begin while patients are in the intensive care setting, especially for patients who are deemed high risk, including but not limited to younger working patients, lower-income patients, uninsured or those with high-deductible plans, victims of interpersonal violence, non-white patients, and patients with children under age 10 years.[62] We recommend using the AAST Health Economics Committee's 'Financial Five' questions to evaluate the five domains of financial hardship.[54] Although originally developed for trauma patients, we think that this survey can be easily applied to patients in the surgical ICU (table 2). For those patients who are identified as being high risk, open discussions between the patients, caregivers, and providers about cost, financial concerns, and care should be encouraged.[63] Furthermore, financial counselors and social workers can provide necessary resources to patients and families to help navigate this difficult time.

Finally, providers should ensure that they use evidence-based practices to minimize patients' time in the ICU until and avoid potential complications associated with prolonged ICU stays. These include ensuring care progresses appropriately—such

Table 2 The American Association for the Surgery of Trauma (AAST)'s 'Financial Five' questions to evaluate the five domains of financial hardship[54]

Financial hardship domain	Financial hardship element	Question stem	Answers
Material hardship	Medical bills	In the last 4 weeks, have you had any problems paying or were you unable to pay any medical bills related to your critical illness?	No; yes; I have not received a bill yet
	Non-medical expenses	In the last 4 weeks, have you had any problems paying or were you unable to pay for any non-medical expenses such as food, housing, transportation, utilities, or regular monthly bills?	No; yes
	Household income loss	How does your household's current monthly income compare to what it was before your critical illness?	Less than before my illness; about the same; more than before my illness
Psychosocial stress	Future financial worry	Currently, how worried are you about money problems in the future because of your critical illness and recovery?	Not worried; somewhat worried; very worried
Coping behaviors	Affordability-related care delays	In the last 4 weeks, have you ever delayed or not gotten medical care because you were worried about the cost or could not afford it?	No; yes

as extubating patients from ventilators as soon as they meet criteria, avoiding deliriogenic medications, and initiating therapies as early as feasible—while also making a conscientious effort to actively move patients toward their next stage of recovery.

Although many determinants of financial hardship are not directly modifiable by intensivists, early recognition, proactive screening, resource navigation, and prevention of avoidable complications represent important opportunities to mitigate the downstream economic consequences of critical illness.

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