Understanding and Managing Anxiety Sensitivity During Critical Illness and Long-Term Recovery

By Leanne M. Boehm, PhD, RN, ACNS-BC, Claire M. Bird, PhD, Ann Marie Warren, PhD, Valerie Danesh, PhD, RN, Megan M. Hosey, PhD, Joanne McPeake, PhD, MSc, BN(Hons), Kelly M. Potter, PhD, RN, Han Su, PhD, RN, Tammy L. Eaton, PhD, MSc, RN, FNP-C, and Mark B. Powers, PhD

Anxiety sensitivity is a fear of symptoms associated with anxiety (eg, rapid respiration and heart rate, perspiration), also known as "fear of fear." This fear is a misinterpretation of nonthreatening symptoms as threatening across 3 domains: physical ("When my heart rate increases, I'm afraid I may have a heart attack"), social ("If people see me perspire, I fear they will negatively evaluate me"), and cognitive ("When I feel these symptoms, I fear it means I'm going crazy or will lose control and do something dangerous like disconnect my IV"). These thoughts stimulate the sympathetic nervous system, resulting in stronger sensations and further catastrophic misinterpretations, which may spiral into a panic attack. Strategies to address anxiety sensitivity include pharmacologic and nonpharmacologic interventions. In intensive care unit settings, anxiety sensitivity may be related to common monitoring and interventional procedures (eg, oxygen therapy, repositioning, use of urine collection systems). Anxiety sensitivity can be a barrier to weaning from mechanical ventilation when patients are uncomfortable following instructions to perform awakening or breathing trials. Fortunately, anxiety sensitivity is a malleable trait with evidence-based intervention options. However, few health care providers are aware of this psychological construct and available treatment. This article describes the nature of anxiety sensitivity, its potential impact on intensive care, how to assess and interpret scores from validated instruments such as the Anxiety Sensitivity Index, and treatment approaches across the critical care trajectory, including long-term recovery. Implications for critical care practice and future directions are also addressed. (*American Journal of Critical Care.* 2023;32:449-457)

Anxiety sensitivity is the fear of experiencing symptoms and sensations associated with anxiety.[1,2] Conceptually, anxiety sensitivity is the intolerance or catastrophic appraisal of anxiety-related sensations, which then serves to exacerbate such sensations, leading, in turn, to maladaptive escape and avoidance behaviors.[2] Thus, anxiety sensitivity is an essential factor in the experience of psychological distress and related maladaptive behaviors, including those that may be detrimental to health.[3,4]

Anxiety sensitivity is a significant predictor of psychopathology and related maladaptive behaviors.[2] Meta-analyses have provided strong support for the relationship between anxiety sensitivity and anxiety-related disorders, particularly posttraumatic stress disorder (PTSD), panic disorder, and suicidal ideation.[5,6] Anxiety sensitivity has also been linked to chronic illness (eg, asthma, cardiovascular disease, chronic pain) and problematic health behaviors (eg, nonmedical benzodiazepine use, tobacco use, lower exercise engagement, medication nonadherence).[2,4,7-10] Not only do these consequences cause distress and impairment in those with anxiety sensitivity, but they

CE 1.0 Hour

This article has been designated for CE contact hour(s). See more CE information at the end of this article.

This article is followed by an *AJCC* Patient Care Page on page 458.

doi:https://doi.org/10.4037/ajcc2023975

> Anxiety sensitivity may lead to a patient avoiding activities feared to increase anxiety-related sensations (eg, physical therapy).

also increase the burden on the health care system, as anxiety sensitivity is associated with increased emergency room visits and other health care use.[11] Because anxiety sensitivity is associated with multiple negative individual and organizational outcomes, it is considered an important psychological and behavioral condition shared across different types of health disorders (ie, a transdiagnostic factor).

Anxiety sensitivity is applicable to acute and critical illness when the patient experiences unpleasant sensations such as pain, shortness of breath, nausea, and thirst. Although the role of anxiety sensitivity has been examined less in individuals with critical illness than in other populations, higher anxiety sensitivity may lead the critically ill patient to avoid activities that are feared to potentially increase anxiety-related sensations, thereby affecting the delivery of critical care interventions (eg, physical or occupational therapy, repositioning, and weaning from sedatives or mechanical ventilation). After critical illness, the patient may disengage from follow-up services owing to fear of revisiting distressing feelings associated with the intensive care unit (ICU) admission, decline to participate in physical therapy because of a fear of pain, or not report symptoms of post–intensive care syndrome such as anxiety, depression, and PTSD for fear of being negatively perceived by others.

It is important for ICU clinicians to adopt strategies to differentiate a "true alarm," or sensations that require medical intervention, from a "false alarm," or anxiety symptoms that require a psychological intervention. For instance, patients having difficulty with weaning from mechanical ventilation should undergo a detailed workup to search for underlying medical causes (eg, upper airway resistance, cardiac dysfunction, diaphragmatic insufficiency) before anxiety sensitivity is identified as the primary cause. Moreover, fear and anxiety commonly result from ICU delirium, which should be ruled out or managed before the patient is diagnosed with and treated for anxiety sensitivity, as delirium precludes the patient's proper understanding of circumstances and learning new information. In this review, we explore the concept of anxiety sensitivity across the trajectory of critical care, propose a role for ICU clinicians in the identification and management of anxiety sensitivity through the use of strategies to engage patients and care partners, and discuss future directions for critical care research.

Overview of Anxiety Sensitivity

Anxiety sensitivity has been described as a fear of anxiety symptoms that incorporates false beliefs about the harmfulness of such symptoms.[12] Just as individual susceptibility to anxiety varies (one person may become anxious with minimal provocation, whereas another may do so only under the most stressful circumstances), so does susceptibility to anxiety sensitivity. An individual's sensitivity to anxiety plays a key role in the maintenance of anxiety-related disorders (eg, panic disorder, social anxiety disorder) and avoidance behaviors (eg, substance abuse, social withdrawal, declining medical interventions). Meta-analytic reviews have demonstrated strong associations between anxiety sensitivity and anxiety-related disorders, particularly panic disorder and PTSD.[5,13] The domains

About the Authors

Leanne M. Boehm is an assistant professor, Vanderbilt University School of Nursing, Nashville, Tennessee; and an investigator, Critical Illness, Brain Dysfunction, and Survivorship (CIBS) Center, Vanderbilt University Medical Center, Nashville, Tennessee. **Claire M. Bird** is a postdoctoral fellow, Baylor University Medical Center, Dallas, Texas. **Ann Marie Warren** is a research center director, Trauma Research Center, Baylor Scott & White Research Institute, Dallas, Texas; and an adjunct professor, Texas A&M University College of Medicine, Bryan. **Valerie Danesh** is a research investigator, Center for Applied Health Research, Baylor Scott & White Research Institute; and an assistant professor, Baylor College of Medicine, Temple, Texas. **Megan M. Hosey** is an assistant professor, Division of Pulmonary and Critical Care Medicine, and the Department of Physical Medicine and Rehabilitation, Johns Hopkins University School of Medicine, Baltimore, Maryland. **Joanne McPeake** is a research fellow, The Healthcare Improvement Studies Institute, University of Cambridge, Cambridge, United Kingdom. **Kelly M. Potter** is a research assistant professor, Clinical Research, Investigation, and Systems Modeling of Acute Illness (CRISMA) Center in the Department of Critical Care Medicine, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania. **Han Su** is an assistant professor, Vanderbilt University School of Nursing; and an investigator, CIBS Center, Vanderbilt University Medical Center, Nashville, Tennessee. **Tammy L. Eaton** is an associate investigator, VA Health Services Research & Development, Center for Clinical Management Research, VA Ann Arbor Health System, Ann Arbor, Michigan. **Mark B. Powers** is a research center director, Trauma Research Center, Baylor Scott & White Research Institute, Dallas, Texas; and an adjunct professor, Texas A&M University College of Medicine, Bryan.

Corresponding author: Leanne M. Boehm, PhD, RN, ACNS-BC, 461 21st Ave S, 419 Godchaux Hall, Nashville, TN 37240 (email: leanne.boehm@vanderbilt.edu).

> A patient may express being afraid of having a heart attack or being unable to breathe, people noticing or evaluating them negatively, losing control of one's mind, becoming a burden on family members, being unable to work, or dying alone.

of anxiety sensitivity (physical, social, and cognitive concerns) are also differentially associated with anxiety-related disorders. For example, the physical concern dimension of anxiety sensitivity is associated with panic disorder and health anxiety, whereas the cognitive concern dimension has been found to be greater among those with comorbid PTSD and generalized anxiety disorder.[14,15]

In the Zvolensky framework,[2] anxiety sensitivity serves as an intensifying factor in interpreting physiologic responses (eg, increased heart rate, tachypnea) in combination with cognitive catastrophizing (eg, "This must mean I am having a heart attack"), leading to exacerbation of anxiety and panic. Research on the assessment and treatment of anxiety sensitivity is expanding to address the implications of treating the disorder in the context of anxiety and highly distressing situations.

Identifying Anxiety Sensitivity

Anxiety sensitivity is most often measured using the validated Anxiety Sensitivity Index (ASI) and, most recently, the ASI-3.[1,16] The ASI-3 is an 18-item scale that addresses physical, cognitive, and social concerns individuals may have regarding their anxiety. Each item is scored from "very little" to "very much." Higher scores indicate greater anxiety sensitivity, with a score of 18 or lower indicating very little fear of anxiety-related sensations. Below are ASI-3 statements with examples of related thought and behavior patterns.

Physical Concern. It scares me when my heart beats rapidly. Example: "I'm having a heart attack."

Cognitive Concern. It scares me when I am unable to keep my mind on a task. Example: "I'm afraid I will forget what I am doing and fall, so I tell the physical therapist I don't want to stand."

Social Concern. I worry that other people will notice my anxiety. Example: "When I get scared and short of breath, I'm afraid people are going to notice and not take my medical problem seriously."

During hospitalization for critical illness, observable signs of anxiety sensitivity may include asynchrony with the ventilator, tachypnea, tachycardia, or expressions of anxiety or agitation in the absence of physiologic explanations. Patients may also require significant staff time. Similarly, during long-term recovery from critical illness, patients with anxiety sensitivity may need increased assessment time, extra explanation and demonstration before participating in physical therapy, and reassurance of safety when experiencing physical discomfort. When asked about fears during the phase after critical illness, a patient may express being afraid of having a heart attack or being unable to breathe, people noticing or evaluating them negatively (particularly in relation to previously independent activities such as toileting), losing control of one's mind (especially in those who experienced delirium), becoming a burden on family members, being unable to work, or dying alone.

Factors Contributing to Anxiety Sensitivity

Four concepts underpin the etiology of anxiety sensitivity. First, genetics may contribute to the condition, with a heritability estimate of 45%.[17,18] Second, parental responses to childhood illness or injury may reinforce attending to and misinterpreting anxiety symptoms.[19] Third, a history of unexpected panic attacks increases the likelihood of anxiety sensitivity.[20,21] Finally, stressful life events are associated with anxiety sensitivity.[18,22]

Critical Illness and Anxiety Sensitivity

Patients with critical illness frequently experience anxiety and fear due to a heightened volume and intensity of physiologic cues and other stressors, with nearly 50% of ICU patients having clinically significant anxiety symptoms during their ICU stay.[23] Common stressors during critical illness and hospitalization include loss of control and independence, pain, delirium, sensory deprivation, social isolation, and imminent death. Physiologic symptoms such as breathlessness, fatigue, procedural and positional pain, and dizziness associated with hypotension may be viewed by patients as potentially deadly, rather than strange but expected features of recovery. Invasive medical procedures such as mechanical ventilation and placement of indwelling urinary catheters, chest tubes, intravenous catheters, and other tethers can trigger significant anxiety and

“Because of the prevalence of anxiety sensitivity across mental health disorders, treatments targeting anxiety sensitivity are widely applicable to treatments for depression, PTSD, and panic disorder.”

thus pose special challenges for patients with anxiety sensitivity. Finally, several medications that play important roles in critical care, including steroids and vasopressors, may be associated with increased anxiety and agitation.[24] These symptoms may be greatly exacerbated in patients with premorbid anxiety sensitivity.[25,26]

Experiencing a critical illness itself commonly induces fear. Critically ill patients have one or more complex acute and chronic health conditions (eg, organ failure, diabetes, heart disease) requiring close monitoring of physiologic changes, medications, and diet. In addition, patients may associate physiologic changes with past experiences requiring hospitalization. For example, if a patient experienced an increased heart rate just before receiving a shock with an internal defibrillator, they may associate heart rate changes with intense fear of another shock, causing them to avoid behaviors resulting in heart rate changes. In a study of patients with chronic obstructive pulmonary disease, after accounting for depression and anxiety, physical symptoms associated with anxiety sensitivity were significant predictors of disease symptom exacerbations and an increased incidence of emergency room visits and hospitalizations.[27]

After hospitalization, ICU survivors often struggle with anxiety and PTSD.[28] Some patients report not wanting to leave the hospital for fear of getting sick again, and others describe not seeking important medical care to avoid reminders of hospitalization. The physical distress, loss of control, and disorientation associated with critical illness can manifest as long-term physical and psychological trauma and vulnerability. Stressors in the context of new or worsening chronic conditions during long-term ICU recovery may include physical deconditioning, cognitive impairment, depression, medication access challenges, increased health care use, and use of durable medical equipment.[29] Potential anxiety sensitivity triggers may include sounds (eg, microwave timers that sound like ventilator alarms), nightmares, changes in voice or swallowing due to laryngeal injuries from endotracheal intubation, or the need for mobility aids (eg, cane, walker) to resume walking. Surviving an ICU stay often involves psychological, cognitive, and physical difficulties as patients and care partners navigate the implications of recovery and face the need for adaptations for the patient to resume pre–critical illness activities and routines.[30,31]

Traditional Approaches to Managing Anxiety Sensitivity

Anxiety sensitivity has been found to be not only an integral aspect of many anxiety and mood disorders but, specifically, a strong mediator and mechanism of change in treatment outcomes, indicating that it should be considered a treatment target.[32,33] Anxiety sensitivity has been shown to improve with treatment for a diagnosed mental health disorder, such as cognitive behavior therapy (CBT) for panic disorder.[34,35] Because of the prevalence of anxiety sensitivity across mental health disorders, treatments targeting anxiety sensitivity are widely applicable to treatments for multiple mental health concerns, such as depression, PTSD, and panic disorder.

Brief structured treatments for individuals with high anxiety sensitivity at risk for the development of psychopathology have shown promising results.[31,34,36] Anxiety sensitivity–specific treatment drawn from traditional CBTs includes psychoeducation, cognitive restructuring, interoceptive exposure, and situation exposure.[35,37] The Unified Protocol for Transdiagnostic Treatment of Emotional Disorders has also been used to treat anxiety sensitivity, with interoceptive exposure highlighted as the most effective component.[38] Psychoeducation focuses on normalizing anxiety and its related sensations, whereas interoceptive exposure involves intentionally inducing anxiety-related sensations to demonstrate to the patient that experiencing these sensations will not lead to catastrophic outcomes.[39] Cognitive bias modification is an intervention that prompts individuals to focus on positive information and experiences rather than negative experiences that give rise to anxiety sensitivity. Treatment for anxiety sensitivity in an ICU setting (ie, psychological first aid) is different from that in traditional outpatient settings involving formal psychiatric diagnosis (eg, CBT for panic disorder). Whereas traditional CBT often occurs in 8 to 12 sessions, brief treatment for anxiety sensitivity may be implemented

Table 1
Anxiety sensitivity crisis interventions

Activation criteria	Intervention
Hyperarousal (eg, tachycardia, diaphoresis, restlessness)	Verbal reassurance of safety Assessment of family/visitor involvement (presence or absence) Medication management (eg, anxiolytics, antidepressants) Nurse providing a calming presence Assessment and changes to reduce external stimuli (eg, lighting, visitors) Use of short, simple directions Providing reassurance of physiologic status Avoiding asking the patient to make decisions
Hyperventilation when not receiving mechanical ventilation	Coaching patient to close their mouth to inhale and exhale from their nose Coaching patient through paced breathing counts (inhale 3 seconds and exhale 5 seconds) for 3 minutes with instructions for the patient to self-pace and continue the exercise Medication management (eg, sedatives, anxiolytics, antidepressants)
Panic during mobilization	Adequate pain management Coaching and reassurance during physical therapy Breaking mobility activities into small steps (eg, step 1 for walking is to push off with walker, now shift your weight to the front leg, next bring your back foot forward, and so on)

in as little as 1 session.[36] Treatments for anxiety sensitivity have shown efficacy in reducing not only anxiety sensitivity but also smoking, alcohol and opioid use, anxiety and depression symptoms, and suicidal ideation.[37,40-43] Assessment tools such as the ASI-3 can be used to identify the primary domain of anxiety sensitivity distress (physical, social, or cognitive) to help tailor treatment.

Implications for Critical Care Practice

Although methods for the assessment and management of anxiety during the critical illness trajectory are well established,[26] research specific to anxiety sensitivity is limited. Further investigation is needed of clinical implications and interventions during and after critical illness. Patients with anxiety sensitivity may experience increased distress when undergoing medical interventions, such as mechanical ventilation or invasive procedures, which can trigger fears of experiencing the physical symptoms of anxiety. Therefore, ICU clinicians should be aware of patients' possible anxiety sensitivity so that they can use clear communication and implement pain management or relaxation techniques to mitigate distress and improve patient outcomes.

Managing Anxiety Sensitivity in the Inpatient Setting

A thorough medical evaluation is typically necessary to differentiate between anxiety sensitivity and other medical conditions. Anxiety sensitivity can coexist with other medical conditions, and in some cases the physical symptoms may be caused or exacerbated by anxiety. Therefore, a comprehensive evaluation in which both physical and psychological factors are considered is often necessary for effective symptom management. However, communication barriers due to mechanical ventilation and delirium can inhibit assessment of anxiety sensitivity with validated tools during critical illness. Therefore, management relies largely on reducing stressors through environmental modification to minimize anxiety sensitivity triggers.

Providing basic psychoeducation to ICU patients on common physiologic and psychological symptoms may temper anxiety sensitivity. For example, the clinician can tell the patient, "It's normal to feel scared when you are short of breath. You are getting better, so this shortness of breath is typical and uncomfortable, but not deadly."[44] It can also help to provide education about ICU delirium and the process of resolution as well as reassurance that this is not a new, permanent psychiatric condition. Helping patients identify aspects of recovery within their control may reduce anxiety and increase engagement during critical illness (eg, timing of physical therapy, type of music played, communication tools used).

Nurse-Led Strategies During Critical Illness. Evidence-based strategies for reducing stressors and minimizing anxiety sensitivity triggers include family visitation and involvement to reduce social isolation, adjusting sensory stimuli to promote a comfortable and calming environment (eg, reducing noise levels), promoting sleep-wake balance, fostering clear and timely communication, and music therapy.[45,46] When a patient is experiencing an anxiety sensitivity crisis and is in need of more urgent intervention, psychological first aid can be provided (Table 1). Psychological first aid helps the patient to feel safe, connected, and supported through practical and emotional assistance.[47] Psychological first aid may include assuring the patient of their safety, listening actively to concerns, using

Table 2
Content for psychoeducational materials about anxiety sensitivity

Domain	Educational content
Definition	Fear of anxiety-related sensations or symptoms; a belief that these sensations are dangerous and their presence indicates something harmful is happening
Physiology	Description of sympathetic nervous system response
Causes	Genetics, early life experiences, exposure to trauma or stressful life events Common feature of anxiety disorders (eg, panic disorder, social anxiety disorder, generalized anxiety disorder)
Effect on daily life	Avoidance of situations that trigger symptoms Interferes with social, occupational, academic functioning Contributes to development of anxiety disorders
Treatment options	Descriptions of Psychological first aid Cognitive behavior therapy (eg, cognitive restructuring, exposure) Psychotherapy Mindfulness practices Medication
Coping strategies	Relaxation exercises, meditation, physical activity, social support
Lifestyle changes	Avoiding caffeine, alcohol, and nicotine
Self-care	Encourage hobbies, creative outlets, self-compassion
Support resources	Mental health professionals, support groups, online resources

calming techniques such as hand-holding or breathing exercises, or providing distraction. For example, if a patient is hyperventilating, the nurse can suggest that they close their mouth, as it is very difficult to hyperventilate with a closed mouth. If time permits, the patient can be coached in paced breathing (eg, inhale for 3 seconds and exhale for 5 seconds) for 3 minutes. These activities can provide the patient with an added sense of control.

Family Engagement Strategies During Critical Illness. Family engagement for managing anxiety sensitivity requires awareness of anxiety sensitivity, its triggers, and how to recognize and manage patient symptoms. Family members can be encouraged to help identify root issues (eg, tubes, catheters, loss of control, previously feared triggers) and provide information on ICU treatments and equipment to help the patient gain a sense of control. They can also provide important information about what helps the patient feel safe and relaxed in their day-to-day life (eg, music preferences, relaxing touch, pleasurable activities). In some cases, family members may be encouraged to bring in comforting or familiar objects from home. Moreover, those who are interested can take an active role in patient care by helping with basic activities of daily living (eg, grooming) and physical therapy (eg, range-of-motion exercises), which may provide the patient with a sense of comfort and familiarity.[48,49] Family members can also work with ICU clinicians and patients to set goals for ICU treatment and recovery to ensure collaborative decision-making and patient empowerment.

Managing Anxiety Sensitivity During Critical Illness Recovery

Psychological first aid offered during inpatient hospitalization is not a long-term solution for anxiety sensitivity. Patients may be fearful that the breathing exercises practiced during hospitalization will not work after hospital discharge. After robust physical assessments are performed to rule out any ongoing physiologic issues, ICU recovery clinics and peer support programs can incorporate anxiety sensitivity assessment and management to promote patients' overall well-being. Within the multidisciplinary ICU recovery clinic or peer support setting, psychoeducation can be provided about the nature and causes of anxiety and panic. Psychologists or social workers embedded in ICU recovery programs can describe how the sympathetic nervous system is triggered, causing changes to occur in the body that are designed to alert the person to danger and protect them from harm. This sympathetic response is meant to feel uncomfortable for the purpose of motivating the individual to act, and is akin to a fire alarm that alerts one to leave the building. Content areas for psychoeducation materials are described in Table 2. Given that anxiety was one of the few objective constructs that did not improve in recent research on the effectiveness of a complex intervention for ICU survivors,[50] the integration of anxiety sensitivity assessment and management may be crucial for future practice in this area.

Interoceptive exposure is a CBT technique in which the patient is deliberately exposed to bodily

Table 3
Cognitive modification exemplars

Situation	Sensation	Thought/stuck point	Thought challenge	Alternative thought
Physical therapy	Lightheaded/short of breath	I'll pass out, fall, and seriously injure myself. Feels 80% likely.	How many times have you felt lightheaded or short of breath? How many times when you felt this way did you fall and seriously injure yourself? What is the likelihood of getting hurt during physical therapy from 0 (none) to 100 (absolute)?	I'm safe. My brain is setting off an alarm. This isn't comfortable, but it is also not harmful. The doctors have told me it is anxiety from hyperventilation, and this actually makes it less likely I will pass out. My physical therapist can help me.
Walking to the bathroom	Heart racing	I'll have a heart attack. Feels 70% likely.	How many times have you noticed your heart racing? How many times when you felt this way have you had a heart attack? What are some other reasons for your heart to be racing?	There are several reasons for my heart to be racing. The doctors said I do not have a heart condition. It is likely caused by activity, the coffee I had this morning, or anxiety. This does not mean I am having a heart attack. I will take a few deep breaths before deciding if I should call a doctor.

sensations associated with anxiety sensitivity triggers in a controlled and gradual manner to reduce fear and anxiety.[39] Through this exposure, the patient can better differentiate between true and false alarms and therefore know when a hospital visit is warranted versus when the symptoms are due to anxiety. For each anxiety sensitivity sensation, different exposures can be simulated (eg, hyperventilation, tachycardia), when not contraindicated, to trigger anxiety sensitivity and perform in-the-moment cognitive modification (Table 3). The brain knows that the sensation is due to anxiety, but the limbic system does not. The interoceptive exposure process can help the patient acknowledge that the amygdala set off an alarm, but also that the patient (1) is afraid of having a heart attack, (2) is not having a heart attack, and (3) is not dead.

Research and Practice Priorities for Anxiety Sensitivity and Critical Illness

Critical care research needs related to anxiety sensitivity across inpatient and outpatient settings include measurement and intervention development. Population-level incidence and prevalence reports are needed to interpret the significance of anxiety sensitivity in the critical illness trajectory. Risk factors for anxiety sensitivity may include the types of invasive tubes and catheters used, sleep disruption, characteristics of acute illness, and ongoing biological mechanisms such as hyperinflammation. Assessment measures could be pilot tested for validity and acceptability with ICU patients and survivors and used in tandem with qualitative description of the patient experience of anxiety sensitivity and what helps to reduce symptoms. Protocolized intervention methods are needed to establish cause-and-effect relationships for patient-centered anxiety sensitivity management, with corresponding feasibility studies to assess implementability, safety, and efficacy. Longitudinal studies examining interventions are warranted to evaluate short- and long-term efficacy. Addressing anxiety sensitivity research priorities could improve outcomes for individuals with anxiety sensitivity during and after critical illness. Last, education and dissemination of knowledge are fundamental to increasing clinician awareness and assessment of anxiety sensitivity during and after critical illness.

Conclusion

Understanding the prevalence and characteristics of anxiety sensitivity in ICU survivors is crucial to improving their experience of critical care. A "fear of fear" can amplify anxiety during all stages of the critical illness trajectory, from ICU admission through long-term recovery. Accurate detection and effective interventions in the inpatient and outpatient settings are integral to comprehensive critical care. Future research should incorporate anxiety sensitivity assessment and management techniques across the critical care recovery continuum.

ACKNOWLEDGMENTS
The contents of this article are solely the responsibility of the authors and do not necessarily represent the views of the Department of Veterans Affairs (VA), the US government, or the National Institutes of Health (NIH).

FINANCIAL DISCLOSURES
Dr Danesh was supported by the National Institute on Aging, NIH (R21AG080339). Dr Hosey was supported by the Parker B. Francis Foundation and the National Heart, Lung, and Blood Institute, NIH (K23HL155735). Dr McPeake was supported by a fellowship from The Healthcare Improvement Studies Institute, University of Cambridge (PD-2019-02-16). Dr Potter was supported by the National Heart, Lung, and Blood Institute, NIH (T32 HL007820). Dr Eaton acknowledges support from the VA Office of Academic Affiliations

through the VA National Clinician Scholars Program (NCSP) and University of Michigan Medicine at the University of Michigan.

REFERENCES

1. Reiss S, Peterson RA, Gursky DM, McNally RJ. Anxiety sensitivity, anxiety frequency and the prediction of fearfulness. *Behav Res Ther.* 1986;24(1):1-8. doi:10.1016/0005-7967(86)90143-9
2. Smits J, Otto M, Powers M, Baird S. *The Clinician's Guide to Anxiety Sensitivity Treatment and Assessment.* Academic Press; 2018.
3. Otto MW, Eastman A, Lo S, et al. Anxiety sensitivity and working memory capacity: risk factors and targets for health behavior promotion. *Clin Psychol Rev.* 2016;49:67-78. doi:10.1016/j.cpr.2016.07.003
4. Alcantara C, Edmondson D, Moise N, Oyola D, Hiti D, Kronish IM. Anxiety sensitivity and medication nonadherence in patients with uncontrolled hypertension. *J Psychosom Res.* 2014;77(4):283-286. doi:10.1016/j.jpsychores.2014.07.009
5. Olatunji BO, Wolitzky-Taylor KB. Anxiety sensitivity and the anxiety disorders: a meta-analytic review and synthesis. *Psychol Bull.* 2009;135(6):974-999. doi:10.1037/a0017428
6. Stanley IH, Boffa JW, Rogers ML, et al. Anxiety sensitivity and suicidal ideation/suicide risk: a meta-analysis. *J Consult Clin Psychol.* 2018;86(11):946-960. doi:10.1037/ccp0000342
7. McHugh RK, Geyer R, Karakula S, Griffin ML, Weiss RD. Nonmedical benzodiazepine use in adults with alcohol use disorder: the role of anxiety sensitivity and polysubstance use. *Am J Addict.* 2018;27(6):485-490. doi:10.1111/ajad.12765
8. Reuven SM, Chen TA, Zvolensky MJ, Businelle MS, Kendzor DE, Reitzel LR. Examining the moderating effect of anxiety sensitivity on past-month pain severity and heaviness of smoking among adult smokers experiencing homelessness. *Addict Behav.* 2021;112:106610. doi:10.1016/j.addbeh.2020.106610
9. Galbraith MK, DeWolfe CEJ, Bartel S, Olthuis JV, Watt MC, Stewart SH. Do anxiety sensitivity and impulsivity interact in predicting exercise involvement in emerging adult drinkers and cannabis users? *Cogn Behav Ther.* 2022;51(3):243-256. doi:10.1080/16506073.2021.1998211
10. Zvolensky MJ, Smit T, Rogers AH, et al. Exploring pain experience and anxiety sensitivity among Latinx adults in a federally qualified health center. *J Behav Med.* 2022;45(3):404-415. doi:10.1007/s10865-022-00325-2
11. Horenstein A, Rogers AH, Bakhshaie J, Zvolensky MJ, Heimberg RG. Examining the role of anxiety sensitivity and intolerance of uncertainty in the relationship between health anxiety and likelihood of medical care utilization. *Cogn Ther Res.* 2019;43(1):55-65.
12. Taylor S. Anxiety *Sensitivity: Theory, Research, and Treatment of the Fear of Anxiety.* Routledge; 2014.
13. Naragon-Gainey K. Meta-analysis of the relations of anxiety sensitivity to the depressive and anxiety disorders. *Psychol Bull.* 2010;136(1):128-150. doi:10.1037/a0018055
14. Baek IC, Lee EH, Kim JH. Differences in anxiety sensitivity factors between anxiety and depressive disorders. *Depress Anxiety.* 2019;36(10):968-974. doi:10.1002/da.22948
15. Wheaton MG, Deacon BJ, McGrath PB, Berman NC, Abramowitz JS. Dimensions of anxiety sensitivity in the anxiety disorders: evaluation of the ASI-3. *J Anxiety Disord.* 2012;26(3):401-408. doi:10.1016/j.janxdis.2012.01.002
16. Taylor S, Zvolensky MJ, Cox BJ, et al. Robust dimensions of anxiety sensitivity: development and initial validation of the Anxiety Sensitivity Index-3. *Psychol Assess.* 2007;19(2):176-188.
17. van der Walt K, Campbell M, Stein DJ, Dalvie S. Systematic review of genome-wide association studies of anxiety disorders and neuroticism. *World J Biol Psychiatry.* 2023;24(4):280-291. doi:10.1080/15622975.2022.2099970
18. Peel AJ, Oginni O, Assary E, et al. A multivariate genetic analysis of anxiety sensitivity, environmental sensitivity and reported life events in adolescents. *J Child Psychol Psychiatry.* 2023;64(2):289-298. doi:10.1111/jcpp.13725
19. Casline E, Patel ZS, Timpano KR, Jensen-Doss A. Exploring the link between transdiagnostic cognitive risk factors, anxiogenic parenting behaviors, and child anxiety. *Child Psychiatry Hum Dev.* 2021;52(6):1032-1043. doi:10.1007/s10578-020-01078-2
20. Schmidt NB, Lerew DR, Joiner TE Jr. Prospective evaluation of the etiology of anxiety sensitivity: test of a scar model. *Behav Res Ther.* 2000;38(11):1083-1095. doi:10.1016/s0005-7967(99)00138-2
21. Li W, Zinbarg RE. Anxiety sensitivity and panic attacks: a 1-year longitudinal study. *Behav Modif.* 2007;31(2):145-161. doi:10.1177/0145445506296969
22. McLaughlin KA, Hatzenbuehler ML. Stressful life events, anxiety sensitivity, and internalizing symptoms in adolescents. *J Abnorm Psychol.* 2009;118(3):659-669. doi:10.1037/a0016499
23. May AD, Parker AM, Caldwell ES, et al. Provider-documented anxiety in the ICU: prevalence, risk factors, and associated patient outcomes. *J Intensive Care Med.* 2021;36(12):1424-1430. doi:10.1177/0885066620956564
24. Savas M, Vinkers CH, Rosmalen JGM, et al. Systemic and local corticosteroid use is associated with reduced executive cognition, and mood and anxiety disorders. *Neuroendocrinology.* 2020;110(3-4):282-291.
25. Bienvenu OJ, Friedman LA, Colantuoni E, et al. Psychiatric symptoms after acute respiratory distress syndrome: a 5-year longitudinal study. *Intensive Care Med.* 2018;44(1):38-47. doi:10.1007/s00134-017-5009-4
26. Nikayin S, Rabiee A, Hashem MD, et al. Anxiety symptoms in survivors of critical illness: a systematic review and meta-analysis. *Gen Hosp Psychiatry.* 2016;43:23-29. doi:10.1016/j.genhosppsych.2016.08.005
27. Witcraft SM, Dixon LJ, Leukel P, Lee AA. Anxiety sensitivity and respiratory disease outcomes among individuals with chronic obstructive pulmonary disease. *Gen Hosp Psychiatry.* 2021;69:1-6. doi:10.1016/j.genhosppsych.2020.12.004
28. Langerud AK, Rustøen T, Småstuen MC, Kongsgaard U, Stubhaug A. Intensive care survivor-reported symptoms: a longitudinal study of survivors' symptoms. *Nurs Crit Care.* 2018;23(1):48-54. doi:10.1111/nicc.12330
29. Boehm LM, Danesh V, Eaton TL, et al. Multidisciplinary ICU recovery clinic visits: a qualitative analysis of patient-provider dialogues. *Chest.* 2023;163(4):843-854. doi:10.1016/j.chest.2022.10.001
30. Eaton TL, Lewis A, Donovan HS, et al. Examining the needs of survivors of critical illness through the lens of palliative care: a qualitative study of survivor experiences. *Intensive Crit Care Nurs.* 2023;75:103362. doi:10.1016/j.iccn.2022.103362
31. Hunt C, Campbell-Sills L, Chavira D, et al. Prospective relations between anxiety sensitivity and transdiagnostic anxiety following cognitive-behavioral therapy: evidence from the Coordinated Anxiety Learning management trial. *Behav Res Ther.* 2022;155:104119. doi:10.1016/j.brat.2022.104119
32. Asnaani A, Tyler J, McCann J, Brown L, Zang Y. Anxiety sensitivity and emotion regulation as mechanisms of successful CBT outcome for anxiety-related disorders in a naturalistic treatment setting. *J Affect Disord.* 2020;267:86-95.
33. Gallagher MW, Payne LA, White KS, et al. Mechanisms of change in cognitive behavioral therapy for panic disorder: the unique effects of self-efficacy and anxiety sensitivity. *Behav Res Ther.* 2013;51(11):767-777.
34. Smits JA, Berry AC, Tart CD, Powers MB. The efficacy of cognitive-behavioral interventions for reducing anxiety sensitivity: a meta-analytic review. *Behav Res Ther.* 2008;46(9):1047-1054.
35. Taylor S. Treating anxiety sensitivity in adults with anxiety and related disorders. In: Smits JAJ, Otto MW, Powers MB, Baird SO, eds. *The Clinician's Guide to Anxiety Sensitivity Treatment and Assessment.* Elsevier; 2019:55-75.
36. Schmidt NB, Capron DW, Raines AM, Allan NP. Randomized clinical trial evaluating the efficacy of a brief intervention targeting anxiety sensitivity cognitive concerns. *J Consult Clin Psychol.* 2014;82(6):1023.
37. Worden BL, Davis E, Genova M, Tolin DF. Development of an anxiety sensitivity (AS) intervention for high-AS individuals in substance use disorders treatment. *Cogn Ther Res.* 2015;39(3):343-355.
38. Boswell JF, Farchione TJ, Sauer-Zavala S, Murray HW, Fortune MR, Barlow DH. Anxiety sensitivity and interoceptive exposure: a transdiagnostic construct and change strategy. *Behav Ther.* 2013;44(3):417-431.
39. Schmidt NB, Allan NP, Knapp AA, Capron D. Targeting anxiety sensitivity as a prevention strategy. In: Smits JAJ, Otto MW, Powers MB, Baird SO, eds. *The Clinician's Guide to Anxiety Sensitivity Treatment and Assessment.* Elsevier; 2019:145-178.
40. Paulus DJ, Brandt CP, Lemaire C, Zvolensky MJ. Trajectory of change in anxiety sensitivity in relation to anxiety,

depression, and quality of life among persons living with HIV/AIDS following transdiagnostic cognitive-behavioral therapy. *Cogn Behav Ther.* 2020;49(2):149-163.
41. Zvolensky MJ, Rosenfield D, Garey L, et al. Does exercise aid smoking cessation through reductions in anxiety sensitivity and dysphoria? *Health Psychol.* 2018;37(7):647-657.
42. Capron DW, Norr AM, Zvolensky MJ, Schmidt NB. Prospective evaluation of the effect of an anxiety sensitivity intervention on suicidality among smokers. *Cogn Behav Ther.* 2014;43(1):72-82.
43. Raines AM, Short NA, Allan NP, Oglesby ME, Schmidt NB. Examination of a brief anxiety sensitivity cognitive concerns intervention on suicidality among individuals with obsessive-compulsive symptoms. *Contemp Clin Trials.* 2015;45(pt B):191-195.
44. Spathis A, Burkin J, Moffat C, et al. Cutting through complexity: the Breathing, Thinking, Functioning clinical model is an educational tool that facilitates chronic breathlessness management. *NPJ Prim Care Respir Med.* 2021;31(1):25. doi:10.1038/s41533-021-00237-9
45. Richard-Lalonde M, Gélinas C, Boitor M, et al. The effect of music on pain in the adult intensive care unit: a systematic review of randomized controlled trials. *J Pain Symptom Manage.* 2020;59(6):1304-1319.e6. doi:10.1016/j.jpainsymman.2019.12.359
46. Luetz A, Grunow JJ, Mörgeli R, et al. Innovative ICU solutions to prevent and reduce delirium and post–intensive care unit syndrome. *Semin Respir Crit Care Med.* 2019;40(5):673-686.
47. Everly Jr GS, Lating JM. *The Johns Hopkins Guide to Psychological First Aid.* Johns Hopkins University Press; 2022.
48. Haines KJ, Kelly P, Fitzgerald P, Skinner EH, Iwashyna TJ. The untapped potential of patient and family engagement in the organization of critical care. *Crit Care Med.* 2017;45(5):899-906. doi:10.1097/CCM.0000000000002282
49. Burns KEA, Misak C, Herridge M, Meade MO, Oczkowski S; Patient and Family Partnership Committee of the Canadian Critical Care Trials Group. Patient and family engagement in the ICU: untapped opportunities and underrecognized challenges. *Am J Respir Crit Care Med.* 2018;198(3):310-319. doi:10.1164/rccm.201710-2032CI
50. Henderson P, Quasim T, Shaw M, et al. Evaluation of a health and social care programme to improve outcomes following critical illness: a multicentre study. *Thorax.* 2023;78(2):160-168.

CE 1.0 Hour Category A

Notice to CE enrollees:

This article has been designated for CE contact hour(s). The evaluation demonstrates your knowledge of the following objectives:

1. Describe anxiety sensitivity and its impact on critical care patients, including avoidance behaviors and influence on health outcomes.
2. Describe 4 key factors contributing to the etiology of anxiety sensitivity and the relationship to comorbid mental health conditions.
3. Describe effective strategies for managing anxiety sensitivity in critical care practice.

To complete the evaluation for CE contact hour(s) for activity A2363, visit https://aacnjournals.org/ajcconline/ce-articles. No CE fee for AACN members. See CE activity page for expiration date.

The American Association of Critical-Care Nurses is accredited as a provider of nursing continuing professional development by the American Nurses Credentialing Center's Commission on Accreditation, ANCC Provider Number 0012. AACN has been approved as a provider of continuing education in nursing by the California Board of Registered Nursing (CA BRN), CA Provider Number CEP1036, for 1.0 contact hour.