

noted by the authors, the diverse nature of the children included in the study with respect to the severity of their condition and functional abilities may also have influenced the shared decision-making process for families and health care providers.

Edwards and colleague's qualitative study is the first to evaluate the LTV decision-making process from the perspective of family caregivers' decisional needs (10). It provides novel evidence to support the importance of providing comprehensive,

balanced information to families in a compassionate manner when considering LTV for their child. The timing of such information also appears crucial, as this study reported on some contemporaneous decision-makers who felt communication was not timely enough, and others who felt pressured to make a decision. Future research is required to determine how best to operationalize these difficult conversations, including when the most appropriate time is to start these conversations, as well as the

optimal frequency and content of subsequent discussions. This study demonstrates that health care providers need to inform, respect, empower, and partner with family caregivers and their children being considered for LTV to foster successful shared decision making and ensure the right decision is being made for each child and their family. ■

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# Reducing the Effect of Critical Illness by Continuing to Think beyond the Intensive Care Unit

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For many patients, critical illness begins before the intensive care unit (ICU) (1, 2). Recognizing that prompt identification and treatment might avert patient deaths,

clinicians, scientists, and policymakers have directed considerable resources toward the development and implementation of treatment bundles, early warning systems, quality measures, and other interventions targeting critical illness syndromes in their golden hours (3–7). Although these advances have contributed to improved patient outcomes, both short-term mortality and long-term morbidity remain high.

In this issue of *AnnalsATS*, Weissman and colleagues (pp. 81–88) ask whether some episodes of critical illness might be stemmed even earlier, preventing ICU admission or hospitalization altogether (8). To answer this question, the authors evaluate 10 years' worth of inpatient claims drawn from patients with fee-for-service Medicare or a large private payer administering both Medicare Advantage and private insurance plans. In a

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laudable effort, the cohort included a majority of all hospitalizations among adults over the age of 65 years and a sizable proportion of those among younger adults as well. Among members of this cohort admitted to the ICU, the authors categorized admissions as potentially preventable if their primary reason for admission was an ambulatory care sensitive condition (ACSC) or a life-limiting malignancy (LLM).

ACSCs are defined by the Agency for Healthcare Research and Quality as selected inpatient diagnoses “for which good outpatient care can potentially prevent” hospitalization and limit more serious disease (9). These include acute exacerbations and other complications of chronic diseases (including asthma, chronic obstructive pulmonary disease, diabetes mellitus, and congestive heart failure) and infections that may be amenable to early outpatient antibiotics or vaccination (including bacterial pneumonia and urinary tract infection). LLMs, meanwhile, include malignancies associated with high 1-year mortality and few options for curative treatment (10). In prior work, both ACSCs and LLMs have been used as measures of ambulatory care quality and as benchmarks for evaluating both practice- and system-level interventions.

In total, the authors identified nearly 100 million hospitalizations spanning 10 years, including 16 million ICU admissions. Among these, nearly one in six met ACSC or LLM criteria for being potentially preventable. Notably, these were different from discretionary admissions; the extent to

which ICU admissions were driven by bed supply did not differ between these potentially preventable and other ICU admissions, suggesting that they were no more likely to be discretionary than other causes of ICU admission.

A few limitations are worth noting. For one, the estimates of potentially preventable ICU admissions contained in this paper are likely conservative. Definitions of both ACSCs and LLMs are reliant on primary diagnosis codes and were originally designed to categorize hospitalizations more broadly. ICU patients with primary diagnoses of sepsis, respiratory failure, or shock, even as a consequence of an ACSC or LLM, would not qualify. Further, the lists of conditions that qualify leave out many hospitalizations (e.g., those related to substance use disorder) that might be considered ambulatory care sensitive. Finally, the degree to which admissions for ACSCs or LLMs are completely preventable is uncertain: studies evaluating the effects of population-level interventions aimed at improving ambulatory care access and quality have yielded inconsistent results, with even highly successful interventions yielding small absolute decrements in the rates of preventable hospitalizations (11).

Still, these findings are notable for several reasons. First, they suggest that many episodes of critical illness might be averted through improvements to ambulatory care coverage, access, and quality. An implication of this is that the up-front costs associated with these improvements might be at least partially offset by reductions in these high-severity hospitalizations. Future work should focus on identifying who is at highest risk for preventable critical illness and how best to deliver clinical resources to these high-risk patients. At a population level, the state-level variation identified by the authors suggests an opportunity to study how policies and other factors may be effective in reducing rates of preventable critical illness. Such

approaches are supported by prior work demonstrating that the Affordable Care Act’s Medicaid expansion, which was variably adopted across states, may have been effective in reducing respiratory failure (12). There is likely more to be learned mechanistically by examining such regional and state-level variation.

Second, such preventable ICU admissions might be useful for benchmarking health care systems or evaluating health policy where other measures of utilization have fallen short. Because of their high acuity, ICU admissions may be less susceptible to nonclinical factors (e.g., patient and clinician discretion, financial pressures, etc.) than other types of utilization, such as ED visits or hospitalizations (13). This may make them more reliable population-level measures of health, particularly when evaluating complex policy interventions (14).

Beyond pre-ICU care, this study should also lead us to consider that the same coverage, access, or quality constraints likely associated with preventable ICU admissions may affect patients after ICU discharge (15). Many rehospitalizations after conditions such as sepsis and respiratory failure are also caused by potentially preventable diagnoses (16, 17). In addition to preventing many ICU admissions, ambulatory care has great potential to improve clinical trajectories among those surviving critical illness.

Finally, this work suggests we continue to expand traditional temporal and geographic boundaries when considering efforts to combat critical illness (18). The emergency department and hospital ward have been important loci for early interventions aimed at many critical illness syndromes. Considering that the seeds of many such illnesses begin well before a hospitalization grants additional opportunities to meaningfully reduce the effect of critical illness. ■

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## Passing the Baton: Improving Postsepsis Care through Better Transitions

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In 2008, the U.S. women’s 4 × 100 m relay team entered the Beijing Olympics as one of the favorites to win the gold medal. True to form, the U.S. was the top seed entering the semifinal race after posting the top two fastest times in qualifying. Heading into the final 100 m, the U.S. women led, but botched the exchange, dropping the baton to the ground. They finished a full 6 seconds behind the winner, marking the first time in 60 years that the U.S. failed to qualify for the Olympic final.

For many years, successful discharge from the intensive care unit (ICU) was seen as the finish line. More than a decade of research, however, has shown that we are dropping the baton for many patients and their families (1). Each year, nearly 14 million adults worldwide are discharged from the hospital having survived sepsis (2–4). Fewer than half experience recovery to their presepsis function. Disabilities in activities of daily

living and impaired cognitive, physical, and mental health function are the norm (3, 5–8). Multiple studies also provide a rich, but disheartening picture of poor quality of life, unemployment, and altered social relationships (9–13). In the years that follow, these survivors face an increased risk of mortality and are frequently readmitted to the hospital (2, 14).

The emerging knowledge of life after sepsis hospitalizations highlights the importance of transitions of care for these vulnerable survivors, an area of policy focus in an era where providers are more often held accountable for posthospital healthcare utilization. Yet little is known about how best to care for patients who survive sepsis. Randomized trials seeking to improve outcomes have produced mixed data, leaving clinicians to rely in expert recommendations for managing patients after hospitalizations for sepsis (4).

In this issue of *AnnalsATS*, Taylor and colleagues (pp. 89–97) studied the frequency with which expert-recommended postsepsis care elements

were provided to patients from a single health system in the southeastern United States (15). The authors reviewed charts for the presence of four components of postsepsis care: optimization of medications, screening for common impairments, anticipation and monitoring for common preventable causes of health deterioration, and treatment aligned with patient preferences. They then measured the association between provision of these elements with a composite outcome of mortality or readmission within 90 days after hospital discharge.

Among the 204 patients included, 11% received all four elements. An equal proportion received none. The most frequent element provided was medication reconciliation, whereas the least frequent element provided was an assessment of swallowing function. Patients who received at least 2 elements had a 74% reduction in the adjusted odds of death or readmission, those who received 3 elements had a 72% reduction, and those who received all 4 had an 88% reduction

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