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Frailty assessment in the ICU: translation to ‘real-world’ clinical practice

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Over the past 10 years, there has been widespread and increasing interest in assessing frailty in the intensive care unit (ICU) [1], yet there is substantial uncertainty about how to reliably measure frailty in a critically ill patient. Frailty has many operational definitions, but broadly represents a state of decreased physiologic reserve that heightens vulnerability to acute stressors [2]. Importantly, frailty is distinct from age, comorbidity, and disability [3]. Frail ICU patients suffer a greater burden of post-discharge disability [4, 5], are more likely to be newly admitted to a nursing home, have higher mortality rates than non-frail patients and experience prolonged recovery from critical illness [6]. As such, recognising frailty in the ICU may help guide clinical decision making for critically ill patients.

Despite its clinical potential, feasibility and validity present two distinct challenges to frailty assessment in the ICU. Well-validated frailty scales such as the Fried Frailty Phenotype [7] were developed in community-dwelling populations, and include measures of grip strength and gait speed that are difficult or impossible to perform in many critically ill patients. Measures such as the Edmonton Frail Scale [8] similarly require assessments of gait and mobility that are usually not feasible in the ICU. Other scales such as the Frailty Index [9] include 70 items and can be burdensome for ICU clinicians to integrate meaningfully into examinations. These feasibility challenges have understandably led the critical care community to shift its interest to subjective frailty assessments that incorporate proxy-based information when necessary. However, subjective, proxy-based assessments may pose a threat to validity due to recall bias, particularly during a critical illness, when the patient is far from their baseline. Thus, any frailty scale being considered for use in the ICU must carefully balance feasibility and validity.

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Clinical Frailty Scale

A recent review of frailty measurement in the ICU found that most studies have used the Clinical Frailty Scale (CFS) [10], a nine-item ordinal scale that was developed to evaluate 'general fitness and frailty' among older adults [11]. In the ICU, the CFS allows for a frailty evaluation in patients who are delirious, sedated, or otherwise unable to meaningfully participate in assessments by drawing information from other sources, including proxy interviews and the medical record. However, using data from multiple sources raises questions of measurement reliability – a valid concern, given the impact a frailty assessment can have on treatment planning for ICU patients. Two previous studies have evaluated reliability of the CFS in the ICU; however, one was limited by small sample size [12] and the second did not evaluate reliability of assessments conducted by physicians [13].

In this issue of *Anaesthesia*, Pugh et al. present results from an inter-rater reliability study of the CFS for 101 ICU patients across seven clinical sites [14]. This study addresses reliability across physicians, and also evaluated agreement of measures between physicians, nurses and physiotherapists – an important consideration given the multidisciplinary nature of patient care in the ICU. This investigation also adds to prior work on the psychometric properties of the CFS [12, 13] by evaluating patient- and clinician-level factors that could indicate personal bias. However, the results highlighted some concerns about using the CFS and its prespecified cut-offs to assess frailty in ICU patients. Although overall agreement between raters was good, score differences of one point were observed in nearly half (47%) of the cases; moreover, score differences were magnified across different disciplines (physicians, nursing and physiotherapy), raising important questions about the inter-rater reliability of the CFS in ICU clinical practice.

Why is frailty important?

To fully appreciate the implications of these findings, we must step back and consider the role of frailty assessment in medicine. The objective of a frailty assessment is to gather information about the patient's baseline state of vulnerability to better understand their risk of adverse outcomes. Thus, the ideal setting for a frailty assessment – and the setting in which most frailty instruments have been validated – is the outpatient setting. Routine frailty assessments in primary care are becoming more common and offer the best opportunity to use frailty information prospectively to inform advance care planning discussions [15]. Frailty assessments have also been successfully implemented in pre-operative and pre-procedural populations to inform risk stratification and clinical decision-making [16, 17]. In an ideal world, the future of frailty assessment in the ICU would not require a frailty assessment in the ICU at all: ICU providers would simply refer to the patient's last outpatient frailty assessment in a seamlessly integrated electronic medical record. They would then draw on this information, in addition to information about baseline functional status and comorbidities, to have an informed advance care planning discussion with patients and families.

Medicine is far from this ideal world of seamless integration, but the goals outlined above can still inform our implementation of frailty assessments in critical care. First, it is

important to reiterate that frailty is distinct from disability and comorbidity, but all are powerful predictors of adverse post-ICU outcomes [4, 18, 19]. If our goal in clinical practice is risk stratification, then risk assessment should include frailty, disability (i.e. dependence in activities essential for independent living), and comorbidity. Although these three conditions are often evaluated independently, it is worth noting that all three are included in how the CFS is used in practice, making it a truly 'global' measure of fitness and vulnerability. Second, despite the strong association of frailty with adverse post-ICU outcomes, no frailty instrument has ever had such good discriminative accuracy that would support its point-of-care use in the emergency department as an ICU triage tool [20]. Third (and assuming a baseline pre-ICU frailty assessment is unavailable), the ideal time for obtaining a frailty assessment during a critical illness hospitalisation remains unclear. Many studies have assessed frailty during the ICU stay [6, 21] but frailty assessments performed before hospital discharge can also help with postdischarge risk stratification [22]. However, it is self-evident that earlier assessments would be necessary if the goal is to integrate frailty status into goals-of-care discussions in the ICU. Finally, despite decades of frailty research, there is no clear consensus in the frailty community on the 'best' frailty assessment tool [23]. This is not to say that we need any new tools; a recent scoping review of frailty assessments identified 89 frailty tools for use in acute care alone [1]. The recommended strategy is to select a validated frailty instrument that can be feasibly and reliably applied in the population of interest.

Frailty assessment in the ICU

In the present ICU setting, our two best options are the CFS or a proxy-based version of the Fried frailty phenotype; both approaches have good (and similar) construct and predictive validity [24]. However, keeping in mind the aforementioned point about discriminative accuracy, it is worth noting that Pugh et al. saw a nearly 10% discordance in classification of patients as frail (CFS > 4) vs. non-frail in their findings. This appropriately raises doubts about using a strict diagnostic cut-off for frailty, particularly when a frailty diagnosis has the potential to impact clinical decision making [25]. To improve specificity, practitioners may consider the full scale of the CFS. For example, rather than using the dichotomous cut-off of a CFS > 4 to identify frailty, scores > 4 could be recategorised into 'possible frailty' (CFS 5–6) and 'probable frailty' (CFS 7–9). The tool could also include a reminder that the CFS should be used as part of a global assessment of the critically ill patient, rather than the sole measure of risk for adverse outcomes. With this approach, it is less likely that a one-point difference in CFS would trigger major changes in clinical care.

Pugh et al. also identified an important incongruence in frailty assessments between clinician groups that suggests more rigorous CFS measurement instructions may be necessary to ensure interdisciplinary standardisation. Disability is part of the CFS tool assessment, and some ICU disciplines (i.e. rehabilitation therapists) routinely perform disability assessments in their clinical practice, whereas other disciplines (physicians and nurses) may not. As such, physicians, nurses and rehabilitation therapists may assess and weigh information about prior disability differently in the absence of standardised instructions. The solution is not to require only one discipline to administer the CFS, but to provide a reproducible algorithm for administration of the tool so that it can be used across

disciplines. To streamline the frailty assessment process, critical care researchers and clinicians may be able to draw from the experiences of the US Center for Disease Control during development of the Stopping Elderly Accidents, Deaths, and Injuries (STEADI) tool [26]. The genesis of STEADI was the realisation that falls and fall-related injuries were common among older adults, but healthcare providers, despite being aware of these concerns, did not have an effective way to complete a meaningful fall assessment. The STEADI development process culminated in a clinical algorithm that laid out three clear sequential steps for clinicians using the tool: (1) patient self-report on key fall-related risk factors; (2) probing clinical questions to follow-up on self-reports and (3) comprehensive clinical assessment of other known fall-risk factors. Future applications of the CFS could use a similar algorithm to standardise frailty assessments and improve inter-rater reliability across medical disciplines.

Conclusions

A critical mass of research supports the value of frailty assessment in the ICU, with great potential to inform clinical decision making in the context of the patient's other risk factors. However, administration of frailty assessments in the ICU presents many challenges, including feasibility in a critically ill patient population, validity of retrospective reports by patients and proxies, discriminative accuracy of the instrument, and inter-rater reliability across medical disciplines. Pugh et al. have taken an important step to improve the rigour of CFS assessments by including a variety of healthcare professionals across seven different hospitals in a robust reliability study. As the field moves towards routine implementation of frailty assessments into ICU (and outpatient) care, addressing these challenges and ensuring excellent inter-rater reliability across multiple disciplines will remain an important goal for frailty assessment in the 'real world' of clinical practice.

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