More Than a Touch of Gray: Embracing Uncertainty in the Intensive Care Unit

James M. Walter, Benjamin D. Singer, and Thomas Corbridge

Division of Pulmonary and Critical Care Medicine, Department of Medicine, Northwestern University Feinberg School of Medicine, Chicago, Illinois

ORCID ID: 0000-0001-5775-8427 (B.D.S.).

It was a sunny Midwest morning at the start of my second year of Pulmonary and Critical Care fellowship as I stood listening to the overnight intern present new admissions to our team. Glancing out the window of our ninth floor intensive care unit (ICU), I could see groups of tie-dyed fans already filling up the city streets in anticipation of the evening's Grateful Dead farewell concert.

Our second patient of the day was a 68-year-old man who was transferred from the inpatient hematology service with shock. He had a history of T-cell leukemia that had progressed despite a stem cell transplantation, and he had recently survived a prolonged admission for acute respiratory distress syndrome that left him with a tracheostomy and dependent on hemodialysis.

With a year of fellowship training behind me, I was expected to lead rounds in the ICU—guide the treatment plan, answer questions from residents, and provide teaching points with each case. However, as the story of our 68-year-old patient unfolded that morning, the confidence I hoped I would feel as a new senior fellow was nowhere to be found. All I felt was uncertainty.

Was this really septic shock although several days of bacterial cultures had been negative, and the patient had worsened despite powerful antimicrobial therapy? Could his rapid atrial fibrillation be contributing to his low blood pressure or was his tachycardia a response to an underlying infection and the norepinephrine running through his port? Did his persistently elevated lactate indicate inadequate tissue oxygenation or was it a marker of his aggressive leukemia?

Over the course of this past year, I have thought a lot about uncertainty in the ICU in part because the confusion I felt that morning never dissipated. The more I looked for certainties in the more than 100 decisions made each day on rounds, the harder they were to find (1). Up to 20% of patients we deem appropriate for liberation from mechanical ventilation develop postextubation respiratory failure and require reintubation (2). Despite numerous clinical trials and the development of novel techniques to assess volume responsiveness, when and how to administer intravenous fluids to critically ill patients remains unclear (3). We rely on imprecise biomarkers to assess tissue perfusion and measure values like plateau pressure, which often poorly reflect the true transmural pressure of interest (4, 5).

As much as we may set strict mean arterial pressure goals, protocolize ventilator weaning, or follow daily checklists, the care plans we create for each patient are filled with unknowns. Too often we ignore this uncertainty. We search for a ventilator dial we can turn or a test we can order to exert some control over a situation we incompletely understand. Although there are numerous reasons to discuss landmark studies on rounds, I often catch myself quoting a trial of tangential relevance to a patient's case in an effort to anchor myself to something known. I may not understand my patient's hemodynamics, but I can at least talk about protocolized sepsis care for a few minutes.

Uncertainty is disorienting and difficult to talk about. Acknowledging its rule over the ICU is in a way an admission of failure—an admission that despite years of training and study, we remain unable to provide answers to many of the day's basic questions. Will our patient's mental status improve? Will his kidney function recover? Will the newly expanded antimicrobial regimen control his infection or pave the way for more resistant bacteria? We can offer an educated guess, but the answer is usually we do not know.

As uncomfortable as it may be to face all of the unknowns of a patient's case, we cheat ourselves by not embracing the uncertainty that travels with us from room to room on rounds. When we focus entirely on laboratory values, echocardiograms, and recently published clinical trials, trainees from fellows to medical students miss an invaluable opportunity: an opportunity to feel comfortable admitting what they do not know, to learn a vocabulary that captures the complexity of the patients they

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Correspondence and requests for reprints should be addressed to James Walter, M.D., Division of Pulmonary and Critical Care Medicine, Department of Medicine, Northwestern University Feinberg School of Medicine, 240 E Huron, McGaw M-300, Chicago, IL 60611. E-mail: james.walter@northwestern.edu

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are caring for, and to marvel at the amount of questions that remain unanswered in critical care. Perhaps most importantly, being able to acknowledge the uncertain is critical to any honest and productive family meeting in the ICU. If we as providers never speak that language with each other, how can we expect to do so with patients and families?

Of course, there is a crucial difference between scientific uncertainty and ignorance (6). The former emerges when we ask difficult questions and willingly confront the limits of our medical knowledge. This type of thinking fosters discussions on rounds and guides novel research. The latter, if it stems from poor preparation, should not be tolerated in any patient care setting.

Despite the near constant presence of uncertainty in ICU decision making, it is the subject of limited high-quality medical research. Although there are numerous studies on patient and surrogate decision-maker comfort with uncertainty, there are few efforts to investigate whether trainees recognize or feel comfortable with medical ambiguity (7, 8). Limited data suggest that intolerance of uncertainty correlates with higher stress levels in medical students, but it is not clear if this relationship holds true for residents, fellows, or attending physicians (9). Thoughtful research outside of medicine has examined how to improve decision-making in the face of uncertainty, but evidence-based strategies to incorporate these approaches into educational curricula for trainees in the ICU are lacking (10).

It is not hard to imagine the benefits of taking a more scientific and energetic approach to uncertainty in the ICU. Efforts on rounds and multidisciplinary conferences that highlight the potential for scientific discovery buried in the unknowns of critical care could generate novel research questions and excite a new generation of physician-scientists. Effectively integrating advances in decision science into educational curricula would almost certainly produce trainees who are more comfortable making decisions with incomplete information and who are better prepared to help patients and their families navigate difficult choices (11). Perhaps most importantly, evidence-based strategies to help providers tolerate and mitigate uncertainty in the ICU may be a way to address the growing problem of burnout in critical care (12).

Almost a year to the day after caring for the 68-year-old patient with leukemia and shock, I again found myself rotating in the ICU. We had just left the room of a 26-year-old man with hypoxemic respiratory failure, the cause of which remained elusive despite an exhaustive workup. As our team gathered around our portable rounding table, I expected our attending to list additional tests to order or perhaps to talk briefly about shunt physiology. Instead, he put down his stethoscope and said, "Wow, I leave every one of these rooms with more questions than answers." This prompted several minutes of discussion about how natural and important it was to acknowledge all of the things we did not understand about the patients on our census. It was a brief moment in a day filled with chest radiographs, arterial blood gases, and ventilator waveforms, but it captured the challenge and thrill of providing care in the ICU more than anything else we did that morning. We should work to ensure these types of moments happen far more frequently. ■

Author disclosures are available with the text of this article at www.atsjournals.org.

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