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Improving Patient Care Through the Prism of Psychology: application of Maslow's Hierarchy to Sedation, Delirium and Early Mobility in the ICU

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Abstract

The Intensive Care Unit is not only a place where lives are saved; it is also a site of harm and iatrogenic injury for millions of people treated in this setting globally every year. Increasingly, hospitals admit only the sickest patients, and, while the overall number of hospital beds remains stable in the U.S., the percentage of that total devoted to ICU beds is rising. These two realities engender a demographic imperative to address patient safety in the critical care setting. This manuscript addresses the medical community's resistance to adopting a culture of safety in critical care with regard to issues surrounding sedation, delirium, and early mobility. Although there is currently much research and quality improvement in this area, most of what we know from these data and published guidelines has not become reality in the day-to-day management of ICU patients. This manuscript is not intended to provide a comprehensive review of the literature, but rather a framework to rethink our currently outdated culture of critical care by employing Maslow's Hierarchy of Needs, along with a few novel analogies. Application of Maslow's Hierarchy will help propel healthcare professionals toward comprehensive care of the whole person, not merely for survival, but toward restoration of pre-illness function of mind, body, and spirit.

Keywords

Critical Care; Psychology; Cognitive Impairment; Rehabilitation; Patient Safety

"A long habit of not thinking a thing wrong, gives it a superficial appearance of being right, and raises at first a formidable outcry in defense of custom."

Thomas Paine, *Common Sense*, 1776

INTRODUCTION

Advances in hospital care have led to greater survivorship from critical illness, with more people leaving the ICU than ever before (is there some type of stat on this?). In the ICU, doctors and nurses are working tirelessly to heal patients' bodies and decrease rates of mortality among their patients. One often-adopted practice is to keep a patient in a state of iatrogenic coma and immobilization rather than allowing them to be conscious and aware of their physical struggles in the ICU. Although this practice is needed for an important minority of patients with the worst hypoxemic respiratory failure on mechanical ventilation, this custom is not necessary for the majority of patients, and in fact is setting them up for long-term cognitive and psychological deficits (ref). Research indicates that these deficits are directly related to this "long habit" of oversedation and immobilization in the ICU (ref). Though the basic, physical needs of the patient are being met and they are able to leave the hospital after their illness, their quality of life and emotional needs are suffering greatly in the months and years afterwards as they encounter long-term cognitive impairment (LTCI)^{31–33}, intensive care unit-acquired weakness (ICU-AW)¹¹, and psychiatric disorders^{32,34–36} like depression and PTSD, all of which appear to be directly related to the ICU stay (ref).

Our goal in this paper is to refresh the way we look at patients in the ICU and how they survive critical illness; physical recovery in the ICU can no longer be our measure of success, but overall quality of life for patients, psychologically and physically, both in *and out of* the ICU, must be our new focus. One model from psychology by Abraham Maslow provides us with a framework to take a second look at our ICU customs, and perhaps, improve the quality of life for our patients. Maslow's basic construct proposes that there are 5 levels of needs (Figure 1A) that must be satisfied in order to promote healthy well-being. The 2 bottom levels of his hierarchy address physiological deficits and associated safety issues, like security and stability, which play an important role in the immediate survival of an individual. The 3 higher levels address psychological needs that include feelings of belonging or love, self-esteem, and self-actualization (i.e., creativity or fulfillment of potential)^{8,37}. For our purposes in looking at ICU Care, once the most basic and physiological needs are met, patients and their families can proceed to concerns regarding psychological and higher ordered needs. Survivorship *physically* is no longer the goal, but rather brain function, happiness, and physical abilities of the patient should all be considered important needs that can be immediately addressed and incorporated into ICU care.^{10–13}

Physiological Needs and Safety, the basic levels of Maslow's Hierarchy, are often the focus of patient care guidelines in current literature. The CDC, the Institute for Healthcare Improvement (IHI), and other large quality improvement programs around the world are bringing key issues regarding patient safety into focus by addressing sedation and early-mobility in the ICU (ref). In 2013, the Society of Critical Care Medicine developed the Pain, Agitation, and Delirium (PAD)² evidence-based guidelines as a way to improve patient care and comfort while also liberating the patient from chemical and physical restraints.

However, despite myriads of data over the past decade speaking to the dangers of oversedation and immobilization, these practices are still prevalent in the ICU². For example, even in delivering mechanical ventilation in a culture of minimal sedation for awake patients^{14,15,51–53}, it is still very common to find ICU studies documenting ongoing high doses of deep sedation and/or high doses of benzodiazepine use in which even protocols do not break that behavior.^{54–56} What often happens is that sedation is stopped in the morning for a brief period of time and then resumed later that day or during the night when the patient begins to wake up and is delirious. The physician on-call or the nurses on duty either will not, cannot, or simply do not spend time dealing with an awake patient,^{56,57} or perhaps operate under the belief that people should not be awake while receiving mechanical ventilation. Though it is of course difficult to change the habits and culture of how we handle the patients in this example, more specific focus on Maslow's second stage, Safety, can help the healthcare team realize that it is safer to let the brain resume normal activity as soon as possible in critical illness and that early mobilization of the patient's brain and body better targets the patient's health needs. Sadly, despite numerous studies and reviews covering the scientific evidence for these innovations, the status quo often remains the same in the ICU.

Atul Gawande wrote in the July 29th issue of the New Yorker on "Slow Ideas: Some innovations spread fast. How do you speed the ones that don't?"³ He noted that such slow adoption of evidence is especially problematic for those problems that are either invisible or those that tend to benefit one party but may seem disadvantageous for the other party. In the ICU, problems like hypoactive "quiet" delirium are often overlooked by critical care teams as it requires proactive steps for its discovery, and then subsequent monitoring and management of the delirium, all of which requires more work for doctors and nurses. Yet, as reviewed in recent publications,^{2,50} researchers have identified acute cognitive dysfunction or delirium as an independent predictor of poor outcomes including duration of mechanical ventilation, discharge disposition, functional and cognitive decline, and mortality rates. By adopting better practices in the ICU, care teams would not only be improving the physiological and safety needs of the patient, but would be setting up a foundation from which the other needs (i.e., Love and Belonging, Esteem, Self-Actualization) could develop and flourish.

The generalized principle of Maslow's Hierarchy of Needs allows for its application in a variety of settings, as has been demonstrated in scientific fields³⁸ and healthcare settings^{39–44} to help foster a culture of change. Nursing continues to be a leading field that has adopted Maslow's ideas in determining care plans and acknowledging patient concerns⁴⁴. Standard hospice and palliative care medicine have also followed similar trajectories by emphasizing patient pain, symptom, and disease management. For example, Zalenski and Raspa⁴⁵ applied Maslow's schema to hospice care and were able to treat distressing symptoms such as pain and dyspnea, physical and emotional fears, as well as provide acceptance and respect in the face of a terminal illness. Emergency medicine⁴³, traumatic brain injury⁴⁷, fall prevention³⁹, hemodialysis⁴⁰, cognitive rehabilitation⁴¹, and severe intellectual disability⁴² have all been influenced by applications of Maslow's schema in the management of patient care and survivorship. Although the validation of Maslow's Hierarchy of Needs has not been conducted with geriatric patients, Majercsik⁴⁶ observed

that geriatric patients rated self-actualization as their primary objective, and physiological pain was rated least important. In addition, there is a long history in the field of psychology effectively informing key aspects of healthcare through theories such as Prochaska's Transtheoretical Model of Behavior Change and Kubler-Ross's Five Stages of Grief.^{48,49} These and other theories have enriched the caring professions of medicine and nursing by offering novel ways of understanding people and the world. Such is the case with perspectives provided by Maslow, which offer a powerful conceptual framework enabling us to understand ICU survivorship better and to tailor optimal interventions to promote better care.

The adaptation of Maslow's Hierarchy of Needs⁸ could serve as a framework for changing the culture of critical care by creating interdisciplinary teams of providers who comprehend and prioritize addressing higher ordered needs associated with patient survivorship. These interdisciplinary teams, which would include physicians, nurses, nurse practitioners, physical therapists, and social workers, would be able to join the patient and their family in a conversation regarding the changing culture of what it means to provide holistic care to the patient (Table 1). A special emphasis on life after the ICU may also help patients and their families, as they develop better awareness of the cognitive, psychological, and physical disturbances that often follow and which often seem unrelated to the patient's hospitalization or illness. After discharge, patients are often immensely debilitated and unable to perform simple physical activities, and they often have ongoing pain and discomfort for an extended period of time.^{10–13} Many patients also experience significant cognitive impairment at discharge, which clinically is of a severity similar to Alzheimer's disease or traumatic brain injury (TBI).^{31–33,58,59} Some of this new disability is often unavoidable after diseases like severe sepsis, but targeting the most likely iatrogenic and modifiable elements of harm should mitigate the post-ICU suffering.

Over the past decade, novel physical and cognitive interventions and practices for critically ill patients have developed, including sedation holidays and SATs/SBTs,^{14,15} delirium monitoring,^{16,17} early mobility and physical rehabilitation,^{18–21} quality end-of-life care (i.e., "good death" protocols),^{22–25} cognitive rehabilitation,²⁶ and post-ICU clinics.^{10,27} Using many of these physical and cognitive interventions, a bundled approach to managing delirium, also known as the **ABCDEs** (found at www.icudelirium.org),^{4–7} was developed for use in the ICU. The ABCDEs stand for **A**wakening trials (spontaneous awakening trials or SATs, a concept ranging from "less sedation" to no sedation), **B**reathing trials (spontaneous breathing trials or SBTs, referring to stopping the ventilator every day to see if it is still required), **C**oordination (between nurses, pharmDs, respiratory therapists, physicians) and **C**hoice (of sedative and analgesics), **D**elirium monitoring and management, and **E**arly mobility and **E**xercise. Such evidence-based approaches⁴ represent opportunities for critical care providers to implement interventions that address patients' needs more holistically. To focus on just one of these areas, for example, early studies have demonstrated the importance of early physical activity and movement in critically ill patients (early mobility, physical and occupational therapy)^{18,60,61} as well as the use of early cognitive rehabilitation training during hospitalization and following discharge^{26,62}.

Cognitive Rehabilitation Following ICU Care

Although the validation of Maslow's Hierarchy of Needs has not been conducted with geriatric patients, Majercsik⁴⁶ observed that geriatric patients rated self-actualization as their primary objective while physiological pain was rated least important. Patient concerns (Table 1) after a critical illness seem to focus on quality of life.

While all of the aspects of Maslow's Hierarchy are relevant to discuss in relationship to specific components in critical care, we will focus the remainder of the paper on the area of cognitive dysfunction and cognitive rehabilitation since it is the most novel aspect of these higher level of components in Maslow's Hierarchy to be considered in critical care management.

Cognitive rehabilitation has been defined in various ways, though Cicerone and colleagues⁶³ have developed a widely utilized definition which posits that it is "the systematic, functionally oriented service of therapeutic activities that is based on assessment and understanding of the patient's brain-behavior deficits." Cognitive rehabilitation is based on 2 fundamental principles – 1) that the brain has the capacity to recover from insult or injury (to a greater or lesser degree) and 2) that individuals have the potential to adjust and adapt to the effects of brain damage, resulting in more effective coping⁶⁴. While the "promise" of plasticity and spontaneous recovery may provide reason for optimism for some brain injured individuals, it clearly applies more to some circumstances than others, and depends on a number of factors such as the age of the individual and the timing of rehabilitation⁶⁵. Brain plasticity is strongly influenced by age as reflected in numerous rodent studies which demonstrate that younger animals have substantial neuronal changes in response to behavioral stresses in contrast to older animals whose brains remain essentially unchanged.⁶⁶ Similarly, plasticity is time dependent as relatively large changes occur in the first weeks and months following brain injury, but they gradually dissipate over time.⁶⁵ On the basis of these facts, individuals with the greatest recovery potential after intensive care are likely younger and include those older or younger individuals who engage in cognitive rehabilitation shortly after their brain injury (but these are hypotheses that must be tested).

While cognitive functioning may improve via cognitive rehabilitation, it is also the case that patients who have experienced brain injury due to the sepsis, hypoxia, delirium, or related exposures can become more functional, even in the absence of fundamental neuroplasticity, through the use of robust compensatory strategies.⁶⁷ Compensatory strategies, in theory, can be employed at virtually any time after acute brain injury and are not dependent on the time-dependent factors that influence neuroplasticity. Compensatory strategies refer to approaches by which individuals leverage existing skills and abilities or develop new ones to "off-set" the impact of the cognitive impairment following acute brain injury. For example, these may include the use of a memory book, daily planner, or smart phone (schedule and alarms) to compensate for impaired memory. Alternatively, compensation can involve an adjustment of goals or desires so that they are more compatible with post-injury abilities.⁶⁸ For a young brain injured ICU survivor, it may be that the rigorous mechanical engineering program he was pursuing at a large elite university is no longer a viable choice in view of his difficulties with executive dysfunction, which contribute to poor decision making and planning. Compensatory strategies, for him, might involve harnessing his considerable

interpersonal skills that are likely to have been relatively less affected and using these to successfully engage in the study of sales and marketing. Of course, such a change is often not accomplished easily and frequently requires significant mental health treatment as people often experience important depression and anxiety in such circumstances and grieve their lost abilities. Indeed, the very process of developing a central goal of rehabilitation for mind and body may help ICU survivors grieve and develop a new post-injury identity that corresponds more accurately to their post-injury abilities.⁶⁹

The impact of early cognitive rehabilitation for ICU patients is not well studied but holds promise of improving cognitive outcomes. To date, a single pilot investigation – the RETURN Trial – focused specifically on the efficacy of the rehabilitation of executive dysfunction. This randomized trial by Jackson et al,²⁶ focused on general medical and surgical ICU patients and employed a protocolized approach to rehabilitation called Goal Management Training. Baseline (pre-intervention) neuropsychological testing results were well-matched in both intervention and control patients. At 3-month follow-up, intervention patients demonstrated significantly improved executive functioning on the study's primary outcome measure, which was executive function as measured with the Tower Test ($p < .01$) (Figure 2). While the RETURN Trial was a small pilot investigation with clear limitations, it has demonstrated in a preliminary way that rehabilitation of executive functioning in ICU survivors may be accomplished- but will the effect persist over time? Future studies should engage this question more fully and with larger populations to determine definitively whether executive impairments can be improved and sustained and to understand more fully the potential benefits that integration of cognitive rehabilitation into critical care may yield.

The things that follow are not incorporated into the paper above which is 2568 words (not including introduction). I think we could cut some more of the cognitive rehab part and RETURN Trial.

Organizing better systems of care, protocolization, and interpersonal passion and drive will ultimately make the difference in widespread change of culture related to sedation, delirium, and early mobility management of critically ill ICU patients.

Daily management and interdisciplinary rounds in all ICUs, yet it is all too easy to remain stuck in the status quo. To help understand why so many ICUs operate in a way that ignores this concept of “Liberating” the ICU patient from sedation, mechanical ventilation, and immobilization, we can draw on principle of Maslows Hierarchy of Needs (see section below).

Maslow's Hierarchy Provides Helpful Lens

The psychological principles encapsulated in Maslow's Hierarchy of Needs theory, which has been around for 70 years,⁸ helps explain why early ICU physicians and nurses, who were dealing merely with whether or not they could keep people alive, resorted to the most basic physiological and protective instincts for their patients and thus sacrificed more highly developed human needs in the ICU (such as communication, human interaction, and often even human esteem and dignity).⁹ Maslow's Hierarchy (Figure 1A), like other psychological theories, frames growth in the context of stages and seeks to explain broadly the conditions

that facilitate a movement toward self-actualization. Applied as a broad explanatory framework for behavior, it provides a time-tested rationale behind why we in the ICU community should now consider it grossly inadequate merely to provide seek survival without addressing the cognitive, psychiatric, and physical legacies of survivorship.^{10–13} This paper will endeavor to present Maslow's Hierarchy of Needs in the context of critical care in a way that might help improve holistic care of patients admitted to ICUs in future years. Although high mortality rates are often associated with acute critical illnesses such as severe sepsis, advancements in the management of critically ill patients have significantly improved the survival rate of patients compared to 10 years ago.²⁸ Surviving respiratory failure, acute organ dysfunction, and shock²⁹ had been the primary measure of success in critical care medicine, with **quality** of survivorship taking the backseat.³⁰ It is understandable that these cognitive and physical disabilities of the ICU survivors have gone under-recognized in the past, because the focus was initially on survival as predictably outlined by Maslow's Hierarchy of Needs. within such dire circumstances, we focus only on the most basic concerns of daily life such as food, water, and living.

Adaption of Maslow's Hierarchy – Learning from Other Disciplines

Application of Maslow's Hierarchy – Sedation as an Example in Critical Care

Examining the physiological and safety needs of ICU patients based on an adapted version of Maslow's modified Hierarchy of Needs for critical care (Figure 1B) addresses underlying requirements to change usual care practices both during and after ICU care. This will also allow us as an ICU team to move the patients "needs" into the top three tiers of Maslow's Hierarchy to include love and belonging, esteem, and self-actualization.

Recovering from Critical Illness – Application of Maslow's Hierarchy to ICU Aftercare

Packaging the ICU Patient More Safely

In the movie "Fog of War," Robert Strange McNamara, secretary of defense for JFK after having been President of Ford Motors, tells of his observations in the early 1950s that too many people were dying in cars. When he asked his advisors and engineers why, he was told it was likely a packaging problem. The engineers said, "Take eggs, for example. When you buy eggs and take them home, are they broken when you open them in your kitchen after transit home? No, because they are packaged correctly. In this way, mechanical failure is our problem." McNamara replied, "Hell, if its mechanical failure then we might be involved. Let's get to the bottom of it!" And presto, the 1956 model Ford introduced seatbelts to help save lives "Unfortunately," McNamara continued, "despite how logical it seemed, everyone was against the seatbelt, but those who did use them saved their lives." In a similar way, ICU teams seem all too often to be against "seatbelts," yet those who embrace change are often saving lives. For example, a commonly used sequencing protocol including 5 steps (i.e., the ABCDEs of critical care^{4–7}) —or similar evidence-based approaches to reducing iatrogenic injury from over-sedation, delirium, and immobilization—is like a seatbelt for our patients and ICU teams. Interestingly, in this case the "seatbelt" is actually the **removal** of restraints to mobilize and safely free the patient of tethers. McNamara took note of what his advisors and engineers stated in regard to the safety of his company's product, and he added

a *few* steps to the production line that saved *multitudes* of lives. ICU teams that have a concern for patient's safety are taking note of the most recent research and initiatives and, for example, implementing programs like the ABCDEs (www.icudelirium.org, reviewed later in the manuscript) during bedside rounds to have the same result as the seatbelt. This is a long (albeit good) explanation. Any way to make the "seatbelt" parallel shorter?

CONCLUSIONS

As advancements in critical care have translated into higher survival rates and have shifted concerns from a primary focus on survival to a broader focus on quality of life, clinicians and healthcare teams need to begin assessing the physical and cognitive disabilities that often emerge following critical illness. In the years after ICU stay, millions of survivors will face significant pain and psychiatric disturbances that often leave them with a very poor quality of life. Improving ICU patient survivorship by identifying and treating these legacies of critical care is the next step in the maturation of this burgeoning field of medicine and surgery. Historically, advances in many fields of inquiry, clinical and otherwise, have been bolstered by contributions from other disciplines. In the spirit of interdisciplinary inquiry and growth, a widely studied model from psychology, Maslow's Hierarchy of Needs, provides the framework and spark that are needed to enhance translation of care with a patient-centered emphasis on the physical and psychological complaints experienced by survivors. The poor quality of survivorship and dismantled lives of so many patients emerging from ICU care remain an under-recognized public health problem that is not being addressed rapidly enough due in part to cultural blindness to "invisible" and unseemly iatrogenic contributions to disease. The most senior critical care providers repeatedly remind others that years ago we had patients walking and awake in the ICU while on mechanical ventilation.⁷⁰ Maslow's Hierarchy principle, drummed up from previous days and others elements of science, is apropos for critical care now. It is as if TS Eliot was talking about us when he wrote: *"We shall not seek from exploring. And at the end of our exploration, we will return to the place we have been and know it for the first time."* TS Eliot

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Maslow's Hierarchy of Needs **Figure 1a.**

Maslow's Hierarchy of Needs^{8,37} – the original depiction of the hierarchy of human needs as described by Maslow in 1943. One does not move into upper tiers of human needs until the levels of needs are met at each consecutive lower level (i.e., one moves from bottom to top in a stepwise fashion).

Maslow's Hierarchy of Needs in Critical Care **Figure 1b.**

Maslow's Hierarchy of Needs adapted for the ICU (see also Table 1) – an adaption of Maslow's depiction of the hierarchy of human needs as viewed through the prism of critical care. Maslow's time-tested truths make it evident that the ICU first had to deal with the lowest level of "needs" (i.e., basic elements of survival such as cardiovascular stability, nutrition, and pain control). The persistence of that mindset as "sufficient goals for ICU care" has retarded the maturation of the culture of critical care. We must move actively towards the higher levels of human needs shown in Maslow's Hierarchy in order to restore or preserve the patient fully to his/her pre-illness mind, body, and spirit.

Figure 2.

Executive Function performance scores (measured via the Tower Test) among ICU survivors were randomized following hospital discharge in the RETURN trial [48] to receive either usual care (control patients) or a cognitive rehabilitation plus physical rehabilitation program for 12 weeks (intervention patients). Scores were measured at the time of enrollment (i.e., baseline assessment at hospital discharge) and again at 3-month follow-up when the rehabilitation program was complete. Higher scores reflect better cognitive performance. In this pilot study, both groups were similar in executive function at the time of enrollment. At the time of 3-month follow-up, as compared to the control group, the patients who received the intervention were statistically superior in their executive function as compared to the control group ($p < 0.01$).

Table 1**Building Connections between Psychology and Critical Care**

Maslow's Stage	Typical Patient Problems	Psychological Intervention/Solution
Physiological	Basic concerns about survival – frequently expressed by family members (as patients may be unaware of their medical situations)	Clearly and concisely explain to family members the array of possible outcomes so as to empower them.
Safety	Concerns about emotional well-being in the context of frequent nightmares and delusions as well as with whether the ICU team can prevent their conditions from worsening	Provide reality-orienting interventions and active emotional support – keep interventions frequent and brief; Work to address cognitive distortions and catastrophizing.
Love/Belonging	Concerns about how much support they will receive if their critical illness persists (e.g. will people continue to visit or will they forget about me) and well as whether they will “fit in” to old communities now that they have “newly acquired” disabilities that may limit them.	Highlight the importance of living in the “here and now” and encourage strategies to assist survivors in operating within the boundaries of their new limitations
Esteem	Concerns about whether they can reach recovery-related goals – e.g. return to vigorous activities or to work as soon as they had hope.	Institute interventions such as cognitive rehabilitation as a way of accelerating recovery and increasing mastery.
Self-Actualization	Concerns about ability to reconcile pre-morbid identity with “new normal” and to embrace a potentially new identity.	Encourage participation in formal counseling or psychotherapy or support groups to engage as a way of encouraging the acceptance of a new identity