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LESS IS MORE IN INTENSIVE CARE

Less is more, but are we doing enough?

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Knox and Pickkers proposed that the concept "less is more" applies to the treatment of critically ill patients in the intensive care unit (ICU) [1]. As intensivists, we need to focus on the quality of care for our critically ill patients and on reducing health care costs by eliminating waste in our health care systems. "Less is more", but we should ensure that sufficient health care services are provided to critically ill patients to improve patient outcomes. Doing less must not be confounded with doing nothing. Because each patient's clinical scenario is unique, "less is more" is not equivalent to stopping diagnostic or therapeutic interventions to reduce expenses or closing the doors of ICUs to critically ill patients and sending them home.

The distinction between cost and value is critical. High-cost interventions may provide good value because these interventions are highly beneficial; conversely, low-cost interventions may have little or no value if they provide little benefit [2]. Interventions that provide minimal or no health benefit typically have low value regardless of the cost. The elimination of these ineffective interventions and procedures would reduce both potential harm to patients and excess costs without adversely affecting the hard outcomes (safety) while providing substantial health care cost savings.

High-value care is backed by evidence that the interventions confer benefit for patients and that the likelihood of benefits exceeds that of probable harm or, more broadly, that the added costs of the intervention provide proportional added benefits relative to the alternatives [3, 4]. Physicians often have a poor understanding of patients' values and incorrectly assume that some patients would prefer to avoid aggressive or invasive interventions while other patients would favor more care rather than less care [5]. Critical care clinicians working in the ICU must minimize both risks and harm to critically ill patients. At the end of the twentieth century, Chassin and Galvin defined overuse as the provision of medical services when the potential for harm exceeds the potential for benefits [6]. *Primum non nocere*-first, do no harm-prohibits any risk and therefore effectively prevents any meaningful therapeutic endeavor [7]. This motto represents the ethical and professional responsibility of health care professionals to avoid overusing and misusing care that does not benefit patients [8].

Courtright and colleagues [9] proposed that fellowship programs focus on four major educational domains: fostering a value-based culture, providing a robust didactic experience, engaging trainees in process improvement projects, and encouraging scholarship [4, 9]. Adequate financial investment in human resources and talent development (sufficient education, research, quality and quantity of ICU nurses or physicians) is lacking in low- and middle-income countries (LMICs). ICUs in LMICs should implement strategies that allow the establishment of an empowered nurses' team that can influence productivity, resources, information, and opportunities to learn and grow professionally. Nurse or physicians retention strategies to reduce turnover will have a positive effect on professional satisfaction, associated costs, patient care, quality, and patient safety.

Critically ill patients are heterogeneous, and few interventions can be applied equally to all patients. In many ICUs of LMICs, some clinical practices depend on the availability of medical devices and supplies. They are often based on anecdotes, individual experiences or local practices ("that is the way it is done here") and have been passed down from generation to generation without academic support suggesting positive clinical impacts on patients; these approaches should be abandoned [4]. Data on the treatment outcomes of critically ill patients generated by clinical trials in LMICs are rare. Therefore, intensivists in resource-limited settings must treat their

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Table 1 Examples of interventions to improve the care and outcomes of critically ill patients in low- and middle-income countries

Change organizational culture to improve critical care performance
Strategies for improving knowledge of the epidemiology and outcomes of critically ill patients in our countries
Continuous quality improvement; redesign processes to facilitate appropriate and efficient utilization of critical care services
Development of a management algorithm to guide intensive care unit (ICU) admission
Implement preventive measures to avoid potentially inappropriate treatments in the ICU
Incorporate a high-value care curriculum into critical care fellowship training [9]
In-service training for healthcare workforce (e.g., physicians, nurses, allied health professionals) to improve the care of critically ill patients
Local consensus processes aimed at promoting the implementation of and adherence to guidelines (e.g., guidelines on the management of sepsis and acute respiratory distress syndrome) [10]
Strategies for decreasing ICU-acquired healthcare-associated infections [18]: a. Interventions to improve hand hygiene compliance in the ICU b. Strategies to enhance rational use of antibiotics in the ICU
Development of strategies to improve prescribing practices (e.g., crystalloids and/or colloids, antibiotics, vasoactive agents, corticosteroids) [19]
Strategies for improving the care of critically ill obstetric patients
Strategies for improving the care of critically ill trauma patients
Strategies for improving the care of critically ill patients during natural disasters (e.g., hurricanes, earthquakes) and epidemics (e.g., influenza, cholera, dengue shock syndrome)

patients based on the literature from high-income countries (HICs).

Sometimes "less is more", and sometimes "more is more". We need "less" aerospace medicine for LMICs, and "more" interventions are needed to improve the care and outcomes of ICU patients (Table 1). The intensivists of LMICs should actively participate in the development of recommendations for the treatment of critically ill patients in resource-limited settings such as those developed by the Global Intensive Care Working Group of the European Society of Intensive Care Medicine (ESICM) [10–12]. In addition, we must improve the decision-making processes and procedures used in our ICUs.

The implementation of less invasive procedures in the ICU that are quicker and simpler or those that avoid high-cost pharmacological treatments may actually mean "more" for ICU patients. Recently, several studies have presented the results of interventions that were not associated with better outcomes or clinical impacts for critically ill patients [13–17]. Regardless of how many well-conducted studies indicate the advantages of changes in clinical practices, the culture of the ICU, customs (traditions) and medical beliefs drive practices in critical and intensive care settings.

Less is more, but are we doing enough? That is the question. As intensivists in LMICs, we must know and understand the epidemiological characteristics of the patients we treat, and we need to create knowledge and "innovations" for in-house standardized clinical decisions, such as diagnoses, tests, or treatment selection. This information can be applied to other patients in our countries. There are some ways to guide the ongoing development of critical care in resource-limited settings [20]:

1. Develop hospital-based needs assessments with plans for stepwise interventions;
2. Focus on training to leverage available human resources, emphasizing standardized protocols;
3. Prioritize the development of relevant technology that is affordable and maintainable;
4. Use what is appropriate from HICs;
5. Stimulate interorganizational collaboration, networking and sharing of best practices.

"Innovation in intensive care is not new" [4]. There is currently a great need to improve the quality of ICU patients' management in resource-poor settings to provide effective and efficient intensive care services directed at improving outcomes in critically ill patients. Intensive care medicine research agendas from LMICs and HICs could reflect an excellent symbiosis (a win–win strategy) to achieve that goal.

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Compliance with ethical standards

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