

## From the Desk of the Editor

# When less is more: the changing paradigm in critical care medicine

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Critical care medicine is one of the fastest growing specialties. In the recent decades, the process of care and outcome of patients has improved. It looks more attributable to greater recognition and removal of harmful practices and iatrogenicity, rather than to novel pharmacological or mechanical interventions.<sup>1,2</sup> It complies with one of the fundamental principles of ethics in critical care – non-maleficence, the duty of health care professionals to avoid harm.<sup>3</sup> The historical concept of “Primum non nocere” or first do no harm, by Hippocrates, appears crucial in daily critical care practice.<sup>4-6</sup> As we manage the critically ill patients, we often may find our patients not improving despite the best practice and application of all existing understandings and evidences.<sup>7</sup> It often reminds me of the aphorism “to cure sometimes, to relieve often, to comfort always”.<sup>8</sup> The risk and benefit of the proposed treatments need to be weighed before deciding to treat, despite significant risks are employed.<sup>6</sup> Studies in the past decades have challenged many conventional wisdoms and taught us the lessons that overuse or misuse of drugs or devices, and/or excessively striving for physiological or biochemical normality, may provide short term gains but at the expense of longer-term detriments.<sup>9</sup> Thus the concept of “less is more” is evolving in critical care medicine.

I have tried to mention some, among many interventions, for which less has been shown to be associated with a better outcome. In patients with acute lung injury and acute respiratory distress syndrome, mechanical ventilation with a lower tidal volume of 6 ml per kilogram of predicted body weight or less, keeping the plateau pressure of 30 cm of water or less, when compared to traditional ventilation treatment involving a tidal volume of 12 ml per kilogram of predicted body weight and the plateau pressure of 50 cm of water or less is associated with decreased mortality and increase in the number of days without ventilator use.<sup>10,11</sup> The decrease in mortality is probably attributable to reduction of ventilator-induced lung injury, by avoiding the iatrogenic harm of conventional ventilation strategies.<sup>12</sup>

While aggressive fluid resuscitation, early in the course of sepsis is beneficial, liberal fluid administration later in the course may be deleterious.<sup>13</sup> Conservative strategies of fluid management may be beneficial in patients with acute lung injury in terms of improved lung function and shortened duration of mechanical ventilation and intensive care without increasing non-pulmonary organ failures.<sup>14</sup> In critically ill patients, positive cumulative fluid balance is associated with intra-abdominal hypertension and worst outcome. In patients not transgressing spontaneously from Ebb to Flow phases of shock, late conservative fluid management and late goal directed de-resuscitation can be beneficial.<sup>15,16</sup>

Following the initial extensive use of pulmonary artery catheter to guide management of critically ill patients, its use has progressively declined considering the invasiveness of the procedure for insertion and lack of conferred benefits.<sup>17,18</sup> Less invasive and non-invasive devices are emerging as possible surrogates for cardiac output monitoring.<sup>19</sup> Besides hemodynamic monitoring, evidence is also growing in favour of other less invasive monitoring modalities.<sup>20-22</sup>

Transfusion of blood and blood products has been associated with multiple complications including transfusion related acute lung injury (TRALI) and transfusion associated circulatory overload (TACO).<sup>23,24</sup> Evidence is growing in favor of restricted transfusion rather than liberal transfusion.<sup>25</sup> It does seem true for critically ill adult patients,<sup>26</sup> pediatric patients,<sup>27</sup> patients with septic shock,<sup>28</sup> patients with acute upper gastrointestinal bleeding,<sup>29</sup> and in patients with myocardial infarction.<sup>30</sup>

Following the landmark paper by Van den Berghe et al, which showed significant reduction in morbidity and mortality among surgical critically ill patients, who underwent intensive insulin therapy, there was a paradigm shift in practice towards tight glycemic control in critically ill patients.<sup>31</sup> However, subsequent studies and meta-analysis failed to replicate similar results. Moreover, there was increased risk of hypoglycemia in patients undergoing intensive insulin therapy.<sup>32-34</sup> The potential harm of tight glycemic control in critically ill patients, was shown in the large international randomized trial – the NICE-SUGAR study. The blood sugar target of 180 mg or less per deciliter resulted in lower mortality than did a target of 81 to 108 mg per deciliter.<sup>35</sup>

In patients with ventilator associated pneumonia, with the possible exception of those developing nonfermenting gram-negative bacillus infection, a shorter duration (7-8 days) of appropriate antibiotic therapy was comparable to prolonged course (10 to 15 days) in terms of effectiveness.<sup>36,37</sup> Procalcitonin guided strategy to reduce the duration of antibiotic treatment can safely reduce the duration of antibiotic exposure and potentially minimize the emergence of multidrug-resistant bacteria in intensive care units.<sup>38</sup> In patients with severe sepsis and septic shock, de-escalation of empirical antibiotic therapy, defined as discontinuation of an antimicrobial agent or change of antibiotic to one with a narrower spectrum once culture reports are available, is associated with lower mortality.<sup>39</sup>

However, “less is more” is not a general rule. Sometimes, we find “more is more” in intensive care. Early physical and occupational rehabilitation in critically ill, mechanically ventilated patients is associated with better outcome.<sup>40</sup> Goal

directed therapy, aiming at augmenting oxygen delivery index is found to be beneficial in high-risk patients undergoing major surgery.<sup>41,42</sup> Effective antimicrobial administration within first hour of septic shock is associated with improved survival.<sup>43,44</sup>

Considering the fact that preventable harm is not uncommon in ICU,<sup>45,46</sup> adapting a more cautious approach while managing the vulnerable critically ill patients,<sup>5,47</sup> respecting the concept of “**Primum non nocere**”, can be associated with improved outcome. It would be prudent to keenly and closely follow the results of new trials and to individualize the strategies of intervention for individual patients.<sup>6</sup> Today, and for the centuries to come, the role of an intensivist can often appear to support the physiology of a patient while waiting for the mother nature to heal, as mentioned by Oliver Wendell Holmes – “the art of medicine consists of amusing the patient until nature cures the disease”.<sup>48</sup> That is when less actually may mean more for our patients.



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