

subsequent transfusion-associated adverse events. However, we pointed out in our publication several times that this RCT was not powered for mortality and a multicenter study with a larger study population is needed to confirm the results of our single-center RCT.

Klaus Görlinger, Dr. med.,* Christian Friedrich Weber, Dr. med., Kai Zacharowski, Prof. Dr. med., Ph.D., F.R.C.A.

*University Hospital Essen, University Duisburg-Essen, Hufelandstrasse, Germany. klaus@goerlinger.net

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Case Scenario Consistent with Lack of Knowledge and Psychological Bias

To the Editor:

Scemama and Hull present a “Case Scenario” followed by a fascinating discussion of leadership principles.¹ However, several of the scenario’s observations can be explained based on operational (physical) and behavioral (psychological) principles rather than organization (leadership).

(1) “The anesthesiology department of a large academic medical center has recently implemented a series of operating room (OR) and anesthesia efficiency measures designed to improve on-time starts, reduce turnover times, and manage patient preoperative times.” (2) “These measures will be used to set targets and to measure the performance of providers ... She is very focused on being as efficient as possible when running her

cases ...” (3) “Some of the residents she oversees ... do not seem to take the newly implemented efficiency initiatives seriously.”

- 1) Improved on-time starts and reduced turnover times can increase OR and anesthesia group efficiency, but neither is a measure of (allocative or technical) efficiency.^{2,3} Suppose every Monday a service has mean \pm SD of 7.2 ± 0.5 h of cases. The staffing (allocated time) should be 8 h. If reducing turnovers were to reduce the mean from 7.2 to 6.8 h, there would be no change in staffed hours, overutilized time, or efficiency.³ If the workload were 8.4 ± 0.5 h, 8-h staffing would be more efficient than 10 h.³ An equal reduction in turnovers would reduce the mean from 8.4 to 8.0 h, reduce overutilized time, and increase efficiency.^{2,3}
- 2) Comparing on-time starts and turnovers among anesthesiologists is not evidence based.^{4–6} Furthermore, unless organizations provide cues (recommendations), decisions made by anesthesiologists supervising (medically directing, *etc.*) multiple ORs to improve on-time starts and reduce turnover times can worsen efficiency.⁷ The reason is that anesthesiologists apply rules-of-thumb (“heuristics”) rational for decisions involving single ORs, but suboptimal when applied to multiple ORs.⁸ Individuals’ and organizations’ perceptions that on-time starts are important for efficiency are due to both lack of scientific knowledge and psychological bias (*e.g.*, known that most cases take less time than scheduled yet [incorrectly] think starting a few minutes late results in the list of cases finishing a few minutes late).^{9–11}
- 3) Perhaps “some of the residents” not taking the “efficiency initiatives seriously” received systems-based practice training (*i.e.*, knew better).¹² I appreciate this is unlikely and that the authors’ goal for the case scenario may have been one of presentation to motivate their excellent review. Yet, it seems to me ideal for leadership to rely on the evidence-based management science, especially when developed in part by and for anesthesiologists.

Franklin Dexter, M.D., Ph.D., University of Iowa, Iowa City, Iowa. franklin-dexter@uiowa.edu

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In Reply:

We thank Dr. Dexter for his comments about our recent article.¹ We agree with him about the need for effective leadership practices to be rooted in both evidenced-based behavioral and management science.

The efficiency measures presented in our case were selected for illustration purposes but do reflect an aggregate of practices that we understand have been implemented at various institutions, even if some of them may be misguided as highlighted by Dr. Dexter. The reaction of the residents to such efficiency measures is based on discussions by Dr. Scemama with residents at his and other institutions.

Dr. Dexter seems to draw a distinction between behavioral and leadership principles. As discussed in our case scenario, the foundation of leadership is behavioral,¹ and effective leadership requires the ability to recognize and to navigate both our own and others' cognitive, emotional, and relational biases. The successful implementation of process improvement requires both sound management science and effective leadership. We believe that the intersection between effective leadership and management science in anesthesiology is an exciting area for further investigation.

Pascal H. Scemama, M.D., M.B.A.,* Jeffrey W. Hull, Ph.D. *The Massachusetts General Hospital, Boston, Massachusetts. pscemamadegallully@partners.org

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Facemask Ventilation and Neuromuscular Blockade in Anesthetized Patients

To the Editor:

In a thought-provoking study, assessing the effects of muscle relaxants on facemask ventilation (FMV) in the anesthetized patients with normal upper airway anatomy, Ikeda *et al.*¹ showed that rocuronium did not deteriorate FMV without airway interventions, and FMV was improved after succinylcholine administration in association with airway dilation during pharyngeal fasciculation. However, apart from the limitations described in the discussion, there are two aspects of this study that should be discussed.

First, it would be interesting to know why this study was performed in a neutral head and mandible position without airway interventions, which are not the practical airway management methods during anesthesia induction. Actually, upper airway obstruction is common during anesthesia induction due to loss of muscle tone present in the awake state.² To obtain an adequate FMV and then make an easy laryngoscopy, a sniffing position is generally recommended in the clinical practice, especially for the patients with a difficult airway.^{2,3} A previous study from the authors' team in patients with obstructive sleep apnea showed that compared with the neutral position, the sniffing position structurally improved maintenance of the passive pharyngeal airway at both retropalatal and retroglottal segments,⁴ which are the most common sites of upper airway obstruction.⁵ Moreover, the simple airway interventions, such as head tilt, jaw thrust, and open mouth (known as the triple airway maneuver), are the reliable methods frequently used to achieve upper airway patency in the anesthetized patients.² The another study from the authors' team showed that anesthesia induction and complete paralysis caused the upper airway obstruction in all patients with obstructive sleep apnea when the jaw thrust was not performed, while a combination of head tilt and jaw thrust restored airway patency and allowed adequate FMV ventilation.⁶ Considering the fact that the four patients in the rocuronium group were excluded from this study because of inadequate FMV, we would like to know whether the study design required a minor or moderate upper airway obstruction by a neutral head and mandible position without airway interventions. It is certain that the head and neck position of the anesthetized patients can affect the longitudinal tension on the upper airway and the manual airway interventions may change the caliber of the retrolingual and retropalatal airways, worsening or improving airway patency.^{2,5} Thus, we believed that if the patients are placed in a sniffing position with airway interventions in this study, as needed in the routine anesthesia induction, different result would have been obtained.