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## EDITORIAL

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# Anesthesiologists and their monitoring: benefits, limits and confusing factors

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A significant part of the publications in anesthesia is related to the management (and the prevention) of postoperative complications. Since the 1980's, these complications have been drastically reduced, notably due to the development of monitoring devices. We can now monitor almost all of the patient's vital functions. The same monitoring can be used both for its primary function (*e.g.* monitoring the depth of anesthesia in awareness prevention), but the same monitoring combined with other ones can be used for a different prediction (*e.g.* monitoring the depth of anesthesia coupled with arterial pressure and inhaled agents monitoring can predict postoperative mortality).<sup>1</sup>

Gradually, anesthesiologists become increasingly confident in their monitoring. The other side of the coin is that some anesthesiologists are progressively losing their clinical skill. On the one hand, some can trust the monitoring blindly. On the other hand, some are wrongly convinced that the displayed value is incorrect. In all these aforementioned situations, the monitoring does not improve the patient's safety but represents the source of a decision-making error. These errors exhibit variable consequences for the patient. Lastly, Greig *et al.* have demonstrated that there exists a wide variation in risk tolerance amongst anesthesiologists.<sup>2</sup>

Currently, monitoring is an essential part of

anesthesia, and it could no longer be otherwise. As mentioned, the first goal of the monitoring is providing an optimal risk reduction. In that way, the monitoring must be accompanied by two different actions: training in various clinical scenarios through simulations, and the improvement of the clinician's knowledge of the limits (and potential artifacts) of the various monitoring systems.

The simulation should be performed frequently in anesthesia. Indeed, the principles of Crisis Resource Management show that the skills required to reduce risk in anesthesia are both individual and collective.<sup>3</sup> The collective skills required for a successful team are the results of diverse knowledge, skills, and attitudes. The contribution of the simulation to the analysis of monitoring could allow us to move from unique expertise to the intervention of efficient members as part of an expert team.

The simulation is a powerful tool for training health professionals to work in a team during critical situations. The quality of care and decision-making in these situations are directly related to non-technical capacities (collective awareness of the situation, communication, leadership, etc.). Simulation develops the individual and collective resilience capacities of clinicians, and it is complementary to their training capacities in technical skills.<sup>4</sup>

But, until now, there are only a few data published on the diagnosis and the integration of potential errors in the monitoring. However, these devices are subject to artifacts that can influence the displayed values. In an excellent comprehensive narrative review article published in this issue of *Minerva Anestesiologica*, Ashraf Dahaba presents the different factors that can affect the performance of this monitoring.<sup>5</sup> He has conducted an in-depth and nearly exhaustive review of the factors that can influence or limit the electroencephalography analysis. As stated by the author, “the aim and main objective of the present comprehensive narrative review article is to critically analyze these published reports of disparate depth of anesthesia numbers in a manner that could be beneficially utilized in daily practice.” This objective is achieved and gives the reader a clear and complete idea of the subject.

In this article, the author reviews the concepts of physiology and pathophysiology that may influence the monitoring of depth of anesthesia, as well as pharmacological effects, and finally, technological limitations. Monitoring is a valuable aid for the anesthesiologist, but it must be used properly. This article allows both the novice

and the reader familiar with the depth of anesthesia monitoring to get the most out of it. This article will enable anesthesiologists to approach such monitoring with the aim of interpreting the displayed values in the light of the clinical and technical conditions that may influence them.

We are convinced that this review would be beneficial for many clinicians besides to simulation session.

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*Conflicts of interest.*—The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

*Comment on:* Dahaba AA. Benefits and boundaries of processed electroencephalography (pEEG) monitors when they do not concur with standard anesthetic clinical monitoring: lights and shadows. *Minerva Anestesiologica* 2020;86:304–16. DOI: 10.23736/S0375-9393.19.13959-4

*History.*—Manuscript accepted: February 5, 2020. - Manuscript revised: January 15, 2020. - Manuscript received: November 20, 2019.

(Cite this article as: Deflandre EP, Javillier BX. Anesthesiologists and their monitoring: benefits, limits and confusing factors. *Minerva Anestesiologica* 2020;86:250-1. DOI: 10.23736/S0375-9393.20.14297-4)