

# What about Memory, Consciousness, Recall, and Awareness in Anesthesia?

## Dear Editor,

I read with interest the article by Hadavi and colleagues regarding the Evaluation of the Adequacy of General Anesthesia in Cesarean Section by Bispectral Index.<sup>1</sup>

It is fair to say that at the moment the Bispectral Index (BIS) does not offer guarantees for awareness prevention and as reported by Avidan, the use of the Bispectral Index could give anesthesiologists a false sense of security that if they keep the measurement between 40 and 60, they will prevent awareness.<sup>2</sup> Why do we continue to use the BIS? It simply guides us in saving drugs and facilitating recovery from anesthesia.<sup>3</sup>

Your statements regarding benzodiazepines are correct, because, although the American Society of Anesthesiologists (ASA) recommends their use in select cases,<sup>4</sup> their effects on brain connectivity,<sup>5</sup> and therefore the impact on consciousness as well as their role in anterograde and retrograde memory<sup>6</sup> are well documented.

However, I have to make some clarifications. I noted an inaccuracy in the statistics. The incidence of awareness has been reported at 0.10%-0.20%, therefore a cohort of 60 patients was inadequate to reach a precise conclusion.

I observed confusion in the terminology that has pertained to explicit memory, consciousness, recall and awareness. Explicit memory is a type of long-term memory that relates to facts or events secondary to the consolidation time dependent. The terms recall and awareness can be used interchangeably because the exact definition of intraoperative awareness is the presence of both consciousness and explicit memory with recall of surgical events. With this definition, awareness, and therefore, recall, shall provide power for a moment of consciousness.

In your study, patients were interviewed up to 24 hours after surgery. There have been reports of awareness up to one week after anesthesia, although they are less likely.

Post-traumatic stress syndrome (PTSD) is a well-defined syndrome (DSM-V) that constitutes a clear precipitating event, which in our case is awareness. The incidence of PTSD post-awareness is unclear and ranges from 2% to 71% of awareness cases. Thus, PTSD cannot exist post-awareness without awareness.

In the near future, there will be new technologies available that monitor the depth of anesthesia based on the theory of brain connectivity by Tononi et al.<sup>7,8</sup> It is my hope you can use these technologies to report your studies in the literature.

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