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Titel des Beitrags:
Monitoring depth of anesthesia utilizing a combination of electroencephalographic and standard measures.

Abstract:
For decades, monitoring depth of anesthesia was mainly based on unspecific effects of anesthetics, for example, blood pressure, heart rate, or drug concentrations. Today, electroencephalogram-based monitors promise a more specific assessment of the brain function. To date, most approaches were focused on a "head-to-head" comparison of either electroencephalogram- or standard parameter-based monitoring. In the current study, a multimodal indicator based on a combination of both electroencephalographic and standard anesthesia monitoring parameters is defined for quantification of "anesthesia depth." Two hundred sixty-three adult patients from six European centers undergoing surgery with general anesthesia were assigned to 1 of 10 anesthetic combinations according to standards of the enrolling hospital. The anesthesia multimodal index of consciousness was developed using a data-driven approach, which maps standard monitoring and electroencephalographic parameters into an output indicator that separates different levels of anesthesia from awake to electroencephalographic
burst suppression. Obtained results were compared with either a combination of standard monitoring parameters or the electroencephalogram-based bispectral index. The anesthesia multimodal index of consciousness showed prediction probability (P(K)) of 0.96 (95% CI, 0.95 to 0.97) to separate different levels of anesthesia (wakefulness to burst suppression), whereas the bispectral index had significantly lower PK of 0.80 (0.76 to 0.81) at corrected threshold P value of less than 0.05. At the transition between consciousness and unconsciousness, anesthesia multimodal index of consciousness yielded a PK of 0.88 (0.85 to 0.91). A multimodal integration of both standard monitoring and electroencephalographic parameters may more precisely reflect the level of anesthesia compared with monitoring based on one of these aspects alone.