

Advertisement

Search less. Learn more.

Randomized Comparison of Strategies for Reducing Treatment
[Abstract](#) | [FREE Full Text](#) | [PDF](#)
 N Engl J Med 356:2027, May 17, 2007. Original Article

The Asthma Epidemic
 Eder W, Ege MJ, von Mutius E
[Extract](#) | [Full Text](#) | [CME Exam](#) | [PDF](#)
 N Engl J Med 355:998-1004, 2006. Original Article



The NEW ENGLAND JOURNAL of MEDICINE

[FREE NEJM E-TOC](#) | [HOME](#) | [SUBSCRIBE](#) | [CURRENT ISSUE](#) | [PAST ISSUES](#) | [COLLECTIONS](#) | [SEARCH](#) [Advanced Search](#)

[Sign in](#) | [Get NEJM's E-Mail](#) | [Table of Contents](#) — [Free](#) | [Subscribe](#)

ORIGINAL ARTICLE

[◀ Previous](#)

Volume 358:1097-1108

March 13, 2008

Number 11

[Next ▶](#)

Anesthesia Awareness and the Bispectral Index

Michael S. Avidan, M.B., B.Ch., Lini Zhang, M.D., Beth A. Burnside, B.A., Kevin J. Finkel, M.D., Adam C. Searleman, B.S., Jacqueline A. Selvidge, B.S., Leif Saager, M.D., Michelle S. Turner, B.S., Srikar Rao, B.A., Michael Bottros, M.D., Charles Hantler, M.D., Eric Jacobsohn, M.B., Ch.B., and Alex S. Evers, M.D.

ABSTRACT

Background Awareness during anesthesia is a serious complication with potential long-term psychological consequences. Use of the bispectral index (BIS), developed from a processed electroencephalogram, has been reported to decrease the incidence of anesthesia awareness when the BIS value is maintained below 60. In this trial, we sought to determine whether a BIS-based protocol is better than a protocol based on a measurement of end-tidal anesthetic gas (ETAG) for decreasing anesthesia awareness in patients at high risk for this complication.

Methods We randomly assigned 2000 patients to BIS-guided anesthesia (target BIS range, 40 to 60) or ETAG-guided anesthesia (target ETAG range, 0.7 to 1.3 minimum alveolar concentration [MAC]). Postoperatively, patients were assessed for anesthesia awareness at three intervals (0 to 24 hours, 24 to 72 hours, and 30 days after extubation).

Results We assessed 967 and 974 patients from the BIS and ETAG groups, respectively. Two cases of definite anesthesia awareness occurred in each group (absolute difference, 0%; 95% confidence interval [CI], -0.56 to 0.57%). The BIS value was greater than 60 in one case of definite anesthesia awareness, and the ETAG concentrations were less than 0.7 MAC in three cases. For all patients, the mean (\pm SD) time-averaged ETAG concentration was 0.81 \pm 0.25 MAC in the BIS group and 0.82 \pm 0.23 MAC in the ETAG group (P=0.10; 95% CI for the difference between the BIS and ETAG groups, -0.04 to 0.01 MAC).

Conclusions We did not reproduce the results of previous studies that reported a lower incidence of anesthesia awareness with BIS monitoring, and the use of the BIS protocol was not associated with reduced administration of volatile anesthetic gases. Anesthesia awareness occurred even when BIS values and ETAG concentrations were within the target ranges. Our findings do not support routine BIS monitoring as part of standard practice. (ClinicalTrials.gov number, NCT00281489 [[ClinicalTrials.gov](#)].)

Source Information

From the Department of Anesthesiology, Washington University School of Medicine, St. Louis.

Address reprint requests to Dr. Avidan at Washington University School of Medicine, 660 S. Euclid Ave., Campus Box 8054, St. Louis, MO 63110, or at avidanm@wustl.edu.

Full Text of this Article

Related Letters:

Anesthesia Awareness and the Bispectral Index

Kelley S. D., Manberg P. J., Sigl J. C., Myles P. S., Leslie K., Forbes A., Bo L., Li J., Deng X., Aretha D., Kiekkas P., Eleftheria P., Cook T. M., Avidan M. S., Searleman A. C., Evers A. S., Orser B. A.

[Extract](#) | [Full Text](#) | [PDF](#)

N Engl J Med 2008; 359:427-431, Jul 24, 2008. **Correspondence**

This article has been cited by other articles:

- Kelley, S. D., Manberg, P. J., Sigl, J. C., Myles, P. S., Leslie, K., Forbes, A., Bo, L., Li, J., Deng, X., Aretha, D., Kiekkas, P., Eleftheria, P., Cook, T. M., Avidan, M. S., Searleman, A. C., Evers, A. S., Orser, B. A. (2008). Anesthesia Awareness and the Bispectral Index. *NEJM* 359: 427-431 [[Full Text](#)]
- Sneyd, J. R., Mathews, D. M. (2008). Memory and awareness during anaesthesia. *Br J Anaesth* 100: 742-744 [[Full Text](#)]
- Orser, B. A. (2008). Depth-of-Anesthesia Monitor and the Frequency of Intraoperative Awareness. *NEJM* 358: 1189-1191 [[Full Text](#)]

NEJM's E-Mail
Table of Contents
[SIGN UP NOW FREE](#)

THIS ARTICLE

- ▶ Full Text
- ▶ PDF
- ▶ PDA Full Text
- ▶ PowerPoint Slide Set
- ▶ CME Exam
- ▶ Purchase this article

COMMENTARY

- ▶ Editorial by Orser, B. A.
- ▶ Letters

TOOLS & SERVICES

- ▶ Add to Personal Archive
- ▶ Add to Citation Manager
- ▶ Notify a Friend
- ▶ E-mail When Cited
- ▶ E-mail When Letters Appear

MORE INFORMATION

- ▶ PubMed Citation

[HOME](#) | [SUBSCRIBE](#) | [SEARCH](#) | [CURRENT ISSUE](#) | [PAST ISSUES](#) | [COLLECTIONS](#) | [PRIVACY](#) | [HELP](#) | [beta.nejm.org](#)

Comments and questions? Please [contact us](#).

The New England Journal of Medicine is owned, published, and [copyrighted](#) © 2008 [Massachusetts Medical Society](#). All rights reserved.