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Preventing, and managing the impact of, anesthesia awareness

Anesthesia awareness, also called unintended intraoperative awareness, occurs under general anesthesia when a patient becomes cognizant of some or all events during surgery or a procedure, and has direct recall of those events. Because of the routine use of neuromuscular blocking agents (also called paralytics) during general anesthesia, the patient is often unable to communicate with the surgical team if this occurs.

The frequency of anesthesia awareness has been found in multiple studies to range between 0.1 percent and 0.2 percent of all patients undergoing general anesthesia.(1), (2), (3) The administration of general anesthesia to 21 million patients annually in the United States translates to the occurrence of 20,000 to 40,000 cases of anesthesia awareness each year. Patients experiencing awareness report auditory recollections (48 percent), sensations of not being able to breathe (48 percent), and pain (28 percent).(1) Over 50 percent of these patients are reported to experience mental distress following surgery, including an indeterminate number with post-traumatic stress syndrome. (2) , (3) Some patients describe these occurrences as their "worst hospital experience," and some determine to never again undergo surgery. The incidence of awareness is reported to be greater in patients in which the dose of general anesthetic must be smaller and carefully titrated to decrease significant side effects, for example, a patient who is hemodynamically unstable. Procedures typically identified as falling into this category are some cardiac, obstetric and major trauma cases.(4) Factors contributing to the risk of anesthesia awareness include the increasing use of intravenous (IV) delivery of anesthesia, as opposed to inhalation, and the premature lightening of anesthesia at the end of procedures to facilitate OR turnover.

Monitoring patients under general anesthesia to prevent anesthesia awareness can be challenging. Despite a variety of available monitoring methods, awareness is difficult to recognize while it is occurring. Typical indicators of physiologic and motor response, such as high blood pressure, fast heart rate, or movement, or hemodynamic changes, are often masked by the use of paralytic agents to achieve necessary muscle relaxation during the procedure, as well as the concurrent administration of other drugs necessary to the patient's management, such as beta-blockers or calcium channel blockers.

To overcome the limitations of current methods to detect anesthesia awareness, new methods are being developed that are less affected by the drugs typically used during general anesthesia. These devices measure brain activity rather than physiological responses. These electroencephalography (EEG) devices (also called level-of-consciousness, sedation-level and anesthesia-depth monitors) include the Bispectral Index (BIS)®, spectral edge frequency (SEF) and median frequency (MF) monitors. These devices may have a role in preventing and detecting anesthesia awareness in patients with the highest risk, thereby ameliorating the impact of anesthesia awareness. A body of evidence has not yet accumulated to definitely define the role of these devices in detecting and preventing anesthesia awareness; the Joint Commission expects additional studies on these subjects to emerge. In its review of the Bispectral Index (BIS)® monitor, the Food and Drug Administration determined that "Use of BIS monitoring to help guide anesthetic administration may be associated with the reduction of the incidence of awareness with recall in adults during general anesthesia and sedation."

The anesthesia professional must often balance the psychological risks of anesthesia awareness against the physiological risks of excessive anesthesia for many critical medical conditions. The Joint Commission has asked the American Society of Anesthesiologists (ASA) and the American Association of Nurse Anesthetists (AANA) to address the adequacy of current monitoring practices regarding anesthesia levels, including those that involve little or no technological support.

Reducing the risk of anesthesia awareness

Both the ASA and the AANA provide guidelines for administering and monitoring anesthesia. Specific recommendations for the prevention of awareness are addressed in the February 2000 issue of *Anesthesiology*.(4) These include:

- Consider premedication with amnesic drugs, e.g., benzodiazepines or scopolamine, particularly when light anesthesia is anticipated.
- Administer more than a "sleep dose" of induction agents if they will be followed immediately by tracheal intubation.
Avoid muscle paralysis unless absolutely necessary and, even then, avoid total paralysis [by using only the amount clinically required].
- Conduct periodic maintenance of the anesthesia machine and its vaporizers, and meticulously check the

machine and its ventilator before administering anesthesia.

- In addition, anesthesia practitioners should be alert to patients on beta-blockers, calcium channel blockers and other drugs that can mask physiologic responses to inadequate anesthesia.

Managing the impact of anesthesia awareness

As noted above, anesthesia awareness cannot always be prevented. Health care practitioners must therefore be prepared to acknowledge and manage the occurrence of anesthesia awareness with compassion and diligence. This management includes the following suggestions for patients who report awareness (4):

- Interview the patient after the procedure, taking a detailed account of his or her experience and include it in the patient's chart.
- Apologize to the patient if anesthesia awareness has occurred. Assure the patient of the credibility of his or her account and sympathize with the patient's suffering.
- Explain what happened and its reasons, e.g., the necessity to administer light anesthesia in the presence of significant cardiovascular instability.
- Offer the patient psychological or psychiatric support, including referral of the patient to a psychiatrist or psychologist.
- Notify the patient's surgeon, nurse and other key personnel about the incident and the subsequent interview with the patient. Surgical team members should also be educated about anesthesia awareness and its management.

Joint Commission recommendations

Anesthesia awareness is under-recognized and under-treated in health care organizations. The Joint Commission recommends that health care organizations which perform procedures under general anesthesia do the following to help prevent and manage anesthesia awareness:

1. Develop and implement an anesthesia awareness policy that addresses the following:
 - Education of clinical staff about anesthesia awareness and how to manage patients who have experienced awareness.
 - Identification of patients at proportionately higher risk for an awareness experience, and discussion with such patients, before surgery, of the potential for anesthesia awareness.
 - The effective application of available anesthesia monitoring techniques, including the timely maintenance of anesthesia equipment.
 - Appropriate post-operative follow-up of all patients who have undergone general anesthesia, including children. The identification, management and, if appropriate, referral of patients who have experienced awareness.
2. Assure access to necessary counseling or other support for patients who are experiencing post-traumatic stress syndrome or other mental distress.

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