Re: Anesthesia "Awareness"

The Hollywood movie “Awake” (released November 30, 2007 [http://www.awakethemovie.com](http://www.awakethemovie.com)) focuses on anesthesia awareness, whereby a patient describes being conscious during heart surgery, when under general anesthesia. Recently, there has been media coverage around the issue as well. We believe that patients may have questions around the issue of intraoperative awareness, and thus, have prepared the following Frequently Asked Questions and Answers:

1. **What is awareness during general anesthesia?**
   Awareness under general anesthesia (i.e. where the patient is not meant to be aware) is rare, and occurs when a patient describes their being aware of conversation, movement, pressure or discomfort. While awareness of any sort is rare, awareness that includes pain is very rare.

2. **How common is awareness during general anesthesia?**
   It is thought to occur in approximately 1 per 1,000 general anesthetics overall. However, this is mostly in so-called ‘high risk’ patient groups. Indeed, in low-risk groups of patients, the incidence of awareness is less than 1 case in every 20,000 anesthetics.

3. **Why does awareness occur?**
   There are several possible reasons. 
   
   *First*, there may be patients whose brains are inherently more resistant to the memory-abolition effects of anesthetic medications than to other effects of anesthetics. This possibility is based on the identification of special effects of anesthetics in animal experiments, and if true, could allow us to predict ‘intrinsic’ risk of awareness -and therefore prevent it- in certain patients. Research on this patient subset is currently underway.

   *Second*, there are patients who are at higher risk than others, for example, patients taking medications that alter their responses to general anesthetics, patients who have suffered major trauma (for example, those in critical condition following an accident), some types of cardiac surgery and women undergoing emergency Cesarean Sections.

   *Third*, there can be an error in administration of the anesthetic medication (insufficient medication given, equipment malfunction or other type of medication error). This type of problem is very rare because anesthesiologists check the medications and equipment very carefully as a matter of practice and gauge how much medication to give to patients in part based on how the patients' vital signs respond. The anesthesiologist monitors these signs continuously throughout an anesthetic; thus if a patient is receiving too much or too little of an anesthetic medication, the anesthesiologist will very likely observe that at an early stage, and adjust the medication accordingly.

4. **How do patients describe awareness?**
   Patients characteristically describe hearing conversation, movement, pressure or sometimes discomfort during their anesthetic and surgery.

5. **Do all patients who experience awareness also experience pain?**
   No. Pain is reported in a small minority of patients who experience awareness – roughly 1/3 of patients with awareness report discomfort.
6. Are certain surgical procedures associated with an increased incidence of awareness?
Yes, patients taking medications that alter their responses to general anesthetics such as long-term narcotics, some blood-pressure medications or sedatives, patients who have suffered major trauma, some types of cardiac surgery patients, and emergency Cesarean sections.

7. Can the Anesthesiologist detect awareness during the surgical procedure?
There is no absolute guarantee of being able to detect awareness - hence the issue. However, it is rare because anesthesiologists are experienced at administering (and adjusting) anesthetic medications to a wide variety of patients, and constantly monitor a variety of responses that may indicate how ‘deeply’ anesthetized a patient is.

8. Is there any way that a patient can communicate that they are experiencing awareness to the Anesthesiologist (e.g., blink or move)?
No. When patients are able to move, the anesthesiologist uses such movement as an indicator of how ‘deep’ the anesthetic is, and use such movement to adjust the medication accordingly.

9. Are there certain procedures or medications that can be administered that will ensure the patient absolutely will not experience awareness or wake up?
If awareness is especially likely, the anesthesiologist can administer higher doses of medications that can specifically inhibit memory. This would however result in more side effects (nausea, prolonged sedation, etc.) and therefore would be problematic if systematically administered to all patients (and the vast majority of patients would not benefit from the intervention). However, in ‘high risk’ patients, such an intervention could be well worthwhile. A very high degree of reassurance is possible although there are no absolute guarantees.

10. Are there any medical conditions that predispose patients to awareness?
Some conditions mean that a patient has very little what is called ‘reserve’; for example, shortly after a major acute illness such as trauma or hemorrhage, a patient may be poorly able to tolerate a large amount of anesthetic medication. Of course, there are many anesthetic medications from which to choose. But even with many options and great expertise, a small minority of patients have to undergo urgent life-saving surgery at a time when they cannot tolerate higher doses of anesthetic medication; until their condition is stabilized such patients may have episodes of awareness.

11. Is there technology available to monitor the patient’s level of consciousness?
Yes there is; indeed if used carefully, such ‘Brain’ monitors may reduce the incidence of awareness in so-called high-risk patients. However there are several problems with these types of monitors that are often not appreciated.

First, these monitors detect electrical signals from the outer surface of the brain. Unfortunately, the ‘memory’ part of the brain (i.e. the part of the brain that is associated with the patient being able to ‘recall’ or remember the incident) is deep inside the brain and is not detected using these monitors.

Second, the monitors report the possibility of an awareness event after it has occurred, not as it begins.

Third, the monitors may not perform well in low-risk (i.e. the vast majority of) patients. Indeed it is possible that because the monitors do not perform well in most patients, an incorrect level of anesthesia might result because of misleading information.
12. What are the outcomes of anesthesia awareness, post-surgery?
An episode of awareness under general anesthesia can lead to significant psychological difficulties including, in extreme cases, a condition called Post-Traumatic Stress Disorder (PTSD). It is thought to be extremely important that potential episodes be dealt with in a frank and expert manner, including frank admission of the possibility of awareness as well as a review of the likely reasons for the potential episode in question. Patients who may have experienced an episode of awareness should discuss this with their anesthesiologist so that such issues can be addressed, and referral for psychological support arranged if needed.

13. What training do Anesthesiologists in Canada possess?
We are fortunate that in Canada there is a very high standard of expertise in the provision of anesthesia. Anesthesia is provided by physicians specially trained in anesthesia; the majority of such physicians - anesthesiologists - complete a five-year residency in anesthesia and are subsequently certified as specialists by the Royal College of Physicians of Canada. A new development, the anesthesia care team, is a physician-led team of personnel involved in the care of patients undergoing anesthesia.

14. Is research looking at anesthesia awareness currently under way at the University of Toronto?
Yes. One group of researchers in the Department of Anesthesia at the University of Toronto examines in detail how anesthetic agents work; such understanding may shed light on why some patients are more or less sensitive to various effects of anesthetics on the brain. Other groups in the department study complications of anesthesia that developed in patients in order to understand how best to care for patients.

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