

# Incidence of consciousness during surgery lower than previous estimates

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An international study of 260 surgical patients found that, contrary to many previous studies, just more than four percent were conscious of the external world while under general anesthesia but before the start of surgery.

None of the patients who responded, however, remembered it afterward. The researchers also noted that there are no known long-term problems associated with the brief period of awareness captured in this study, and stressed this should not dissuade patients from having surgery that they need to improve their health.

Fortunately, this number is far lower than the approximately 37 percent who were identified in earlier studies, using a similar measurement technique, as reporting awareness of a stimulus while under general anesthesia.

The new research, led by Dr. Robert Sanders of the University of Wisconsin School of Medicine and Public Health, was published this week in the Online First edition of *Anesthesiology*, the peer-reviewed medical journal of the American Society of Anesthesiologists. The study was conducted at six sites around the world (Madison, Wis.; Ann Arbor, Mich.; Hamilton, New Zealand; Aachen, Germany; Liege, Belgium; and Groningen, The Netherlands.).

The researchers wanted to find out how often patients were responsive following intubation in routine practice.

To gauge awareness, the research teams used the "isolated forearm technique," in which patients are given a verbal command to move the hand of a tourniquet-isolated arm. This technique gives real-time information about whether the patient was conscious; it does not rely on memory. However, the researchers said their estimate of 4.6 percent could be considered conservative because some patients who are conscious may still fail to respond to the command even though they hear it.

"This was the first multi-institution collaboration investigating the use of the isolated forearm technique," said Sanders, assistant professor of anesthesiology at UW-Madison. "One key feature is that the anesthetic technique was left to the anesthesiologist's discretion. We wanted to look at consciousness in routine clinical practice."

In general, responders were younger than non-responders and they were more lightly anesthetized. The age range for the entire group was 18 to 88 years old.

"Although we view such consciousness during surgery as an important issue, we urge caution in the interpretation of these results," said Sanders. "We looked at a very brief 'snapshot' of the time patients spend under anesthesia. In addition, these patients likely had very different experiences from those who report being awake but unable to move or speak during surgery."

Sanders added: "Patients expect to be unaware of [surgery](#) or any external stimuli during [general anesthesia](#), and we're keen to establish anesthetic techniques that ensure we meet that expectation."

The findings suggest that a single IV injection of anesthetic to drift patients to sleep may not always be effective in preventing patients from regaining consciousness following intubation. Sanders said in future

research his team will look in greater detail at the variables that might result in [patients](#) becoming conscious and ways we can prevent this from happening.

Provided by University of Wisconsin-Madison

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