

# When stroke patients undergo surgery to remove blood clots, what anesthesia works best?

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In carefully selected patients, minimally invasive surgery is enabling physicians to stop strokes in their tracks.

And as more stroke patients undergo such procedures, physicians are debating the best way to anesthetize them. Should patients be put under general anesthesia, rendering them unconscious and motionless? Or should they undergo conscious sedation, in which they remain conscious, but are sedated and do not feel pain?

In the September, 2015 issue of the *Journal of Stroke and Cerebrovascular Diseases*, Loyola University Medical center anesthesiologists W. Scott Jellish, MD, PhD and Steven B. Edelstein, MD, detail the pros and cons of general anesthesia and conscious sedation. Dr. Jellish is a professor in and chair of the Department of Anesthesiology of Loyola University Chicago Stritch School of Medicine. Dr. Edelstein is a professor of and medical director for Perioperative Services in Loyola's Department of Anesthesiology.

Drs. Jellish and Edelstein conclude that regardless of which approach is used, an anesthesiologist or anesthesia care team should be present to provide sedation, [deep sedation](#) or general anesthesia.

The neurointerventionalist is fully focused on the procedure and in many instances, not adequately directing the conscious sedation, Drs. Jellish

and Edelstein write. "The anesthesia team is better equipped to handle procedural complications, hemodynamic control and airway emergencies that could occur during these endovascular procedures in critically ill patients."

About 85 percent of strokes are ischemic, meaning they are caused by clots that block blood flow to the brain. The clot-busting drug tPA can restore blood flow, but it does not always work. In such cases, a new minimally invasive device called a stent retriever can be used to remove a clot. This [minimally invasive treatment](#) is known as endovascular therapy.

The physician inserts a catheter in an artery in the groin and guides it through various blood vessels up to the brain. The stent retriever is attached to a wire, which is guided through the catheter up to the blood clot. (A stent retriever is a self-expanding mesh tube, similar to stents used in heart patients.) When the stent retriever expands, it pushes the gelatinous blood clot against the wall of the blood vessel, immediately restoring blood flow. The stent retriever then is used to grab the clot and pull it out.

The paper by Drs. Jellish and Edelstein makes the case for both sedation and general anesthesia.

## The case for sedation

- Several retrospective studies have found that outcomes, including in-hospital mortality and pneumonia, appear better with sedation than with general anesthesia.
- Under [conscious sedation](#), there is greater stability of blood pressure and blood flow.
- At a time when every minute counts, a delay may occur while waiting for an anesthesia care team to be put in place. After an

ischemic stroke, about two million nerve cells die every ten minutes until [blood flow](#) is restored.

- Because the patient is conscious, it is possible to monitor the patient's neurologic status during the procedure, and make adjustments if necessary.

## The case for general anesthesia

- The patient is completely immobilized. "Immobility is extremely important when using small catheters in very complex locations such as the brainstem," Drs. Jellish and Edelstein write.
- The inhaled anesthetic drugs used in [general anesthesia](#) may provide neuroprotective effects.
- The inhaled drugs also can be used to control blood pressure.
- General anesthesia provides the ability to have a secured airway and to control carbon dioxide levels in the blood.

Provided by Loyola University Health System

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