

Surgery risks go up depending upon the anesthesiologist's workload

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Most major surgeries would not be possible without anesthesia to render a patient unconscious and pain free and to ensure that their vital functions—including blood pressure, breathing, and heart rate and

rhythm—remain stable throughout the procedure.

As the demand for such surgical care grows, many clinicians, including [anesthesia](#) care teams, are being asked to take care of more patients, all while maintaining [patient safety](#).

An anesthesia clinician—a certified registered nurse anesthetist, certified anesthesia assistant, anesthesiology resident or anesthesiologist—is continuously present in the [operating room](#) and delivering important care during every surgery requiring anesthesia. However, it is not uncommon to have one anesthesiologist directing the anesthesia care delivered by other anesthesia clinicians for multiple surgical cases at a time, according to Sachin Kheterpal, M.D. M.B.A., associate dean for Research Information Technology and professor of Anesthesiology at Michigan Medicine.

A new study appearing in *JAMA Surgery* from a team at the University of Michigan examines whether the number of overlapping procedures managed by the anesthesiologist increases the risk of death or complications after surgery.

Using data from the Multicenter Perioperative Outcomes Group electronic health record registry, the team investigated surgical procedures that involved an anesthesiologist directing a CRNA or an anesthesiology resident. This anesthesia care team model is the most common model used to deliver anesthesia in the United States.

Focusing their analysis on cases with CRNA involvement and minimal anesthesiology resident involvement, the authors looked at data from more than 570,000 surgical cases at 23 hospitals in the United States between 2010 and 2017.

They identified patients with similar demographics and health statuses

who underwent surgical cases of various types, including general, gynecologic, neurologic, otolaryngologic, orthopedic, urologic and vascular procedures. For each patient, they calculated the average number of concurrent surgeries that were managed by that patient's anesthesiologist during the patient's procedure. They then compared instances where the anesthesiologist was directing one, between one to two, two to three, or three to four cases at a time.

Overall, 5.19% of cases resulted in some form of post-surgical complication (30-day mortality or one of six major surgical morbidities: cardiac, respiratory, gastrointestinal, urinary, bleeding, and infectious complications).

When compared to an anesthesiologist directing anesthesia for one to two overlapping surgeries, directing anesthesia for two to three or three to four overlapping surgeries led to an increase in the rate of morbidity and mortality. Instances where the anesthesiologist was directing three to four surgeries at a time had a complication rate of 5.75%, a 14% increase compared to the complication rate of 5.06% for one to two overlapping surgeries.

"Anesthesiologists have been saying for a long time that covering four rooms is possible but should be reserved for situations where we think it's safe," said Kheterpal. In fact, U-M Health reserves this model for rare situations. "We now have evidence to support that idea that increasing overlapping responsibilities may have some potential downsides that balance the advantages of potential cost savings and access to care."

The team notes that the study has several limitations, including the fact that the data analysis was limited to specific types of surgeries and may not reflect outcomes for all surgeries. Michael Burns, M.D., Ph.D., with the Department of Anesthesiology, notes, "While these results are

important, they are limited to the data that was available in the study: anesthesia care team models with a single anesthesiologist directing up to four overlapping surgeries."

"Millions of patients receive care from an [anesthesiologist](#) directing more than two overlapping anesthetics," noted Kheterpal. "Addressing any differences in care underlying the observed differences in outcome could reduce adverse events for hundreds of thousands of patients."

And while Kheterpal acknowledges that more research is needed to replicate and further explore the differences found in this study, he does have advice for families who may be concerned about the increased risk: "If you are having high risk [surgery](#) or you are medically complex patient, it may be prudent to ask your anesthesia care team about their typical anesthesia care processes."

More information: Association of Anesthesiologist Staffing Ratio With Surgical Patient Morbidity and Mortality, *JAMA Surgery* (2022). DOI: [10.1001/jamasurg.2022.2804](https://doi.org/10.1001/jamasurg.2022.2804)

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