

Researchers find that even mild pulmonary complications after surgery can pose major risks

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Researchers at the University of Colorado Anschutz Medical Campus, along with seven other major institutions, have found that even mild postoperative pulmonary complications (PPCs) are significantly associated with increased death within the first week after surgery.

The study, which appeared online today in the journal *JAMA Surgery*, examined 1,202 patients who underwent abdominal, orthopedic, neurological and other procedures under [general anesthesia](#) for at least two hours.

"We found that patients with one or more PPCs, even mild, had significantly increased intensive care unit admission, ICU/hospital length of stay and early postoperative mortality," said Ana Fernandez-Bustamante, MD, PhD, associate professor of anesthesiology at the University of Colorado School of Medicine. She and Marcos Francisco Vidal Melo, MD, PhD, associate professor at the Massachusetts General Hospital, Harvard University, are the lead authors of the article.

Current estimates suggest that there are over a million PPCs each year in the U.S. resulting in 46,200 deaths and 4.8 million hospitalizations days. Most of these PPCs are considered mild (i.e. needing prolonged supplemental oxygen), difficult to measure and often ignored in clinical studies.

Fernandez-Bustamante and her colleagues, including Karsten Bartels, MD, assistant professor of anesthesiology at CU Anschutz, set out to understand these PPCs better and how to address them.

They studied patients classified as "physical status 3" by the American Society of Anesthesiologists, meaning they suffered severe systemic disease.

The patients underwent prolonged, non-cardiac or thoracic [surgery](#) with general anesthesia and mechanical ventilation.

A third of them developed one or more PPCs after surgery. These patients were often older with hypertension, cancer or chronic [obstructive pulmonary disease](#).

Severe complications were rare. The most common complication was simply requiring oxygen for longer than 24 hours after the operation. That was followed by atelectasis (or portions of the lungs being partially collapsed).

But even these relatively mild complications were associated with significantly increased hospital stay, admission to the ICU or mortality within the first week after surgery.

And this was observed at seven large American academic hospitals.

"This tells us that care could be improved," Fernandez-Bustamante said. "If we could understand better and prevent mild PPCs we could improve the recovery of thousands of patients."

Doctors know that giving patients too many fluids or too big breaths during anesthesia can cause pulmonary problems afterwards.

Fernandez-Bustamante said that paying more attention to preventing atelectasis, for example, before, during and after surgery, could reduce some of them, improve oxygenation and prevent the need of oxygen therapy and hospital stay.

She noted that physicians must also optimize fluids and pain control, and minimize blood loss during operations to prevent PPCs. Doing all of this, she

said, could improve patient outcomes and result in shorter hospital stays.

"Surgeons, anesthesiologists, nurses, respiratory therapists, and others, must collaborate better to make this successful. And of course patients need to know they play a critical role in their own recovery. We must work with them closely before, during and after surgery," Fernandez-Bustamante said. "If we want [patients](#) to have less pulmonary complications, we need a truly comprehensive approach to this problem."

Provided by CU Anschutz Medical Campus

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