

# Research finds that life-saving intervention is not risk-free in pediatric patients

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Blood transfusion is a vital and lifesaving intervention in a broad range of scenarios, from trauma response to cancer treatment. However, it is not entirely without risk.

Research recently published in the *Journal of Pediatric Hematology/Oncology* found that [blood transfusion](#) is associated with adverse outcomes—including infection and higher rates of tumor recurrence—in pediatric solid tumor oncology patients following surgical removal of the tumor.

"Blood transfusion is obviously hugely important when used in the appropriate clinical scenario, but there are some downsides," says study author Shannon Acker, MD, an assistant professor of pediatric surgery in the University of Colorado School of Medicine. "It's pro-inflammatory and suppresses the [immune system](#) because your body reacts to foreign tissue. It can be a vital intervention, but I think we're starting to be a little more thoughtful about giving patients blood products."

## Understanding pediatric blood transfusion

Acker and her co-researchers pursued this research, in part, because while the effects of packed [red blood cell](#) (PRBC) transfusion in adult populations have been widely studied, data are sparser for pediatric patients.

"It's fairly well-documented that in [adult patients](#), perioperative blood transfusion for solid tumor resection is associated with certain adverse outcomes," Acker explains. "But pediatric cancers are more rare, so they're more challenging to study. We need more data to understand whether what we know to be true in adult cancers is also true in pediatric cancers."

Drawing retrospective data from Children's Hospital Colorado pediatric patients over 11 years, Acker and her co-researchers included malignant solid tumors removed by surgeons across all surgical disciplines. Acker acknowledges that grouping different types of cancer into one study

lessens the validity of the research because different cancers have different outcomes, "but we needed a place to start so we can begin working toward more collaborative, multi-center pediatric oncology research," she says.

## Higher rates of complications

Analyzing data from more than 360 [pediatric patients](#) who underwent tumor resection during the 11-year research period, Acker and her co-researchers found that 194 received a blood transfusion within 30 days of surgery.

By analyzing available data, they saw that children who received a blood transfusion had higher rates of post-surgery infectious complications, a shorter disease-free interval, and higher rates of tumor recurrence. They also adjusted for receiving pre-operative chemotherapy and still found that blood transfusion was associated with higher rates of post-operative infectious complications and a shorter disease-free interval.

Further, researchers found no relationship between tumor type and rate of infectious complications or disease-free interval.

## Providing the best patient care

An aim of the research and its findings is to continue supporting and facilitating conversations and practices about patient care. "Packed [red blood cells](#) carry oxygen to the body and help tissues get the oxygen that they need," Acker says. "They're essential. It used to be common practice that if a surgeon was taking out a [tumor](#) and the patient was losing blood, they would immediately get two units."

She adds that blood transfusion now is recognized as "not a totally benign intervention, so instead of immediately giving a patient two units,

we start with one and see if that leads to an appropriate response. Our research shows that each additional unit increases risk of [adverse outcomes](#), so we want to continue being thoughtful in using this intervention."

Acker adds that a further goal of the research is to work with members of pediatric oncology surgical consortiums to draw data from national and international centers. "The data we have are good, but I don't think they're enough to convince people to change institutional protocols. If we can get more validated, multi-center data, we can begin to look at a more granular level at timing of transfusions and types of cancers so we can continue providing the best patient care."

**More information:** Shannon N. Acker et al, Blood Transfusion is Associated With Adverse Outcomes in Pediatric Solid Tumor Oncology Patients Following Tumor Resection, *Journal of Pediatric Hematology/Oncology* (2022). [DOI: 10.1097/MPH.0000000000002530](https://doi.org/10.1097/MPH.0000000000002530)

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