

Quick antibiotics reduce PICU needs and mortality of pediatric cancer patients

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A University of Colorado Cancer Center study published in the journal *Pediatric Blood & Cancer* shows that pediatric cancer patients who receive antibiotics within 60 minutes of reporting fever and showing neutropenia (low neutrophil count), go on to have decreased intensive care consultation rate and lower mortality compared with patients who receive antibiotics outside the 60-minute window.

"We're talking about kids who have gone home after chemotherapy and then a parent calls the hospital reporting a fever. The question is can we get the patient back to the hospital, then get a white [cell count](#), and get [antibiotics](#) on board when needed all within an hour of their arrival? It's a huge challenge. This study shows that it's important we make it happen: there's less intensive care and fewer fatalities for kids who get antibiotics sooner," says Joanne Hilden, MD, investigator at the CU Cancer Center, director of clinical services for pediatric oncology at Children's Hospital Colorado, and the paper's senior author.

Specifically, the paper shows in a sample of 220 children that mortality was 3.9 percent for patients who received antibiotics outside 60 minutes and only 0.7 percent for those who received antibiotics within the hour.

The study took place within efforts of Children's Hospital Colorado to improve time-to-delivery of antibiotics in cases of fever and low white blood cell count in [pediatric cancer](#) patients, which at study outset required an average 150 minutes. The paper describes procedural changes including prescribing antibiotics upon a pediatric cancer

patient's arrival to the hospital, holding that order, then allowing the delivery of antibiotics to start immediately after learning the results of neutrophil count testing (eliminating the need to find a prescriber once the white blood cell count was known).

Another intervention describes speeding the time needed to determine the neutrophil count. Traditionally, determining neutropenia requires a full white blood cell count followed by "differential" (counting the percent neutrophils) by a human technician. But human verification reverses the preliminary, machine results in less than 0.5 percent of cases. Analysis showed that the benefit of speed outweighed the risk of administering unneeded antibiotics in these very few cases. Depending on preliminary rather than technician-verified results of white cell counts reduced the time of testing from 45 minutes to twenty.

"Another thing we show is that just increasing the awareness of how important it is to get antibiotics on board quickly in these cases speeds delivery," Hilden says.

Taken together, along with changes to clinic flow procedures that included notifying the full care team as soon as the family is advised to come into the hospital and a STAT intake, Children's Hospital Colorado was able to reduce its time to delivery of antibiotics to a median 46 minutes, with nearly 100 percent of pediatric patients with fever and neutropenia receiving antibiotics within 60 minutes.

"We're a top children's cancer institution where we deliver medicines based on the latest molecular genetics. And even if you get all that stuff right, you still have to take care of the patient's body during treatment. Nothing makes you madder than losing to infection," Hilden says. "Only eleven percent of pediatric cancer patients with fever and neutropenia have serious complications. That's low. But we can make it zero, and this study shows that getting antibiotics onboard quickly goes a long way

toward that goal."

Provided by University of Colorado Denver

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