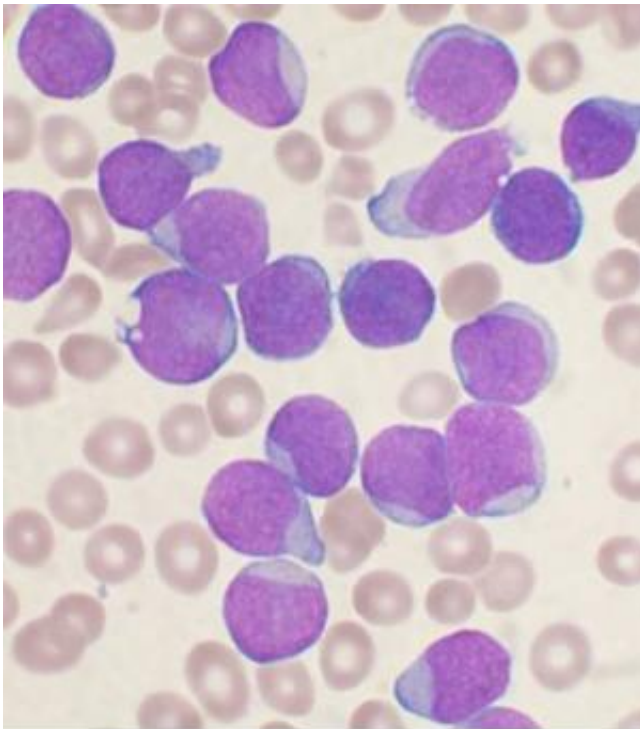


# Children with childhood leukemia benefit from prophylactic antibiotics

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A Wright's stained bone marrow aspirate smear from a patient with precursor B-cell acute lymphoblastic leukemia. Credit: VashiDonsk/Wikipedia

Prophylactic antibiotics significantly reduce the risk of serious bacterial infections in children during the critical first month of treatment for acute lymphoblastic leukemia (ALL), the most common childhood cancer, according to a U.S. and Canadian study led by investigators from Dana-Farber/Boston Children's Cancer and Blood Disorders Center.

While the overall cure rate for ALL is high, about one to two percent of children with this diagnosis die during the first month of therapy from treatment complications, primarily infection-related.

The investigators, reporting their findings at the 57th annual meeting of the American Society of Hematology (abstract #249), found that prophylactic antibiotic treatment reduced the incidence of infection by approximately 60 percent compared to historic controls.

Both ALL and the chemotherapy used to treat it impact patients' immune systems, leaving them vulnerable to infection by a variety of bacteria. The risk of infection is particularly high during the first or "induction" phase of ALL treatment, when oncologists attempt to push the leukemia into remission.

"Children who develop bacterial infections during induction can become severely ill and often need to be admitted to the intensive care unit," said study senior investigator Lewis B. Silverman, MD, clinical director of the Hematologic Malignancies Center at Dana-Farber/Boston Children's and principal investigator of the Dana-Farber Cancer Institute (DFCI) ALL Consortium clinical trials group. "As a group, we realized that there was great variability among our institutions in terms of the management of leukemia patients who develop a fever. This study was designed to ask whether uniform guidelines for [antibiotic prophylaxis](#) and fever management could prevent infection-related morbidity and mortality in our patients. It was not clear, prior to starting the study, whether such a strategy would succeed, or whether the use of prophylaxis might increase the incidence of antibiotic-resistant infections or the frequency of fungal infections."

To determine whether preventive antibiotic treatment could reduce the rate of bacterial infections during induction therapy, the DFCI ALL Consortium added universal antibiotic prophylaxis to its 11-001

treatment protocol for pediatric ALL. Clinicians at nine sites participating in the consortium enrolled 229 newly diagnosed children with ALL on the protocol between 2012 and 2015. All of the patients received antibiotics through the entirety of their induction phase of treatment, whether or not they developed a fever. The research team compared the infection rate seen on protocol 11-001 with that of patients treated under the consortium's previous 05-001 ALL treatment protocol, which called for antibiotics to be administered only in response to fever and did not specify the duration of antibiotic treatment.

The study's data indicate that the prophylactic strategy did indeed reduce infection risk. The proportion of patients given [prophylactic antibiotics](#) who experienced at least one infection during induction-phase therapy on protocol 11-001 was 13.1 percent, approximately 50 percent lower than the proportion among patients treated on protocol 05-001 (26.6 percent). The incidence of bacterial infection among children on protocol 11-001 was 9.9 percent, approximately 60 percent lower than that among children on protocol 05-001 (24.7 percent).

The study team noted no significant differences in the rates of other [treatment](#)-related mortality, fungal infection or Clostridium difficile infection between the two protocols.

"While larger, randomized clinical trials are needed to confirm these findings, these are very exciting results," said Silverman. "The use of antibacterial prophylaxis appears to have made a profound difference for our [patients](#)."

Provided by Dana-Farber Cancer Institute

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