

Outpatient bloodstream infections costly for pediatric transplant and cancer patients

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Pediatric stem cell transplant and cancer patients often are discharged from the hospital with an external central venous line for medications that parents or other caregivers must clean and flush daily to avoid potentially life-threatening infections. If an outpatient develops a bloodstream infection associated with the central line, research from Dana-Farber/Boston Children's Cancer and Blood Disorders Center finds, the median charges to treat it total \$37,000 for a hospital stay of six days for young patients whose disease treatments have weakened their immune systems and infection-fighting abilities.

The results, published online by *Pediatric Blood & Cancer*, are part of the second phase of a collaborative effort among children's hospitals to reduce central-line-associated [bloodstream infections](#) or CLABSIs. In the first phase, members of the Children's Hospital Association Childhood Cancer and Blood Disorders Network reduced inpatient CLABSIs by 28 percent in less than three years, according to results published in 2014 in *Pediatrics*. Because a large portion of pediatric oncology and stem cell transplant patients' care occurs in ambulatory settings, the consortium is now focusing on understanding and reducing CLABSIs that originate in the home, between outpatient clinic visits.

"This issue has resonance beyond the pediatric stem cell transplant and oncology patient population," says Amy Billett, MD, senior author of the paper and director of safety and quality at Dana-Farber/Boston Children's. "At a time when many aspects of care are being shifted to the home and of heightened attention to safety and cost, this is the new

frontier. What we learn about preventing outpatient bloodstream infections in these patients could have broad relevance."

To determine the economic and hospitalization impact of ambulatory CLABSIs, researchers retrospectively analyzed data on outpatient bloodstream infections at Dana-Farber/Boston Children's that occurred between January 1, 2012 and December 31, 2013 and resulted in hospitalization. They analyzed 74 bloodstream infections in 61 patients, of which 69 percent were classified as CLABSIs. In 43 percent of the cases, the patient's central line had to be surgically removed, and in 15 percent of cases, the child was transferred to the intensive care unit. Four patients died during hospitalization, with three of the four deaths associated with the infections.

Most hospitalizations analyzed - 62 - were due solely to bloodstream infections; the remainder involved at least one other medical issue. The median charges for children treated only for a bloodstream infection were \$36,000 for a six-day [hospital stay](#). For children hospitalized for an infection plus one or more additional medical issues, the median charges totaled \$40,000 for a seven-day hospital admission.

"Behind these metrics are real and serious risks to patients' health," says Chris Wong, MD, the paper's lead author and a pediatric oncologist at Dana-Farber/Boston Children's. "The bottom line is that the dollar cost and lengthy hospital stays signal complications that could become life-threatening or delay treatment of the children's cancer. Reducing these infections is important both for cost containment and quality of care."

Many pediatric stem [cell transplant](#) and oncology outpatients have central lines to deliver chemotherapy and other medications. These include tunneled external catheter lines inserted in the chest and external peripherally inserted central catheters (PICC lines) inserted in the upper arm. Other children receive their medication through ports, which are

fully implanted lines cared for by nurses. In Dana-Farber/Boston Children's outpatient clinic, children with external lines account for one-quarter of its so-called line days and three-quarters of its outpatient CLABSIs, the center has found.

To reduce outpatient CLABSIs, Dana-Farber/Boston Children's has added staff and developed other resources to expand training and support for parents and others providing in-home line care for children with external central lines.

"We're trying to get our patients and line caregivers to be in the sweet spot," says Billett. "They have the desire to do good line care. They have the ability - cognitive and physical - to do good line care. They have the opportunity to do good line care: They have the right supplies; they have a clean surface to work on. If we can get everyone in this sweet spot, we can reduce preventable infections and the harm they can cause."

More information: Chris I. Wong Quiles et al, Health care institutional charges associated with ambulatory bloodstream infections in pediatric oncology and stem cell transplant patients, *Pediatric Blood & Cancer* (2016). [DOI: 10.1002/pbc.26194](https://doi.org/10.1002/pbc.26194)

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