Becoming Parent and Nurse: High-Fidelity Simulation in Teaching Ambulatory Central Line Infection Prevention to Parents of Children with Cancer

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Background: Ambulatory central-line infections in children with cancer are life-threatening. Infections are two to three times more frequent in outpatients than inpatients, for whom evidence-based bundles have decreased morbidity. Most cancer care now takes place at home, where parents perform many of the same tasks as nurses. However, parents often feel stressed and unprepared. To address this, high-fidelity simulation, which has been effective for teaching novice nurses, was evaluated for parent central-line education.

Methods: In a feasibility study using a pretest/posttest design, after completion of usual central-line education, parents participated in a high-fidelity simulation practice session. Parents were assessed in three domains: (1) knowledge of infection prevention; (2) psychomotor skill competence; and (3) ability to recognize health care provider nonadherence to best practices. Parents also completed a 5-point Likert simulation experience survey.

Results: A convenience sample of 17 parents participated between December 2015 and March 2016. Knowledge median scores increased from pre- to posttest from 10 to 15 of 16 points possible (p ≤ 0.001; Wilcoxon signed rank test). Median skills scores increased from pre- to posttest from 8 to 12 points of 12 possible (p ≤ 0.001). Following simulation, median recognition scores increased from 3 to 6 with 6 points possible (p ≤ 0.001). For the parent experience survey, 100% of participants strongly agreed or agreed that simulation was meaningful for learning central-line care.

Conclusions: As an adjunct to usual care central-line education, translation of high-fidelity simulation to parent education is a novel approach that shows promise for improving central-line care at home in children with cancer.

The parents of a child newly diagnosed with cancer are forced to navigate a multitude of overwhelming challenges. In spite of advancements, cancer is still the leading cause of death in children past infancy. Most pediatric oncology patients require central venous access, but in the midst of processing the difficult diagnosis, parents must simultaneously learn to care for central lines and prevent central line–associated bloodstream infections (CLABSIs) at home. There is significant morbidity and mortality associated with CLABSIs in immune-suppressed children. Evidence-based CLABSI prevention bundles have substantially reduced infection rates in pediatric intensive care and oncology inpatient units; however, the likelihood of developing a CLABSI postdischarge increases two- to threefold.

Parents often report feeling stressed and unprepared to assume complicated care for devices such as central lines. As cancer care has shifted to ambulatory settings, parents now provide care once performed exclusively by nurses. Caregivers describe the need to rapidly process an overwhelming volume of information being presented by providers who often overestimate their readiness to assume complex care.

To better understand CLABSI prevention practices at home for pediatric oncology patients, Rinke et al. conducted a survey of 105 parents at our institution—Johns Hopkins (Baltimore). At the time of the survey, it should be noted that CLABSI prevention had been a high priority for our hematology oncology staff since 2009, when we joined more than 30 other pediatric units across the United States as participants in the Children’s Hospital Association (CHA) CLABSI collaborative network; we ended our participation in December 2014. In spite of that effort, Rinke et al. were concerned about the ambulatory infection rates and recognized the need to know more about central-line care at home. Their study identified two concerns relevant to this parent education project. First, they noted that interventions for improving caregiver education are needed. Second, they reported that pediatric oncology patients come into contact with 13 potential settings (such as the emergency room [ER] and radiology) and/or types of health care providers whose compliance with central-line best practices was essential but not guaranteed.

This pressing need to better prepare parents for CLABSI prevention led us to search for a novel approach to improve parent and patient education. Because the stress and anxiety