

# Hematopoietic Stem Cell Transplantation Recipient and Caregiver Factors Affecting Length of Stay and Readmission

Thiruppavai Sundaramurthi, PhD, RN, OCN®, CCRN, Leslie Wehrlen, RN, MSN, OCN®, Erika Friedman, PhD, Sue Thomas, RN, PhD, and Margaret Bevans, PhD, RN, AOCN®, FAAN

Sundaramurthi is a senior clinical research nurse and Wehrlen is a senior nurse consultant, both in the Nursing Department at the National Institutes of Health Clinical Center in Bethesda, MD; Friedman is an associate dean of research and professor and Thomas is a professor emeritus, both in the School of Nursing at the University of Maryland in Baltimore; and Bevans is a nurse researcher in the Nursing Department at the National Institutes of Health Clinical Center.

This research was funded by the Intramural Research Program of the National Institutes of Health, Clinical Center (Clinical Trials Identifier: NCT00766883—Problem-Solving Education for Caregivers and Patients During Stem Cell Transplant).

Sundaramurthi, Wehrlen, Friedman, and Bevans provided statistical support and the analysis. Sundaramurthi, Wehrlen, and Bevans completed the data collection. All authors contributed to the conceptualization and design and manuscript preparation.

Sundaramurthi can be reached at [sundaramurthit@gmail.com](mailto:sundaramurthit@gmail.com), with copy to editor at [ONFEditor@ons.org](mailto:ONFEditor@ons.org).

Submitted December 2016. Accepted for publication February 27, 2017.

Keywords: caregiver; 30-day readmission; length of stay; allogeneic hematopoietic stem cell transplantation

ONF, 44(5), 571–579.

doi: 10.1188/17.ONF.571-579

**Purpose/Objectives:** To evaluate the contributions of patient and caregiver factors to length of stay (LOS) and 30-day readmission status for recipients of allogeneic hematopoietic stem cell transplantation (HSCT).

**Design:** Secondary data analysis from a phase 2 clinical trial.

**Setting:** National Institutes of Health Clinical Center in Bethesda, Maryland.

**Sample:** 68 dyads (N = 136) comprised of patients receiving HSCT and their caregivers.

**Methods:** Multiple linear regression and logistic regression analyses were used to investigate associations between caregiver and patient factors and outcomes.

**Main Research Variables:** Patients' initial LOS, 30-day readmission, and demographic and disease characteristics; caregiver demographic factors, health problems, psychological distress, burden, and self-efficacy.

**Findings:** Twenty-five patients were readmitted within 30 days after hospital discharge following their initial hospitalization for HSCT. LOS was 34% longer for patients with infection than patients without infection. Patients with grade 2 or greater acute graft-versus-host disease (GVHD) stayed longer compared to patients with no or mild acute GVHD. Patients who had nonspousal caregivers stayed longer than patients with spousal caregivers. Infection was significantly related to readmission.

**Conclusions:** Knowledge regarding factors associated with increased LOS and 30-day readmission can help nurses and transplantation team members anticipate the healthcare needs of patients receiving HSCT, improve outcomes, and decrease the use of expensive health services.

**Implications for Nursing:** Educating patients and caregivers on infection prevention is critically important to reduce LOS and 30-day readmission after HSCT.

The annual number of allogeneic hematopoietic stem cell transplantation (HSCT) recipients in the United States is steadily increasing. Multiple myeloma and lymphoma are associated with 56% of all HSCTs, whereas acute leukemia and myelodysplastic syndrome are the most common indications for allogeneic HSCT (D'Souza & Zhu, 2016). HSCT has the ability to cure a variety of diseases, but the procedure is associated with complications related to the donor type (autologous, related or unrelated allogeneic), pretransplantation conditioning regimen (full- or reduced-intensity myeloablation), and the source of stem cells (bone marrow, peripheral blood cells, or cord blood cells) (Rimkus, 2009). In the first 100 days after transplantation, the patient can experience symptoms such as fatigue and diarrhea, as well as life-threatening complications such as infection, graft-versus-host disease (GVHD), and organ failure (Arnaout et al., 2014; Bevans, Mitchell, & Marden, 2008). The number of complications, increased mortality risk, and altered immune function