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A Retrospective Review of Nutritional Status as Reflected by Weight Change in Pediatric Patients Post Allogeneic Matched Family Stem Cell Transplant

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Topic Significance & Study Purpose/Background/Rationale: Background: Stem cell transplant (SCT) is a treatment used for pediatric patients with both malignant and nonmalignant diseases. SCT can offer a cure for these patients; however, the intensive therapy can affect nutritional status due to multiple factors impacting caloric needs, including nausea, mucositis, diarrhea, fever, infection and graft versus host disease. Managing the complex nutritional needs is challenging in this pediatric population. Every patient receives a nutrition consult during admission and most receive PN but long term assessment of nutritional status is not routinely done.

Methods, Intervention, & Analysis: Methods: A retrospective chart review was carried out at Dana Farber/Boston Children's Hospital in consecutive patients who underwent a matched related donor SCT for treatment of hemoglobinopathy (sickle cell and thalassemia) (n=12) or acute leukemia (n=46) between the years 2007-2012. Z-scores were used to indicate the distance from the population mean by standard deviations: positive scores being above the mean and negative scores being below the mean. The weight z-scores for each patient were recorded at different intervals: the day of transplant (day 0), day 100 and one year post transplant. These values were compared to determine the longitudinal impact of SCT on nutritional status.

Findings & Interpretation: Results: Four different groups were defined to characterize the change in weight z-score from day 0 to day 100 and day 0 to one year: negative z-score at day 0 to negative at day 100 or one year (neg|neg), negative at day 0 to positive at day 100 or one year (neg|pos), positive at day 0 to negative at day 100 or one year (pos|neg), and positive at day 0 to positive at day 100 or one year (pos|pos). Of the 30 leukemia patients who were positive (+) pre SCT, over half (18) were (+) at day 100 and of the 23 patients followed until one year, 18/23 remained (+). For nonmalignant patients, 3 of the 4 that were (+) at day 0 were (+) at day 100 and of the 3 patients followed until one year, 3/3 remained (+). Those patients who were well nourished at day 0 as assessed by (+) z-scores tend to maintain this status at both early and late post SCT time points.

Discussion & Implications: Conclusion: SCT is known to impact nutrition but the degree and duration of that impact is not well understood in the pediatric allogeneic population. We have shown that pre-SCT nutritional status, whether a patient is appropriately nourished or malnourished, makes a major contribution to nutritional status both short term (day 100) and long term (one year) after transplant. Overall, well nourished patients with leukemia or hemoglobinopathies tend to maintain their nutritional status, whereas malnourished patients do not easily make nutritional gains. Thus dedicated efforts must be made to the vulnerable group of patients beginning the transplant process in a poor nutritional state to optimize transplant outcome.

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Comparing the safety and efficacy of red blood cell transfusion dose in hematopoietic stem cell transplant patients: single versus double unit transfusions

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Topic Significance & Study Purpose/Background/Rationale: Until recently, the national standard practice for blood transfusions in bone marrow transplant patients was two units of red blood cells (RBCs) per transfusion episode. This practice was called into question due to safety concerns, suggesting that one unit of RBCs per transfusion episode may be an equivalent or even safer and less costly practice (assuming factors such as amount of bleeding and hemoglobin level are equal). Following a thorough review of existing blood management practices and review of the literature, our academic medical center changed practice to routinely transfuse one unit of RBCs per low hemoglobin (7-8 g/dL) episode if certain clinical criteria were met. Following IRB approval, a retrospective medical record review began to evaluate this practice change among two groups of hematology-oncology patient populations (allogeneic and autologous bone marrow transplant). Patient records from these two groups of patients are being evaluated before and after the practice change (one vs two units of RBCs/transfusion) looking at average units of blood products transfused per patient, impact on length of stay, and estimate of nursing time costs. The project is expected to generate new knowledge regarding safe blood management practices in hematology oncology patients.

Methods, Intervention, & Analysis: The project is using the hematology oncology inpatient unit log of admissions and discharges to identify adult allogeneic and autologous bone marrow transplant patients who received a blood transfusion for a hemoglobin of 7-8g/dl and hematocrit above 21%; and were not actively bleeding, septic, experiencing a major infection, or pregnant. Patient data are being obtained from the University HealthSystem Consortium (UHC) database. 400 cases are being enrolled, 200 from pre-practice change (7-1-2009 to 6-30-2011) and 200 from post-practice change (9-1-2011 to 8-31-2013). A two-month gap was purposefully included between the two time periods to allow for full transition to the new practice standard of one unit of RBCs/transfusions. Data thus far suggests a reduction in red blood cell utilization at an average of 1.3 units per hospital discharge. Based on these utilization trends, we are estimating a cost savings of at least \$1300 per month just in purchase cost (\$200 per RBC unit X 1.3 units per discharge X an average of 5 patients/month). Additionally, we are estimating a savings in nursing hours of approximately 13 hours per month (2 hours per RBC transfusion X 1.3 units per discharge X an average of 5 patients/month).

Findings & Interpretation: Preliminary project findings indicate promise for the standard practice of transfusing one unit of RBCs per low hemoglobin episode for allogeneic bone marrow transplant and autologous bone marrow transplant patients. After data collection is complete, formal statistics will be completed to compare the mean number of RBC units between the practice of routinely transfusing 1 RBC unit and the practice of routinely transfusing 2 RBC units, as well as comparing length of stay and costs. Early conclusions suggest the goal of improving the safety of blood transfusions and preserving a precious resource might be achieved with this important practice change for two groups of oncology patients. These results will inform other practice settings to improve their use of blood management products for oncology patients and promote patient safety and cost-effective practices. Use of the UHC database as a meaningful resource for practice improvement projects and research studies will be highlighted. Continued evaluation and ongoing improvement of blood management practices at the project site will be discussed with suggestions for other settings and practices.

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Discussion & Implications: This will help improve the safety of blood transfusions. It could guide future studies with baseline information from this transfusion practice change. Other oncology areas could adopt a similar practice change, educate patients and clinicians on safe transfusion practices.

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Practices and Experiences of Nurses Working on a Pediatric Bone Marrow Transplant Unit

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Topic Significance & Study Purpose/Background/Rationale: Bone marrow transplant (BMT) is an intensive and complex culture. The BMT environment is associated with multiple stressors for employees that often result in turnover, burnout, compassion fatigue, anxiety and emotional exhaustion. Leininger's Culture Care Diversity and Universality theory guided this research and has been used to study organizational culture. The purpose of this study was to explore the experiences, care meanings, and practices of nurses working on a pediatric BMT unit. The goal is to provide meaningful ways to care for nurses working with children receiving a bone marrow transplant.

Methods, Intervention, & Analysis: This Ethnonursing study utilized focus groups as a data collection technique to foster discussion and richness. Data were collected until saturation was met. Registered nurses recruited from the unit were grouped as experienced (greater than 2 years experience, n=11) or less experienced (less than 2 years experience, n=13). Field notes were used to capture context and observations from group sessions and the care environment. Focus group discussions were recorded, transcribed, and coded. Code words were identified from the data with assistance of NVivo qualitative data analysis software. Patterns and finally themes emerged from the data that explained nursing culture on the BMT unit.

Findings & Interpretation: There were four themes of culture care for BMT nurses: 1. experiencing stressful situations, 2. growing and developing personally and professionally, 3. providing trustworthy and respectful care, 4. acquiring meaningful coping skills. Many stressors identified by staff align with the literature such as interprofessional communication, moral/ethical conflict, patient death, and workload. The majority of coping skills were personal in nature. Although not generalizable, results may be transferable to similar populations and environments.

Discussion & Implications: Interventions to promote healthy, and restructure unhealthy, stress management techniques and coping skills should be designed and tested in this population. Interventions aimed at interprofessional communication and professional development may also be aid in promoting care.