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BMT Tandem

Nursing

Posters

Improving Contact Precautions Compliance on Bone Marrow Transplant ICU

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Topic Significance & Study Purpose/Background/Rationale: Background: Infections caused by multi-drug resistant organisms (MDRO) have become increasingly prevalent in hospitals over the last decade. More than 70% bacteria that cause hospital-acquired infections are resistant to at least one drug commonly used to treat these infections. Contact precautions are important in preventing the spread of MDROs; however, compliance in intensive care units (ICU) is known to be low. Contact precautions compliance consists of hand hygiene before entering patient room and upon exiting patient room as well as utilizing gloves and gowns. Purpose: To assess if contact precaution compliance improves among Bone Marrow Transplant (BMT) ICU staff after providing education.

Methods, Intervention, & Analysis: Methods: Physicians and nursing staff completed a questionnaire assessing contact precaution knowledge prior to an oral educational offering. Contact precautions compliance audits utilizing the CDC MDRO form were performed three months using 30 observations per shift each month on a University hospital 16-bed BMT ICU. This tool evaluated compliance with hand washing on room entry and exit as well as gowning and gloving while in patient room. Staff were considered either compliant or noncompliant with the contact precautions as a whole.

Findings & Interpretation: Results: 70% of nursing staff and physicians completed assessment questionnaires with a mean score of 93.3%. Compliance with contact precautions was 14% at baseline, 36.6% first month, 61.7% second month, and 88.3% the third month. Staffing for acuity was also monitored. As acuity went down with improved staffing, contact precautions compliance went up.

Discussion & Implications: Conclusions: Contact precautions compliance gradually improved during the study as nurse and physicians became aware of audits - possibly a "Hawthorne Effect." Compliance slowly improved while acuity was high; however, significant improvement was noted as acuity dropped. Improved contact precautions compliance was not believed to be education related. Additional studies are needed to evaluate the effect patient acuity and staffing have on contact precautions compliance.

Empowered Bedside Bone Marrow Transplant Nurses: The Key to Patient Satisfaction

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Topic Significance & Study Purpose/Background/Rationale: Background: A patient's perception of his or her hospital stay is directly impacted by the nursing care he or she receives. With value-based purchasing on the horizon, the Centers for Medicare and Medicaid will use patient satisfaction scores to determine reimbursement. Psychological empowerment is a perception that one has control of one's work environment with one's values aligned with the organization. Structural empowerment is the ability for the organization to offer access to information, resources, support, and work opportunity. Psychological and structural nursing empowerment directly impact patient satisfaction, reimbursement, and organizational commitment.

Methods, Intervention, & Analysis: Methods: This study looked at retrospective cross-sectional data of nursing empowerment and patient satisfaction at a tertiary hospital 16 bed Bone Marrow Transplant Inpatient Unit. The data collection review was from October 2012 to October 2013.

Findings & Interpretation: Results: The mean Press Ganey© patient satisfaction score for bone marrow transplant nursing was 95.5%. Average nursing experience was 8 years 10 months with 98% staff retention. More than 75% of staff were engaged in unit based committees that were nurse driven including the Interdisciplinary Shared Governance Congress, Research Committee, Education Committee, and Evidenced-Based Practice Journal Club. 62% of staff were engaged in hospital based committees and participated in providing hospital CEU educational offerings. Nursing abstracts and presentations were accepted to local, state, regional, national, and international conferences.

Discussion & Implications: Conclusions: Empowered nurses are more autonomous in overcoming barriers to patient centered care; and because they focus on service delivery, they partner with the patient to enhance care delivery. Nursing empowerment is directly related to patient satisfaction as well as organizational commitment. Since patient satisfaction is being tied to reimbursement, the engaged and empowered nurse appears to be the key. It is important to establish a unit culture that empowers nursing staff.

A Multi-Disciplinary Approach to Reducing Hospital Acquired C. Difficile in the BMT Patient Population

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Topic Significance & Study Purpose/Background/Rationale: Patients receiving a Blood and Marrow Transplant (BMT) have an increased likelihood of developing Healthcare-acquired (HA) Clostridium difficile (CD). HA CD increases mortality by 4.5% and length of stay by 2.3 days at a mean cost of 6,000 per day. A multi-disciplinary workgroup was organized to identify opportunities for reducing HA CD using DMAIC principles. Nursing representation on this workgroup was essential to educate patients, families, and other members of the health care team of best practices while maintaining these practices during the implementation and control phase. The purpose of the presentation is to present the resulting data of a multi-disciplinary driven team to reduce HA CD in the BMT Patient Population.

Methods, Intervention, & Analysis: Workgroup members met bi-weekly during the Define and Measure Phase of the project to review current projects, best practices, and current infection rate data, that are calculated based on rate per 10,000 patient days. Initially, the BMT unit piloted use of a sporocidal disinfectant without reduction in HA CD. Emphasis was subsequently placed on hand hygiene compliance, anti-microbial stewardship, reduction in use of proton pump inhibitors, development of an enteric contact isolation procedure, utilization of bleach targeting high-touch surface areas, areas with possible contamination, and full discharge cleaning post discharge along with high touch surface quality audits.

Findings & Interpretation: Utilizing a multi-disciplinary approach towards reducing HA CD, there was a 47% reduction in HA CD in our BMT unit, which has been sustainable over time. In reviewing best practices, the CDC and OSHA have guidelines recommend using bleach as a broad spectrum germicide on pathogens such as CD spores.

Discussion & Implications: BMT patients have multi-factorial causes for diarrhea. This multidisciplinary approach successfully reduced the rate of HA CD while expanding practices to the Acute Leukemia Unit and can be used as a model for other BMT Programs.

Medical Oncology Unit's Road to Competence in Autologous Stem Cell Transplant

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Topic Significance & Study Purpose/Background/Rationale: On a 24 bed Blood and Marrow Transplant Unit (BMTU), there are periods of high patient census that make it difficult for the patient to remain in the BMT unit during the transplant process. During these times, lower acuity patients receiving autologous stem cell transplants may be admitted to the medical oncology unit to begin chemotherapy or transferred into the unit to complete the last few days of count recovery. In early 2012, the hematology-oncology unit was designated as the overflow for BMT. A plan was implemented in June 2012 to cross-train hematology-oncology nurses to autologous stem cell transplantation.

Methods, Intervention, & Analysis: 1) All hematology-oncology nurses receive classroom education covering basics of autologous stem cell transplantation, BMTU procedures, and skills review. 2) Each nurse is oriented to autologous stem cell transplantation on the BMT unit by an experienced BMT nurse for six-twelve hour days. The experienced BMT nurse follows a specific check-list designed to introduce the orienting nurse to all aspects of caring for an auto transplant patient. 3) Each nurse must pass a basic knowledge exam and is validated in the infusion of autologous stem cells during the course of orientation.

Findings & Interpretation: All the nurses attending the autologous transplantation education have passed a knowledge based electronic test on the topic. Nurses are currently being oriented to autologous stem cell transplantation as census and staffing allow. Each nurse is skills validated in autologous stem cell infusion at the end of orientation.

Discussion & Implications: The project involves cross-training of existing medical oncology nurses to autologous stem cell transplantation. However, the interventions discussed can be applied to cross-training nurses within a facility to care for a secondary patient population.

Information to Coming BMT Patients - Creating a Web Site

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Topic Significance & Study Purpose/Background/Rationale: Background As transplant coordinators we have the first contact with all Bone Marrow Transplant (BMT) patients referred to our unit. Our experience is that the patients have a lot of questions concerning transplant. Initial information about BMT is given at a different hospital, by physicians and nurses not specialized in BMT. Purpose To identify what information is given to the patient from diagnosis until being admitted to the transplant unit. What information is needed from patient, doctors and nurses' perspective and how it should be given?

Methods, Intervention, & Analysis: Method To prepare the participants for an interview, we created a semi structured questionnaire and emailed it to eight doctors and nurses at five referring hematology units in Denmark. All agreed to participate. Seven interviews were carried out over the phone and one in person. Questionnaires were handed out to eight patients who received their transplant during September and October 2012. All agreed to participate. Patients were interviewed in person at the hospital. Two focus group interviews were conducted among nurses in the in- and outpatient BMT-clinic.

Findings & Interpretation: Results from interviews All participants stated that they would like more information about time range from diagnosis to the time of transplant. Neither staff from referring hematology units nor patients had the full view of time from HLA typing is performed to the time of transplant. The patients stated that lack of time frame made them and their family frustrated since there are economic, work related, and social arrangements to take care of before transplant. Their idea was that information could be carried out as a small pamphlet. All patients and staff from referring units asked for more visual information; video with patients going through transplant and pictures of the transplant unit. Some asked for a list with links to national and international web pages about BMT and a list with frequently asked question (FAQ). Patients suggested that staff from the transplant unit should go to referring hematology units to teach staff. Contact to the Danish Cancer Society has been established and a video production has started. Video will be ready in early 2014 and will be posted on the Danish Cancer Society's web site and a link will be present on the hospital web page. A time line with information about the deferent processes has been created and is posted on the hospital web page together with links to books about transplant, which can be downloaded. Links to relevant national and international web pages has been posted. List with FAQ has been developed and posted on the web page.

Discussion & Implications: Perspectives To introduce the new part of the hospital website to doctors and nurses at referring hematology units. To post the website so current and future patients will get to know it. To post pictures of the BMT unit on the hospital website. Future project is to arrange visit/meetings with referring hematology units, teaching staff.

Evidence Based Practice: Cryotherapy for Patients Receiving High Dose Melphalan

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Topic Significance & Study Purpose/Background/Rationale: Oral mucositis (OM) results in significant morbidity and mortality in hematopoietic stem cell transplant (HSCT) patients. HSCT nurses impact OM outcomes. Goals of this evidence based practice (EBP) project are (1) review concepts of EBP, and (2) apply EBP to the clinical problem of OM in HSCT. A PICOT question was formulated: In HSCT patients receiving high dose melphalan, does using oral cryotherapy versus not using cryotherapy decrease the amount of mucositis patients experience through day plus thirty? Three data bases were searched and ten studies were retained for critical review. The evidence supports the use of cryotherapy in HSCT. A nurse practitioner and two nurse champions led the team of nurses and other professionals to collaboratively implement the practice change.

Methods, Intervention, & Analysis: An educational session reviewing EBP, the problem and assessment of OM, the evidence, and the cryotherapy protocol, was attended by 100% of the clinical staff and support staff. Patients are given an explanation of the potential benefits of oral cryotherapy and can accept or refuse the intervention. The World Health Organization (WHO) mucositis scale is used to evaluate OM. Outcome measures include grade and duration of OM, need for hospitalization for OM, and use of TPN. Practice change is measured by how many patients are offered cryotherapy and frequency of OM grading. Data is obtained by a nurse and reviewed independently by a second nurse.

Findings & Interpretation: This pilot included the first 16 patients who received melphalan. All of the patients were offered cryotherapy and 100% of patients accepted cryotherapy. The highest grade of OM was 3. Four patients had no OM. No patients were hospitalized for mucositis and no patients received TPN secondary to OM.

Discussion & Implications: Findings demonstrate practice change occurs when nurses know the evidence. Additionally, when patients are presented with self care options for symptom prevention they are willing participants. The findings are consistent with evidence in the literature: cryotherapy reduces the incidence and severity of mucositis in this setting. Further study is needed to determine how long patients need to implement cryotherapy to get maximal results and to determine best practice to prevent mucositis outside the oral cavity.

Implementation of a Standardized Cardiac Monitor Care Process to Reduce Nuisance Alarms

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Topic Significance & Study Purpose/Background/Rationale: Excessive alarms create desensitization and alarm fatigue. Recently, the Joint Commission declared a sentinel event alert regarding improper alarm monitoring. Nurses play a key role in daily management of cardiac monitor care. We created and implemented a standardized cardiac monitor care process (CMCP) on a large bone marrow transplant (BMT) unit using the Improvement Methodology. The global aim of this project was to improve patient safety, satisfaction, and utilization of resources through decreasing monitor alarms by standardizing care.

Methods, Intervention, & Analysis: Through small tests of change, we developed and implemented a standardized CMCP in a 24-bed BMT unit. The CMCP included: 1) process of initial ordering and setting of monitor based on age appropriate standards; 2) pain free daily replacement of electrodes; 3) daily individualized assessment of cardiac monitor settings; 4) reliable process for appropriate discontinuation of monitor. The model for improvement was used to design, test, and implement changes. The key drivers and interventions can be seen in Figure 1. Changes that were implemented after testing and adaptation: family/patient engagement in CMCP, creation of a monitor care log to address settings, lead changes, and discontinuation; development of a pain free process for electrode removal; increase in high respiratory rate settings. Compliance with the CMCP was measured as percent compliance with the overall process. Alarms were measured in cardiac monitor alarms per monitored patient day.

Findings & Interpretation: From January-September 2013, percent compliance with the CMCP increased from 30% to >90% compliance (median=93%) Figure 2. Number of alarms per patient day decreased from 180 to 25 (median=32) alarms/day during this time period Figure 3.

Discussion & Implications: Implementation of the standardized CMCP results in a significant decrease in cardiac monitor alarms per patient day.

Improving Efficiency of BMT LTFU Clinic, Resulting in Increased Patient Satisfaction

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Topic Significance & Study Purpose/Background/Rationale: Clinic staff of the multidisciplinary bone marrow transplant (BMT) long term follow up (LTFU) clinic evaluated current process and flow and identified several areas of improvement. Wait times for patients were long with extended periods of time between providers. In addition, scheduling tests, procedures and consults was difficult due to lack of organization. After comprehensive evaluation the clinic staff devised a plan to improve patient satisfaction, flow and decrease wait times.

Methods, Intervention, & Analysis: Several modifications to the current system were implemented in an effort to improve efficiency, Figure 1. An identification system was implemented outside each room to decrease interruptions of provider visits. The patient's schedule was displayed in the room for visibility by staff and family. A schedule of patients and scheduled appointments was made available in the clinic office. A strict schedule of provider times was employed and presented in Figure 2. Ongoing monthly meetings were held with the multidisciplinary team to determine optimal clinic scheduling, revise evaluation guidelines and review each patient case. Clinic staff was responsible for clinic flow, patient information and patient follow up after visits. A letter was sent to families scheduled for annual visit one month prior to the appointment. This letter outlined expectations (i.e. labs pre-drawn, no walk-ins) to improve adherence to the new structure.

Findings & Interpretation: At 2 months the clinic staff evaluated effectiveness of changes to clinic. A significant improvement was noted in patient wait times, see Figure 3. However, within six months adherence by some providers declined. The majority of labs are completed prior to the clinic day. Walk-ins dramatically decreased. Monthly meetings help to bring closure to the past month and prepare for the next, thus guaranteeing everyone's expectations are consistent.

Discussion & Implications: The implemented changes significantly improved the multidisciplinary BMT LTFU clinic. Future directions are aimed at evaluating patient satisfaction and increasing adherence to provider schedule.

Implementation of a Robust Intervention to Address Central Line Associated Blood Stream Infection Rates in an Acute Oncology and Stem Cell Patient Population in an Academic Setting

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Topic Significance & Study Purpose/Background/Rationale: Oncology patients require vigilance to prevent life-threatening infections. The oncology nursing role to reduce central line-associated blood stream infections (CLABSI) is documented widely (Whited, A. & Lowe, J. ,2013). An opportunity to improve quality and safety was identified in an acute hematology/oncology population in an academic setting. Implementing evidence to reduce CLABSI's as infection rates rose, became priority to reduce morbidity and mortality. A systems gap assessment was recommended, performed and analyzed. An educational intervention was proposed, implemented and evaluated. Reduction in CLABSI rates was demonstrated by implementing CL insertion and maintenance "bundle" approach (Centers for Disease Control and Prevention, 2011). Initial research occurred in critical care settings but specific attention to oncology and immunocompromised patient population is required (Fraser, T. & Gordon, 2001).

Methods, Intervention, & Analysis: Nurses in the Adult Hematology/Oncology (AHO), a 29 bed unit, and Adult Stem Cell Transplantation (ASCT), an eight bed unit, implemented an intervention to reduce CLABSI rates. Four steps included: 1) education; 2) standardized approach to central venous catheter (CVC) maintenance; 3) practice audits three times per week on all patients and 4) immediate peer feedback. Prior to implementation, CLABSI rates were 4.85 (AHO) and 3.21 (ASCT) times the National Healthcare Safety Network (NHSN) Mean. Post intervention, rates decreased to 1.15 times NHSN Mean within one quarter. Both units reached over 185 preventable CLABSI free days. Nurses completed CVC education and collaborated with the medical team to address appropriateness of CVCs. CLABSI nursing champions were identified to support education and interdisciplinary collaboration.

Findings & Interpretation: Knowledge deficit regarding existing policy was identified. Educational sessions addressed this gap. The CLABSI rate for AHO in October-December 2012 measured 6.79 (NHSN Mean 1.40) and measured 7.71 for ASCT (NHSN Mean 2.40). In April - June the AHO rate measured 1.62 and measured 0 for ASCT. Findings post-intervention included: 1) reduced practice confusion; 2) increased compliance of 98% with best practices; 3) no breaks in sterility; and 4) increased policy knowledge.

Discussion & Implications: Findings are consistent with recommendations for reducing CLABSI in non-ICU setting. Pre and post data indicate education and process standardization reduced CLABSI incidence and addressed a quality and safety gap for health systems.

Building Capacity for the Future of Hematopoetic Cell Transplant Nursing

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Topic Significance & Study Purpose/Background/Rationale: Significance/Background March 1969 Dr. Don Thomas and his team carried out the first Hematopoetic Cell Transplant (HCT). Dr Thomas attributed the success of HCT to the expert team of nurses and physicians. Now 45 years later a need exists to increase the capacity of centers to meet the growing demand for HCTs. The National Marrow Donor Program® sponsored the System Capacity Initiative to analyze and suggest interventions on how to care for a 2-3 fold increase in HCT patients by 2020. In light of health care delivery shifting to the outpatient department (OPD), a HCT nursing leadership team proposed a pilot transition from academia to practice model with a local university.

Methods, Intervention, & Analysis: Interventions In January 2012 the pilot began and a total of 24 students have rotated through the OPD with a precepted model of learning. HCT experts have taught conferences on death and dying, biology of cancer, immunology, line management and history of HCT

Objectives 1. Establish a clinical oncology rotation for BSN students. 2. Create a residency program with nurses completing the HCT clinical oncology rotation. 3. Increase the applicant pool for future HCT staffing

Findings & Interpretation: Findings From the initial 18 months of the pilot both the University and the HCT center have met objectives for the program. Students rank the HCT clinical experience as valuable for knowledge and skill acquisition. The HCT center has hired 5 nurses for residency, 2 have accepted full time HCT positions.

Discussion & Implications: Implications Today's HCT's centers are challenged to find innovative ways to expand recruitment and increase applicant pools for HCT nursing. The tradition of nurses working inpatient first as mandatory no longer is appropriate as most care of patients has moved to the OPD setting. Further long term analysis is needed to determine success of this transition to practice model.

The Lived Experience of an Autologous Hematopoietic Stem Cell Transplantation: a Qualitative Study

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Topic Significance & Study Purpose/Background/Rationale: The U.S. Department of Health and Human Services estimates that 18,900 hematopoietic stem cell transplants (HSCTs) were performed in 2011. Autologous transplants are the most common type of HSCT worldwide. The use of autologous HSCT has increased because of its effectiveness in treating certain hematologic malignancies specifically lymphomas and multiple myeloma. Despite the fact that autologous transplants have surpassed the number of allogeneic transplants, the studies that focus exclusively on the lived experience of autologous transplantation patients are limited. The purpose of this study was to understand the lived experience of patients undergoing an autologous HSCT.

Methods, Intervention, & Analysis: This was a qualitative phenomenological study. Four patients in an outpatient bone marrow transplant clinic were invited to participate in an interview to reflect on their experiences as an autologous HSCT recipient. The participants were targeted six to twelve months post transplant to allow time for reflection and attribution of meaning of this experience in their own lives. The use of the open-ended question, "Please describe your experience as an autologous HSCT recipient" allowed participants to expand on issues of importance to them. The interviews were audiotaped and transcribed by the nurse researchers. They were analyzed using hermeneutic phenomenology as described by van Manen (1997) in order to more fully understand their experiences.

Findings & Interpretation: Analysis of the four interviews revealed a number of themes. The six major themes that emerged are: (1) worry and fear; (2) trusting and relationship building with caregivers; (3) isolation and contemplation; (4) significant life changes; (5) new identity based on self-reflection; and (6) challenges and coping.

Discussion & Implications: The objective of this study was to explore the phenomenon of experiencing an autologous HSCT and gain insight for nursing practice. The interviews revealed that while each participant has a unique experience with autologous HSCT, elements of the experiences are shared. The themes will help inform the understanding of and nursing care provided for this population in the future.

Amyloid Treatment Pearls: Standardizing an Approach to Patient Care

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Topic Significance & Study Purpose/Background/Rationale: Background: There are approximately 3000 new cases of Amyloidosis diagnosed each year. While this is a relatively uncommon disease, an increasing number of cancer centers are transplanting patients for disease control. The unique clinical features of Amyloid coupled with the complications from therapy require knowledgeable staff to assess and manage these complicated patients. As an experienced Amyloid treatment center, we have established standardized treatment guidelines specific to this patient population. These guidelines offer health care providers at the bedside the basic tools to provide the best care possible to improve patient outcomes for patients undergoing high-dose chemotherapy and autologous stem cell transplant for Amyloid.

Methods, Intervention, & Analysis: Intervention: A standardized approach for management of patients with Amyloid undergoing high-dose chemotherapy and autologous stem cell transplant (ASCT) was implemented based upon our clinical experience with this disease as an established Amyloid treatment center. Defined patient care interventions within this approach are directed toward minimizing transplant-related morbidity, particularly in patients with cardiac or autonomic nervous system involvement of Amyloid.

Findings & Interpretation: Findings: By incorporating standardized interventions in the Amyloid patient population undergoing ASCT, we have been able to minimize peri-transplant complications through maintenance of strict euvolemia, preventive cardiology practices, and promotion of patient conditioning.

Discussion & Implications: Discussion & Implications: Transplant-associated morbidity in the Amyloid patient population is often correlated with disease-related organ damage. Our guidelines were designed and implemented based upon our experience treating this disease and are focused on preventive strategies and supportive measures. These interventions minimize transplant-related complications in this unique patient population and provide practical guidance for day-to-day management.

Bridging the Exercise Gap in BMT Survivors

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Topic Significance & Study Purpose/Background/Rationale: In an effort to address long term health risks in patients who have undergone allogeneic BMT, a collaborative team at UC San Diego started a BMT Survivorship Clinic that is spearheaded by one of our nurses. The clinic focuses on risk assessment, screening and prevention with the goal to improve quality of life and survival with a low morbidity post BMT. As part of the visits, patients complete a questionnaire. We analyzed the data and identified exercise as a need among our survivors. In reviewing the research, exercise has been shown to reduce fatigue and improve physical functioning among transplant patients. We wanted to determine if this was true among our patient population and then formulate a feasible intervention for those patients in need.

Methods, Intervention, & Analysis: Of the 32 patients who completed the questionnaire, we found that 44% are not exercising. Of the non-exercisers, 64% reported fatigue compared to 22% of exercisers. 86% of the non-exercisers reported joint stiffness compared to 22% of exercisers. Finally, 43% of non-exercisers reported difficulty with performing ADLs compared to 6% from the exercise group.

In accordance with the research, our findings demonstrate that those who lack physical exercise may also suffer more from fatigue, joint stiffness, and difficulty performing ADLs.

Findings & Interpretation: In response, we developed a "Prescription for Exercise." This "prescription" is a 1-page information tool that introduces BMT patients to safe exercise pre- and post transplant. It gives concrete guidelines for strength training and cardiovascular exercises. Since the nurses play an integral role as educators throughout the transplant process, we asked them to take an active role in making this intervention a success. We identified specific times for this educational intervention to take place during the transplant process beginning at the initial consult

Discussion & Implications: Our goal is for patients to take an active role and know that exercise is safe to perform during transplant with certain restrictions and precautions. We want patients to become more physically active and receive the benefits of an improved quality of life.

Continued studies regarding exercise in BMT patients is needed to warrant the patients' need for exercise throughout the transplant process. We hope we can add to this evidence by conducting our own institutional research study using these interventions as stepping stones for future studies.

Increase in Utilization of Hematopoietic Cell Transplantation for Sickle Cell Disease: implications for nurses

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Topic Significance & Study Purpose/Background/Rationale: Sickle cell disease (SCD) is the most common inherited disorder in African-Americans. In the US, approximately 100,000 people live with SCD.¹ SCD is an inherited hemoglobin disorder where sickle-shaped red blood cells block blood vessels; thus, causing excruciating episodes of pain and progressive and permanent damage to vital organs. While the lives of patients with SCD have been greatly improved through advances in medical care, the only available curative therapy remains hematopoietic cell transplantation (HCT). Barriers to HCT exist and include distrust of medical professionals, need for specialized information and education about transplant and the risk of mortality.² However, research suggests that there is strong interest in HCT and a willingness by patients to accept a small but definite risk of mortality.³ This is evidenced by the growing number of HCT for SCD over the last decade. Although there is no consensus among experts on the number of SCD HCT candidates, a conservative estimate suggests there are nearly 10,000 eligible patients. We seek to highlight the changing demographics of HCT patients, improved event-free survival and discuss implications for nurses.

Methods, Intervention, & Analysis: We conducted a literature review to identify survival outcomes for patients with SCD undergoing HCT. A search of PubMed for English-language articles from the US published from 1990-2013 included the following terms: sickle cell disease and transplantation, and event free survival and transplantation. After screening 420 articles, seven provided relevant information.

Findings & Interpretation: HCT, a treatment historically used for hematologic malignancies is now becoming an acceptable treatment for non-malignant disorders such as SCD, which disproportionately affects African Americans. The event-free survival rate for patients undergoing HCT for SCD has increased steadily from 73% to 92% over the past 12 years.^{4,5}

Discussion & Implications: As the demographics of HCT change and outcomes improve, HCT nurses will be at the forefront caring for and educating a historically underserved population. HCT nursing practice must reflect knowledge of the impact of socio-cultural factors on patients' health values, beliefs, behaviors and clinical decision-making. The nursing role as educator will take on great importance as effectively providing relevant patient education will help to mediate barriers to care and mistrust. The number of patients with SCD undergoing HCT is expected to increase in the upcoming years. This shift will require HCT nurses to broaden and refine their patient education and cultural competency skills.

a Pre, Intra, Post-Transplant Trajectory Approach to Discharge Teaching--Nurse Coordinator Discharge Teaching Competency: Pre-Hematopoietic Cell Transplant Admission.

Gerry Gorospe, Liz Cooke, Shirley Johnson, Anne Bourque, Brenda Thomson. City of Hope, Duarte, California

Topic Significance & Study Purpose/Background/Rationale: Hematopoietic transplantation (HCT) is complex and nursing staff is faced with preparing the patient/family for discharge. Patient/family education is associated with better outcomes and decrease in hospital stay. The HCT nurse coordinator (NC) is the first nurse who has an opportunity to discuss discharge teaching as a part of the transplant work-up preadmission. A project was developed at City of Hope to formulate competencies for nursing staff to meet the patient/family education need, improve the HCT NC staff teaching proficiency, and meet transplant regulations. This will discuss 1) Trajectory of Patient Education—Pre-transplant; 2) identify specific content areas for pre-transplant teaching; 3) the implementation of discharge teaching competency for NC.

Methods, Intervention, & Analysis: Phase 1 consisted of a self- assessment and content formulation with an ad-hoc committee of various nurses, and a clinical social worker. Objectives were to 1) create content and develop methods for patient/caregiver education in HCT; and 2) improve nursing competencies in educating patient about HEM/HCT patient population. Phase 2 consisted of staff training through electronic series of articles with post-tests and continuing education units; completion of the ONS Fundamentals of Hematopoietic Transplant Online Course and three didactic sessions. Phase 3 consisted of pilot implementation of various methods of patient education: initial nurse coordinator consultation with one on one teaching, and formal classroom didactic.

Findings & Interpretation: The results from the NC self-assessment survey (N=16): Novice 12%, Advance Beginner 9%, Competent 38%, Proficient 39%, Expert 2%. Year-to-date, "Preparing for HCT" class attendance is 69%, target is 70%. Patient feedback from this class (Likert scale) is 4.61. This is improvement in hospital LOS < 21 days for our population of Autologous HCT from 39% to 71%.

Discussion & Implications: The concept of Pre, intra, and post trajectory of patient/family education created focused patient education. The created content provided a template for competent teaching for the HCT patient population.

Nursing Workflow is Critical to the Design of a New Pediatric Bone Marrow Transplant Unit

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Topic Significance & Study Purpose/Background/Rationale: The Children's Hospital Los Angeles Hospital offers advanced treatment for pediatric patients undergoing Bone Marrow Transplantation (BMT). A new BMT unit was designed as a specialized closed unit culminating an open living space in a state of the art family-centered care environment for patients who are severely immunocompromised. The unit maintains fourteen single patient rooms with vertical anterooms between rooms for routine patient access. There is a family rest/storage area, six nurses' stations, medication, utility and supply/equipment rooms and other support areas on the unit. There is one central monitoring station near unit entry. Nurses' stations were designed adjacent to the patient rooms, minimizing walking distances for nursing and maximizing views of all patient rooms. Within one year post move in, patient volumes and acuity steadily increased and an array of nursing workflow challenges presented themselves. These issues were related to delivery and administration of medications inclusive of new intravenous (IV) volumetric pumps, geographical distance causing alteration in communication, nursing physical ailments and a decrease in patient family survey responses to nurses' responding to patient needs/requests

Methods, Intervention, & Analysis: In attempt to mitigate these challenges, senior BMT and intensive care staff identified key indicators for workflow assessments. Six twelve hour shift observational workflow studies were completed by BMT and non BMT staff for day and night shifts equally. This presentation will detail the study results.

Findings & Interpretation: Results provided justification to increase patient hours of care, increase nurse FTEs, install automatic patient room door openers, purchase beds/cribs with built in scales, install additional central monitors, replace patient room blinds for improved visualization, revise IV supplies and medication administration procedures and plan for a pharmacy concierge service.

Discussion & Implications: It is imperative that nursing is frontline in the initial and ongoing stages of planning and design for new specialized environmental patient care units.

Infection prevention in BMT patient's utilizing chlorhexidine bathing

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Topic Significance & Study Purpose/Background/Rationale: The blood and marrow transplant (BMT) patients are at high risk for central line associated blood stream infections (Clabsi) as well as clostridium difficile (c-diff) related to their treatments and immunosuppressive states. A literature search was completed related to the possible use of chlorhexidine (CHG) to bathe the patients; the manufacturer guidelines were also referenced on the optimal way to institute the bathing. The prediction was that by instituting CHG daily bathing the rates of Clabsi and c-diff may be impacted and decrease.

Methods, Intervention, & Analysis: Education was initiated in June for the registered nurses (RN) and the patient care assistants (PCA), utilizing posters, daily reminders, and weekly newsletter reminders. Patient education was also initiated, in the form of a leaflet with the procedure of showering with CHG; this was provided to patients on admission. The launch of CHG showering was July 1st (the beginning of the 3rd quarter reporting). Follow up education was completed with the RN's and the PCA's in October. The PCA's received a more extensive breakdown of the benefits of CHG bathing in relation to methicillin resistant staphylococcus aureus, vancomycin resistant enterococcus and clostridium difficile.

Findings & Interpretation: Two months after the implementation of the CHG showering an audit was completed to gauge the percentage of patients that where bathed with CHG, the BMT patients were bathed 82% of the time with CHG. The 3rd quarter clabsi and c diff initial results, although not yet confirmed, are favorable in regards to reduced rates of clabsi and c-diff.

Discussion & Implications: The CHG showering/bathing is an added advantage to the interventions used to try and reduce Clabsi and c-diff infections, we will continue with the CHG showering and bathing as well as monitor the results

Safety and Efficiency of Administering Foscarnet in an Intensive Adult Bone Marrow Transplant Clinic: A Multidisciplinary Approach

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Topic Significance & Study Purpose/Background/Rationale: Allogeneic hematopoietic stem cell transplant (HSCT) patients frequently reactivate cytomegalovirus (CMV) and human herpes virus type 6 (HHV-6). Administration of the antiviral foscarnet is efficacious therapy in many patients. Foscarnet administration, however, is complex given the need for dose modifications based on renal function and the considerable risk of nephrotoxicity and serious electrolyte abnormalities. This requirement, along with increases in patient volume, mandates an efficient standard operating procedure (SOP) to facilitate safe foscarnet administration in the outpatient setting. The purpose of this multidisciplinary study was to compare three SOPs for foscarnet administration for efficiency (patient clinic time and amount of calcium repletion) and toxicity (electrolyte, renal and neurologic).

Methods, Intervention, & Analysis: In this IRB approved study, data were collected on HSCT patients to evaluate 3 SOPs for foscarnet administration: SOP1 (Apr-June 2012), SOP2 (Jun-Sept 2012) and SOP3 (Jan-May 2013) (Figure 1). Foscarnet was administered with high volume hydration. Data analyzed included foscarnet dose (mg/kg), ionized calcium (iCa) and magnesium (Mg) levels, creatinine clearance (CrCl), dose of intravenous calcium repletion, neurological symptoms of hypocalcemia and length of clinic visits. Continuous outcomes were summarized using means and standard deviations. Differences between SOPs were tested using a GEE linear model that accounted for patient-level correlation.

Findings & Interpretation: There were 52, 33 and 85 foscarnet visits which corresponded to 4, 4 and 8 patients for SOPs 1, 2 and 3, respectively. Patients were treated for CMV or HHV6 viremia. No patient had symptomatic hypocalcemia. SOPs were comparable with respect to Mg level and nephrotoxicity, but SOP 3 had a significantly higher mean pre-foscarnet iCa level of 5.1 mg/dL than SOP1 (4.8 mg/dL) ($p = 0.02$). SOP2 was associated with a higher mean calcium repletion/visit of 6 gm than SOPs 1 (4 gm) or 3 (4 gm) ($p = 0.05$). Finally, the shortest mean patient clinic time was with SOP3 (271 minutes) compared with SOPs 1 (396 minutes) or 2 (388 minutes) ($p = 0.03$, Figure 2).

Discussion & Implications: This analysis shows that substitution of a post-foscarnet iCa measurement with empiric post-foscarnet calcium repletion (SOP3) is more efficient by decreasing total amount of calcium repletion and patient clinic time without compromising safety.

Effective Use of Tocilizumab, an Anti-Interleukin 6 Agent for the Treatment of Steroid-Refractory Grade IV Intestinal Acute Graft-Versus-Host Disease in a Child with Sickle Cell Disease.

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Topic Significance & Study Purpose/Background/Rationale: The success of allogeneic hematopoietic cell transplantation (AlloHCT) continues to be limited by the incidence of acute graft-versus-host disease (aGVHD), a serious and sometimes fatal complication. Steroid-refractory aGVHD (SR-aGVHD) that is unresponsive to initial therapy with glucocorticosteroids has a 40% response rate to second line agents. Interleukin-6 has been implicated in the pathogenesis of aGVHD. Tocilizumab (TCZ) is an anti IL-6 monoclonal antibody and, to our knowledge, has not been previously reported for the treatment of aGVHD in children.

Methods, Intervention, & Analysis: We present a 3 year-old boy with a history of sickle cell disease who received a 7/8 matched unrelated donor AlloHCT. On day + 35, he was diagnosed with Grade IV intestinal aGVHD by both pathologic and clinical criteria. Symptoms included an ileus, stool output >1 liter/m²/day, persistent abdominal pain, and hematochezia. His abdominal pain was not controlled by escalating doses of either hydromorphone or fentanyl. Moderate relief was demonstrated with the combination of a ketamine drip and methadone. Initially the patient received methylprednisolone (2mg/kg/day), but was determined to be SR-aGVHD with worsening symptoms. He subsequently received multiple anti-GVHD agents at different time points, including mesenchymal stem cells, etanercept, basiliximab in combination with infliximab, pentostatin, and anti-thymocyte globulin. Despite these efforts, the patient exhibited no change in either symptomatology or histology. Approximately 2 months after the initial diagnosis of aGVHD, interleukin-6 levels were demonstrated to be 100 times the upper limit of normal. Salvage therapy with TCZ was initiated at a dose of 8mg/kg weekly for three weeks and then every other week for three subsequent doses. Within three weeks of the initiation of TCZ therapy, the patient showed an improvement in stool output and abdominal pain, subsequently narcotic were weaned off successfully. Eight weeks after discontinuation of TCZ, the patient developed a recurrence of abdominal pain and an intestinal biopsy was positive for grade I aGVHD. TCZ therapy was reinitiated on an every other week basis for four doses and a complete remission of aGVHD was achieved. At the time of writing this report, the patient no longer exhibits signs or symptoms of aGVHD and is in the process of being discharged after a 9-month hospitalization.

Findings & Interpretation: In the literature to date, there is just one case report of the use of TCZ in an adult with SR-aGVHD. An appropriate dose and schedule has not been established. Due to the severity of this child's disease and demonstrated lack of response to conventional therapies, we utilized TCZ as a salvage therapy and found it to be well tolerated and potentially life saving.

Discussion & Implications: Though our findings consist of this single patient, the dramatic improvement noted may demonstrate potential efficacy of TCZ in children with SR-aGVHD.

Sub-Therapeutic Blood Tacrolimus Levels after Conversion from Continuous Intravenous (IV) Infusion to Per Oral (PO) are Associated with Higher Incidence of Acute Graft Versus Host Disease (AGVHD) in Children Following Allogeneic Hematopoietic Cell Transplant (AlloHCT)

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Topic Significance & Study Purpose/Background/Rationale: Limited data exists to determine the most appropriate conversion factor from IV to PO administration of tacrolimus in children receiving tacrolimus for aGVHD prophylaxis following AlloHCT. The incidence and impact of sub-therapeutic tacrolimus levels after conversion from IV to PO is also not well described.

Methods, Intervention, & Analysis: We retrospectively studied the association between length of time to achieve therapeutic tacrolimus levels (defined as >10ng/ml x 2 days) after conversion from IV to PO using the currently accepted factor of 4:1, as well as the incidence of grades I-IV aGVHD. aGVHD prophylaxis consisted of mycophenolate mofetil and tacrolimus. Tacrolimus was initiated at a dose of 0.03 mg/kg/day as a continuous IV infusion. The dose was adjusted to maintain trough levels within the range of 10-20 ng/mL. Once patients were able to tolerate oral medications they were transitioned to PO tacrolimus. Patients were kept in the hospital until they achieved therapeutic tacrolimus levels on PO. Patients were excluded if tacrolimus was initiated as IV and was never transitioned to PO or if they were started on PO and remained on PO for the duration of therapy.

Findings & Interpretation: Eighty-nine children (mean age, 8.3 yrs; range, 0.25-22: 60M/29F) undergoing AlloHCT for malignant (n= 52, 58.4%) and nonmalignant (n=37, 41.6%) disorders between March 2005 and April 2012 were identified. The overall incidence of Grade I-IV aGVHD was 48.3%. At the time of diagnosis of aGVHD, 20 patients (46.5%) were on IV tacrolimus, and 23 patients (53.5%) were on PO tacrolimus. Patients were transitioned to oral tacrolimus at a median of 23 days post-AlloHCT. After conversion to PO tacrolimus, the median and mean number of days to reach a therapeutic level was 7 and 10.2d (range 0-61), respectively. We compared the mean number of days to achieve therapeutic levels between those patients who developed aGVHD (n=43, 12.6 days) and those who with no aGVHD (n=46, 8.1 days), demonstrating that patients diagnosed with aGVHD took on average 4 days longer to achieve therapeutic levels on oral tacrolimus, which was statistically significant p=0.026 (t-test). Patients \geq 12 yrs (n=31) when compared to patients <12 yrs (n=58) took a significantly longer time to achieve therapeutic levels (12.8 vs. 8.8 days t-test, p=0.05) after conversion from IV tacrolimus to PO. There was no significant association found between prior diagnosis of aGVHD and number of days required to obtain therapeutic tacrolimus levels.

Discussion & Implications: In conclusion, this data suggests that the longer a patient takes to achieve therapeutic tacrolimus levels after transitioning to PO, the greater their risk for developing aGVHD. Further analysis is ongoing to identify specific risk factors and patient populations who take longer than the median number of days to achieve therapeutic tacrolimus levels. This analysis may identify patients who may benefit from a modified conversion factor when transitioning from IV to PO tacrolimus.

Delirium Management: A Bone Marrow Transplant Veteran Case Study

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Topic Significance & Study Purpose/Background/Rationale: Since September 11, 2001, over 2.4 million service members have been deployed to Iraq/Afghanistan war. Stressors in combat include situations where soldiers can be seriously injured or killed (75-85%), knowing someone seriously injured or killed (65-80%), and events causing intense fear, helplessness or horror (35-50%). In combat, 79% of soldiers report shooting at the enemy, 62% report explosions near them, and 48% report responsibility for someone's death. There are three Veterans Administration (VA) bone marrow transplant (BMT) centers in the United States; however, many service members choose transplant centers outside the VA system.

Methods, Intervention, & Analysis: Case Description: A 39 year old male was diagnosed with Amyloidosis. After partial remission from Velcade and Revlimid, the patient was admitted for an Autologous BMT. He was pleasant and cooperative initially; however, he never slept. A few days after transplant, it was noted mid-day that he was disoriented with paranoid behavior. He paced his room talking loudly. The same evening he threatened staff, broke his IV tubing, and claimed a bomb was in his room. His wife was unable to calm him and he began swinging items at the nursing staff. The hospital police helped restrain the patient long enough to remove dangerous objects from the room and secure his Central IV Access. Haldol was given to calm him. The staff identified his delirium "trigger" as coming from insomnia related to a hyper-excitabile state. His plan of care was to approach him cautiously to avoid startling, provide uninterrupted rest time on both shifts, and manage his care in a structured, organized fashion. The patient's delirium resolved, and he leads a productive civilian life post transplant.

Findings & Interpretation: The major findings in our case study conclude that better understanding of PTSD in future veteran BMT patients is needed in order to provide holistic care. Current literature on PTSD when paired with a cancer diagnosis and treatment with a stem cell transplant is limited.

Discussion & Implications: While the VA offers national educational training for veteran care, only about 31% of community providers are VA trained. Post Traumatic Stress Disorder (PTSD) is under-reported; therefore, also under-diagnosed. Specific requirements are needed to make the diagnosis. BMT staff need additional training to better care for the combat veterans who are at risk for PTSD delirium episodes.

Caring for the Caregiver: A Nurse Practitioner-led Psycho-Educational Support Program

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Topic Significance & Study Purpose/Background/Rationale: The challenges, burdens and stressors that cancer caregivers face have been well documented in the literature. Research has repeatedly found that cancer caregivers often neglect their own health, have informational and emotional needs that are unmet by the health care team, and report higher levels of anxiety and stress than the patients while undergoing treatment. Specific nursing interventions that ease the caregiver experience are not as well documented. The purpose of this program was to assess the feasibility and interest in a Nurse Practitioner-led intervention to ease caregiver distress and burden.

Methods, Intervention, & Analysis: On a 58 bed inpatient oncology unit, a monthly Nurse Practitioner-led psycho-educational support program was designed to ease caregiver distress and burden. Each session lasted 1 hour. The first thirty minutes provided participants an opportunity to share their experiences while being supported by the practitioner and each other. The second half of each session was devoted to the content of a self-care topic. Topics presented included: maintaining healthy lifestyle, sleep hygiene and stress management. A physician question and answer session was also offered. The physician session allowed caregivers the opportunity to "pepper" an attending physician with specific questions, and more importantly an opportunity to be "heard" by the medical team. These content topics were chosen based on the caregiver needs identified in the literature.

Findings & Interpretation: Informal evaluation of the program indicated that all thirty-three caregivers who attended the sessions found these sessions "very helpful". Comments reflected a desire for more sessions, offered more frequently. These responses validate the need for a caregiver support program and indicate the caregivers' willingness to participate in provided interventions.

Discussion & Implications: Oncology nurse practitioners can alleviate caregiver distress and burden by developing interventions that directly address psychological and educational needs of caregivers. The cancer caregiver population would benefit from a more in depth evaluation of such interventions.

Simulation: Onboarding Competence with Confidence

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Topic Significance & Study Purpose/Background/Rationale: Simulation training provides new nurses exposure to patient situations they will encounter in BMT nursing. Newly graduated nurses were found to perceive that simulation scenarios facilitated learning (Kaddoura, 2010). According to the Institute of Medicine's (IOM) Future of Nursing Report, the interprofessional team must collaborate to ensure that nurses engage in learning to achieve competency (Robert Wood Johnson Foundation, 2010). High priority competencies in the BMT arena include sepsis recognition, assessment and interventions, and compassionate end of life care (FACT- JACIE International Standards, 2012). Septic shock is one of the most frequent oncologic emergencies. The BMT nurse's early recognition of sepsis is an essential competency that can improve patient outcomes (Samphao, Eremin, & Eremin, 2010). Nurse educators are central to the task of providing competency training on these topics.

Methods, Intervention, & Analysis: This study is based on a convenience sample of new and experienced nurses and new graduate nurses from September 2012 through current date. As a part of the Internship, each new graduate nurse is required to complete two additional scenarios for sepsis and end of life. Of the total 195 nurse orientees, 90 were graduate nurses and 105 were experienced registered nurses. A qualitative study of a participant evaluation was completed. A diagram of the Simulation Process can be found in Figure 1.

Findings & Interpretation: The participant studies demonstrated a 87% favorability in promoting the individual's learning with the orientation curriculum and 91% favorability of confidence with the development of skills and required knowledge managing the deteriorating patient, sepsis assessment and interventions and end of life event. Figure 2.

Discussion & Implications: In the acute care setting, simulation innovation is a valuable tool in the process of onboarding nurses for the BMT practice setting. Future studies can include patient outcome data related to sepsis management. End of Life Simulation can prepare the new nurse to provide compassionate care interventions in a safe learning environment through debriefing. There can be an indication for simulation for ongoing competency for experienced nurses. The interprofessional team can benefit from simulation for complex management scenarios in the BMT population.

Red Bag Review: A Medication Reconciliation Initiative

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Topic Significance & Study Purpose/Background/Rationale: The American Medical Association (2013) defines medication reconciliation as a “team-based process that should be led by and is the responsibility of the patient’s attending or personal physician in collaboration with other health care professionals.” As an interactive process, the healthcare provider (HCP) engages the caregiver by reviewing and comparing the medication list with the medication containers. The pediatric stem-cell transplant (SCT) population is particularly vulnerable to medication errors due to the large number of medications per patient, the frequency of medication changes, and the multiple providers involved in care.

Methods, Intervention, & Analysis: During a gap-analysis meeting between Boston Children’s Hospital/Dana-Farber Cancer Institute (BCH/DFCI), the concept of a medication bag was generated with the hypothesis that providing a designated medication bag could improve the reconciliation process. With input from the multidisciplinary team, medication bags in two sizes were chosen to accommodate medication needs (Figure 1). An audit tool was created for pre-program and post-program assessment of the effectiveness of the intervention. Pre-intervention audit results of 50 SCT patients, 25 outpatient (DFCI) visits and 25 homecare (Home Health VNA) visits are discussed below.

Findings & Interpretation: The audited patients (n=50) had a variety of SCT diagnoses. The caregiver had the medication list present at only half of the visits, whether outpatient or homecare. Medications were brought by the caregiver to only 10/25 outpatient visits, of which the HCP compared medication packaging to the medication list in 8/25. (Figure 2). In 16/25 outpatient and 11/25 homecare visits at least one discrepancy was identified between the medication packaging and the medication list. The most common discrepancy was medication frequency (Figure 3).

Discussion & Implications: Currently, bags are being distributed to patients at discharge following SCT, and at outpatient visits. Education on medication reconciliation and pre-program audit results has been provided to nursing and physicians to improve process and practice. Post program audits will begin in October 2014 to evaluate program effectiveness. The next phase will allow us to evaluate whether the intervention of providing a designated medication bag can decrease the number of errors and improve medication reconciliation for the pediatric SCT population.

Moving a Bone Marrow Transplant Unit Towards a High Reliability Unit

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Topic Significance & Study Purpose/Background/Rationale: Bone Marrow Transplant (BMT) units consist of high acuity patients, complex processes, and high risk medications. Failure to insure safe, reliable processes can be detrimental to the BMT patient. The healthcare industry is investigating high reliability organizations (HRO) and modeling their practices and cultures of safety and reliability to form high reliability units (HRU). Key strategies propelling the HRO model forward include strong leadership, evidenced based practice (EBP), effective communication, trans-disciplinary teamwork, root cause analysis, a culture of safety and continuous learning, improved system designs and outcomes evaluation.

Methods, Intervention, & Analysis: To establish and promote reliability and decrease failure, a HRU task force was created on a 24 bed pediatric BMT unit. The task force guides quality improvement and EBP projects by incorporating the five principles of high reliability while standardizing the following processes: medication administration utilizing the no interruption zone (NIZ), chemotherapy administration, stem cell infusion, patient environment, RN shift handoff, and laboratory draws. Process improvement methodology assisted with standardization and evaluation through the Plan Do Study Act (PDSA) design. Unit champions participate in outlining the process, incorporating the practice onto the unit, and frequently monitoring to insure the process is followed.

Findings & Interpretation: Initially, an increase in awareness was observed during the development of standardized processes, creating a new baseline. Maintaining transformation of human behavior to follow a standardized approach has been proven challenging. Consistent auditing of practices followed by real time feedback is essential to conforming team members to the standardized process and measuring improvement.

Discussion & Implications: Intensive care units that participate in high risk processes where the cost for error can be detrimental to patient well-being are ideal environments to incorporate the HRO model. Continued monitoring and dissemination can assist other BMT units to establish safe and reliable health care environments for a complex and vulnerable patient population.

The synchronization of the nursing process with electronic clinical nursing documentation in Bone Marrow Transplant

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Topic Significance & Study Purpose/Background/Rationale: The Adult Bone Marrow Transplant unit of this NCI designated comprehensive cancer center successfully implemented a nursing electronic clinical documentation program that synchronizes the nursing process with electronic documentation to improve the delivery of care. The program is the continuation of an ongoing organizational effort to efficiently manage data and information in our complex healthcare environment. The goals of the electronic documentation program are to utilize technology to increase the efficiency of care delivery, increase compliance with regulatory requirements, obtain outcome data for evidence based nursing research, facilitate access to patient data for process improvements, and contribute to patient safety.

Methods, Intervention, & Analysis: RNs attended a four hour training session that provided didactic and computer simulation. Unit based super users received additional training and supported the implementation for the first 2 weeks. Daily issues meetings addressed requests for enhancements and troubleshooting. Structured notes were created to capture initial admission assessment, ongoing assessment, patient education documentation and nursing event notes. Flow sheets were created to document vital signs, intake and output, individualized care plans, focused frequent assessments and interventions. These electronic documents combined provide a complete and thorough record of the patient's clinical data, associated outcomes and daily nursing workflow.

Findings & Interpretation: Clinical reports are utilized to ensure that complete and accurate documentation is achieved. A clinical summary tab allows for interdisciplinary access to nursing clinical assessments, interventions, and outcomes in the context of the complex healthcare needs experienced in the bone marrow transplant patient population.

Discussion & Implications: Technology, thoughtfully applied, has the potential to transform the nursing process for the benefit of patients and nurses. Nursing can fully realize the benefits that technology can provide to deliver high quality, safe, and efficient care. Data can be used to improve patient safety outcomes, drive performance improvement, contribute to nursing research and evidence based practice.

Beep, Beep, Beep: Rescuing patients and nurses from pump alarms on an Inpatient Bone Marrow Transplant Unit

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Topic Significance & Study Purpose/Background/Rationale: The Bone Marrow Transplant unit of this NCI designated comprehensive cancer center successfully implemented practice changes which substantially reduced air in line alarms. Our journey began with the implementation of bedside handoff. Data collection post implementation highlighted a decrease in patient calls except for calls related to beeping pumps. Analysis revealed air in line alarm as the primary cause and a major frustration for patients and staff. Etoposide had the highest incidence of air in line alarms. Safety concerns also guided our initiative to address the cacophony of pump alarms. Pump alarms are a safety tool communicating information to the RN. Air in line can potentially pose a safety risk, delay treatment, cause medication errors, and contribute to patient falls. The barrage of noise is an unintended hazard of pump technology, desensitizing the RN, delaying response time, and impeding recovery. A task force identified the incidence, causes, and interventions that could minimize alarms.

Methods, Intervention, & Analysis: Collaboration with the pump manufacturer identified areas for improvement. Staff received retraining on alarm management and troubleshooting, and reinforcing proper device use. Air detector settings were adjusted to reflect the manufacturer's recommendations. IV tubing was changed from low sorbing to standard infusion sets. The pilot program assessed the effectiveness of an anti-siphon valve for Etoposide infusions.

Findings & Interpretation: Data collection following collaboration with the manufacturer resulted in a 66% decrease in air in line alarms, however, Etoposide continued to alarm. Data collection post implementation of the anti siphon valve with Etoposide infusions demonstrated a 98% reduction in alarms.

Discussion & Implications: The implementation of this multipronged problem solving approach resulted in a significant decrease in the incidence of pump alarms. A quieter environment improves relationships with patients, fosters a sense of safety and trust and enhances patient satisfaction. The implementation of the anti siphon valve will be evaluated for further clinical use.

Utilizing the Timed Up and Go (TUG) Assessment to Evaluate Physical Functioning and Fall Risk in an Adult HCT Population

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Topic Significance & Study Purpose/Background/Rationale: Reasons for falls in the HCT patient are multifactorial. We analyzed falls on an inpatient HCT unit at a comprehensive cancer center in California. Our data revealed patient falls were related to patients over estimating their abilities or altered balance and gait. We wanted to assess physical functioning to predict fall risk on an inpatient HCT unit. The Timed Up and Go (TUG) measure is a tool used to assess motor function. The data on TUG has focused on the elderly population. The aim of our project was to teach nurses to perform a TUG assessment and to determine patient motor abilities and fall risk. We measured patient TUG scores, fall rates and nurses' feedback.

Methods, Intervention, & Analysis: The project and the training were developed and conducted jointly with the Rehabilitation and Nursing Departments. We rolled out the process at staff meetings, during huddles, and training sessions. Support was provided throughout the pilot by nursing and rehabilitation staff. We developed an informational poster for the staff outlining the rationale and procedure for TUG. Staff training was done daily for one week prior to implementation. We informed patients about the TUG. Staff performed TUG daily on all patients that were able to complete the test. The pilot was conducted for one month.

Findings & Interpretation: Nurses were surveyed post pilot (n=25). Reported benefits of TUG included encouraged patients to ambulate and prompted the opportunity to discuss and educate patients about physical functioning and falls. Obstacles included patient refusals or unable to walk 10 feet. Abnormal scores were recorded for 58% of patients. One fall was experienced in the pilot month as compared to 3 falls on the adjacent unit with the same patient population.

Discussion & Implications: A longer trial period would be required to determine the efficacy of the tool with decreasing falls.

Intravenous Immunoglobulin Administration

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Topic Significance & Study Purpose/Background/Rationale: Background: After bone marrow transplant, serum immunoglobulin concentrations fall dramatically, leaving the patients more susceptible to certain bacterial infections. Intravenous immunoglobulin (IVIG) is therefore administered to the patients to reduce the incidence and severity certain infections. While preparing to give IVIG in a large teaching facility, inconsistencies were noted between administration guidelines and practice. The inconsistencies included: a different name brand of IVIG, adherence to escalation rates, lack of cardiac monitoring, and flushing procedures. Nursing practice needed to be changed to make sure nursing staff were not “drifting” away from the established standards.

Methods, Intervention, & Analysis: Methods: Literature search with pharmacology database, reference books, and drug package insert. Discussion with clinical pharmacist and senior staff on the correct and safe way to administer the drug.

Findings & Interpretation: Findings: Due to different preparations, reactions can vary greatly between different brand names of IVIG. The current standard was written for a preparation of IVIG that is not standardly dispensed from our pharmacy. These look-alike sound-alike medications had different infusion rates and different compatibilities than what was written in our standard infusion procedures leading to practice inconsistencies. A literature review revealed gaps in our monitoring practices as well.

Discussion & Implications: Conclusion: Recommendations were made to department leadership and the Oncology Clinical Practice Council to update the IVIG protocol to current practice standards. Nursing staff were trained and validated with the new protocol in a staff meeting. The unit policy has now been forwarded to the hospital Clinical Practice Council and is in the process of being approved across the health system. By partnering with pharmacy and senior nursing staff, potential medication errors can be minimized to provide safe and effective care to our patients.

There's nothing mini about a haplo: Nonmyeloablative haploidentical stem cell transplant and the older adult

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Topic Significance & Study Purpose/Background/Rationale: Just as the population of the United States is aging, so is the population of patients undergoing stem cell transplant. Older individuals are undergoing stem cell transplant more than ever before. The rigors of stem cell transplant are difficult for the youngest and healthiest of patients. Older adults with multiple comorbidities are more vulnerable to the side effects of treatment and the complications that can follow. In recent years, nonmyeloablative conditioning regimens have been developed with the potential for less toxicity and therefore fewer side effects. Older patients who are not appropriate candidates for myeloablative regimens due to other preexisting conditions are offered the option of a nonmyeloablative regimen. As nurses working with stem cell transplant recipients it is crucial that we are prepared to care for the unique challenges of older adults as they undergo nonmyeloablative preparatory regimens followed by haploidentical stem cell transplant. Geriatric specialists have used the term "geriatric syndrome" for the past eighteen years to describe conditions often affecting the elderly that involve multiple organ systems, and that are multifactorial in origin (Inouye et al., 2007). Sensory impairment, inadequate nutrition, incontinence, falls, cognitive impairment, depression, and pressure ulcers have all been classified as potential geriatric syndromes. Mohile and colleagues (2011) discovered a positive association between the prevalence of five select geriatric syndromes and a cancer diagnosis among older Medicare beneficiaries. Falls, depression, osteoporosis, incontinence, and hearing loss were found to be the five most prevalent geriatric syndromes among older adults with a previous cancer diagnosis.

Methods, Intervention, & Analysis: We chose to explore the topic of geriatric syndromes with a case study. Through the case study we were able to identify key nursing interventions that helped the multi-disciplinary team identify and work to address the patient's potential to develop geriatric syndromes. We identified how the patient's conditioning regimen and post-transplant complications may have contributed to his risk for developing geriatric syndromes. We reviewed the literature for best practice related to haploidentical stem cell transplant and the elderly. Finally, we were able to make recommendations for evidence-based nursing practice related to the population of older adults receiving nonmyeloablative regimens and haploidentical stem cell transplants.

Findings & Interpretation: We were able to identify how cascades of events post-transplant contributed to the development of geriatric syndromes in the patient's case. For example, the patient experienced worsening of previously existing mild urinary incontinence related to hemorrhagic cystitis from his chemotherapy. The patient's residual weakness was profoundly exacerbated, due to multiple factors including treatment-related fatigue and poor nutrition post-transplant. The patient's cognitive functioning declined dramatically, related to multiple factors including a long hospital stay.

Discussion & Implications: How do non-myeloablative stem cell transplant conditioning regimens and post-transplant complications contribute to geriatric syndromes? The purpose of this presentation is to explore how facets of nonmyeloablative haploidentical stem cell transplant can contribute to three key geriatric syndromes of special concern to our inpatient unit: urinary incontinence, impaired mobility, and impaired cognition.

Best Practices Surrounding Urinary Catheters in Bone Marrow Transplant Patients

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Topic Significance & Study Purpose/Background/Rationale: In the oncology and bone marrow transplant patient population, the use of an indwelling urinary catheter necessitates the monitoring of hourly output and hemodynamics, the healing of skin irritation, the prevention urinary obstruction and provision of end of life comfort care. Urinary catheter obstruction results from the following contributing factors: alkaline urine, poor mobility, calciuria, proteinuria, copious mucin and irritation of the bladder lining. Urinary catheter surveillance and discontinuation is vital to the patient's health and care. Over the years many new staff nurses were taught the practice of closed urinary catheter irrigation via the urinary specimen port for patient complaints of lower abdominal pain, spasm and cramping. Anecdotally this would provide immediate pain relief. The purpose of this evidence-based practice project was to examine the evidence, decrease the nurses' exposure risk, decrease the patient's pain from bladder spasm and decrease the catheter associated urinary tract infection rate. Then, based on the evidence, we hoped to formally incorporate this practice into the indwelling urinary catheter policy and procedure or discontinue this current practice. The manufacturers of the indwelling urinary catheter had no recommendations regarding irrigation via the sample collection port.

Methods, Intervention, & Analysis: A literature search using key search terms included indwelling catheter, catheter-associated urinary tract infections, bone marrow transplant and oncology resulted in limited findings. Therefore, University Healthcare Consortium (UHC) and nursing staff were surveyed for current bladder irrigation practices. Expert clinicians were consulted regarding the practice of closed catheter irrigation. Retrospective case samples of bone marrow transplant patients (n= 46) with indwelling urinary catheters were screened for catheter usage and triggers for catheter removal. BMT patients were screened weekly for urinary catheter presence and rationale for removal. Our institution has a nurse-driven indwelling urinary catheter protocol to decrease urinary catheter usage and infection. Registered Nurses on the BMT units were surveyed via an on-line Survey Monkey® survey regarding number on years on the BMT unit; nurses perception of number of patient complaints related to lower abdominal cramping, spasms, or pain while having an indwelling urinary catheter; how nurses and physicians treated this complaint and nurses' awareness of the nurse-driven catheter removal policy.

Findings & Interpretation: The majority of indwelling urinary catheters were removed upon expiration, followed by physician order, followed day of discharge or to extended care facility. Only a small number of urinary catheters were removed per the urinary catheter removal protocol. The literature search was limited but consistently recommended maintenance of a closed drainage system, and not routine catheter irrigation. Five United Healthcare Consortium hospitals responded to the survey; three used closed-system irrigation for urinary catheters. Approximately 25% of BMT nursing staff surveyed used closed catheter irrigation when patients complained of pain, cramping, etc. One unexpected finding from the staff survey was that greater than 70% of those surveyed were unaware of the protocol allowing nurses to remove a urinary catheter without a physician's order.

Discussion & Implications: This study impacts safe patient care. BMT have many factors that can potentially lead to catheter obstruction. Timely removal of catheters when no longer needed could eliminate the problem. Staff education was provided regarding the urinary catheter removal protocol. Weekly urinary catheter surveillance continues to monitor the urinary catheter usage and staff nurses' adherence to the catheter removal protocol. The nurse driven urinary catheter removal have been posted on the unit. Urinary catheter system remains closed when irrigation is needed thereby reducing the risk of infection. Also, by not having to treat the patient's painful spasms with anti-spasmodic medications and pain medication, this decreases the patient's fall risk and risk of injury. Future studies could examine the incidence of bladder spasms and the impact of closed drainage system irrigation on a multi-site larger BMT patient sample.

A Quality Improvement Program: Structured Exercise for the Outpatient Blood and Marrow Transplant Patient

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Topic Significance & Study Purpose/Background/Rationale: Studies have shown that patients who exercise during recovery following blood and marrow transplantation (BMT) reap both physical and emotional benefits (Hayes, 2008). Some of the benefits are like those commonly reported in the general public such as enhanced physical performance, improved cardiopulmonary function, greater strength and flexibility and increased endurance. Because of these potential benefits to our patients, Exercise is encouraged on the inpatient BMT unit with the support on dedicated physical and occupational therapy teams. Although some care is provided on the inpatient BMT unit, the majority of recovery time is spent in our outpatient day hospital. Our outpatient day hospital does not have on site physical therapy support, thus a deficit was identified. Hayes, S. et al. "Quality of life changes following peripheral blood stem cell transplantation and participation in a mixed-type, moderate intensity exercise program." *Bone Marrow Transplantation* (2008) 33, 553-558.

Methods, Intervention, & Analysis: After review of the literature, a structured program was designed for the outpatient day hospital called STAMP. STAMP (Stay Tough And Maintain Power) was designed to incorporate aerobic exercise, stretching and strengthening into the patient centered care provided to our patients. The expertise of our inpatient physical therapist was enlisted to ensure the design of a safe activity plan.

Findings & Interpretation: Over a 5 month period, 81 patients have participated in the STAMPS program. Observations include, increased number of patients "walking laps" through the clinic. Patients noted the program was helpful in passing time while in the clinic, maintaining or increasing current level of activity, and was helpful in maintaining or regaining physical strength. Our limited data supports the positive impact of physical activity during transplant recovery.

Discussion & Implications: We hope our STAMPS program outcomes will serve as support for the future hiring of a dedicated physical therapist to our outpatient day hospital. In addition we plan to expand our program to include specific strategies for fall reduction.

Finding a Nursing Pipeline – The Professional Nursing Assistant

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Topic Significance & Study Purpose/Background/Rationale: Finding a nurse who has experience in any specialized area can be a challenge. Finding a nurse with experience in BMT is rare. A paper from the NMDP System Capacity Initiative reported studies show that the nursing shortage is projected to grow to 260,000 registered nurses by 2025. In addition to an increasing demand for transplant, this shortage will occur because of the aging population of practicing nurses, increasing retirement rates and difficulty in increasing enrollment rates in nursing schools. An adequate number of well-trained nurses is crucial to successful HCT outcomes, and nursing shortages will negatively impact future utilization of HCT. (Majhail et al, 2012) Due to these challenges, our program had to think outside the box for new ways to recruit nursing staff. Our unit has been fortunate to be a part of our institution's Professional Nursing Assistant (PNA) Program. The PNA Program has allowed us the opportunity to "invite & invest" in students who are in their junior & senior year of nursing school and provide them the opportunity to work in the area of blood & marrow transplant. As you would any potential applicant, the leadership team of BMT takes the time to review the resume & invite those who expressed an interest in working in BMT, to take part in the program.

Methods, Intervention, & Analysis: The PNA Program is a 10-week program where the leadership team provides the PNA with a chance to experience the inpatient arena, as well as the outpatient area of BMT. This is a unique opportunity for students to experience caring for patients in two unique settings without having the pressure of committing to transplant nursing as a career. The PNA is employed as a 40-hour a week employee, with the time being split between working with the Registered Nurse and the Nursing Care Assistant. These 10 weeks are spent investing in this PNA. The investment in these nursing students has turned out to be very profitable. Over the past 4 years our applicant pool has been these same nursing students who want to come back & work in the area of BMT.

Findings & Interpretation: Even though we have not changed our orientation program to reflect time spent as a PNA, we have found that as a new graduate the PNA has a better grasp on the foundations of BMT. Their assessment skills are outstanding and they are able to care for the more complex patient sooner in their professional development process.

Discussion & Implications: Through the years we have to face some challenges with this tactic. One year, due to the staffing challenge we all face, there were six new hires being brought in during the time we would normally commit to having a PNA working on the unit. Due to the number of preceptors needed we were unable to provide the PNA with the opportunity to work in BMT. Other than this obstacle we have made this work. Currently the recruitment rate among PNA's is 67% with hopes of improving this rate with the help of our unit based Work Culture, Clinical Practice and Education Shared Governance Councils.

Making RN Orientation Better: Improving the Bone Marrow Transplant Experience

Cassie Seichter, Julie Chapman, Ashley Grove, Kristin Johnson, Julie Weig. University of Minnesota Amplatz Children's Hospital, Minneapolis, Minnesota

Topic Significance & Study Purpose/Background/Rationale: There is an increase in demand for nursing care as the population ages. This, along with a large volume of “Baby Boom” nurses retiring, has consequently caused a nationwide nursing shortage. Specialty nursing units, such as bone marrow transplant, will be strongly affected by this issue. The hire and retention of competent new nursing staff will become a priority for all bone marrow and oncology units. Retention of new nurses is imperative for patient safety, unit cohesiveness, and budgetary concerns. Thirty percent of new graduates will leave their jobs within the first year and fifty-eight percent will leave by the second year.

Methods, Intervention, & Analysis: Orientation to an inpatient bone marrow transplant unit (BMT) is an arduous process. Based on preliminary surveys we conducted, our orientees were dissatisfied with the orientation they were receiving. We conducted an extensive literature review to supplement the survey results and found that: rough transition from school to practice, job stress, social isolation, high patient acuity, lack of support in critical decision making, and lack of skills were the most common reasons for leaving a job. Our orientees stated they were not receiving enough variety in assignments, had too many preceptors, and felt unwelcome from current staff. As a result of our research, we made an action plan that included: encouraging current staff to introduce themselves to new staff, establishing a welcome e-mail, checking in with orientees one month into orientation to assess for problems or needs, reducing the number of preceptors, and discussing with charge nurses to give orientees a better variety of assignments.

Findings & Interpretation: Based on mid and post orientation surveys, our interventions have improved the orientation experience. It was reported that existing staff became more welcoming, assignments were more challenging as well as varied, and the number of preceptors was decreased. Thus far, only 3 post orientation surveys have been completed, but we will continue to follow up with orientees and change interventions as needed.

Discussion & Implications: We hope all BMT units can use this model to increase nurse/manager satisfaction, as well as increase retention rates, and better prepare the new orientee to care for BMT patients.

Management of Operative Harvest for Bone Marrow Donors

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Topic Significance & Study Purpose/Background/Rationale: The care of blood and marrow donors is an under-addressed aspect of hematopoietic stem cell transplantation (HSCT). A literature search of best practices in the management of marrow donors revealed 18 articles; however, variables influencing complication rates were not well defined. Common post-donation complications included pain and limited mobility. A low incidence of anesthesia-related complications was also noted, but poorly described. This nursing leadership team quality improvement (QI) project sought to identify factors influencing post-operative hospital admissions after harvest for HSCT donors.

Methods, Intervention, & Analysis: One hundred and sixty-seven marrow donors undergoing bone marrow harvests between 2011 and 2012 were included for analysis. Specific donor and procedural variables deemed pertinent to the question were identified through team deliberations and observations of practice. Data were collected from the electronic medical record after IRB approval for this quality improvement project, cross-validated by team members, and then de-identified for analysis and reporting.

Findings & Interpretation: The sample was evenly distributed across genders, with ages ranging from 3-73 years. One hundred and eleven donors (66.5%) had general anesthesia, and 56 (33.5%) had spinal/epidural anesthesia. Thirty-four (20.4%) were admitted post-harvest for cardiac abnormalities, anemia, blood transfusions, dizziness, severe pain, and significant nausea and vomiting. Analysis revealed no relationship between type of anesthesia and reasons for admission. Missing data precluded collection of other variables believed to be potentially significant predictors of the need for admission, including post-anesthesia fluid infusion, recovery time, and presence of orthostatic vital signs. Admission rates were significantly increased with patients over age 50 years, higher total harvest volume, and longer total collection time.

Discussion & Implications: Many unanswered questions still exist; however this analysis provides information useful in planning pre-operative assessment and preparation, post-anesthesia care, and discharge criteria for operative bone marrow donors. These data will be used to develop standards of care for HSCT donors.

The Importance of Skill Simulation and Its Role in the Clinical Performance of the New Graduate BMT Nurse

Elizabeth Sito, Deborah Russell. Duke University Hospital, Durham, North Carolina

Topic Significance & Study Purpose/Background/Rationale: The field of Blood and Marrow Transplant has continued to see a rise in the complexity and acuity of its patient population. This is due to many factors including increases in patient co-morbidities, post transplant complications and age. In turn, the demand for safe and competent nursing care has also increased as we strive to adapt our highly technological care to the increased acuity. Research has shown that nursing administrators believe that only 10% of new graduate nurses are fully prepared to practice safely and effectively in the hospital setting. New graduate nurses agree that they lack confidence and adequate skills for up to one year after graduation (American Nurse Today, 2012). Evidence continues to emerge supporting the use of simulation in the new graduate nurse population as a tool to develop competencies and clinical skills without harming patients (Galloway; OJIN, 2009). The increasing number of new graduate nurses employed on our unit led us to explore the use of a simulation facility to enhance confidence and performance. New graduate nurses hired within the last year were required to participate. A pre-survey was conducted to measure level of confidence in practice and suggestions for skill simulation. Suggestions included bladder irrigation for hemorrhagic cystitis and polyoma virus, chest tube care following VATS procedures for invasive fungal infections, and the use of feeding tubes and enteral feeding for GVHD of the gut. Stations were developed with experienced staff members providing the education.

Methods, Intervention, & Analysis: A pre-survey was conducted to measure level of confidence in practice and suggestions for skill simulation. Suggestions included bladder irrigation for hemorrhagic cystitis and polyoma virus, chest tube care following VATS procedures for invasive fungal infections, and the use of feeding tubes and enteral feeding for GVHD of the gut. Stations were developed with experienced staff members providing the education. Pre-skills day level of confidence averaged 3.1 and was measured on a 0-5 scale with 0=no confidence and 5=very confident/comfortable.

Findings & Interpretation: A debriefing was held immediately following simulation and a post-survey was conducted for feedback. Post simulation confidence in practice increased to 4.1 with 100% of participants recommending the implementation of a yearly simulation skills day

Discussion & Implications: The simulation environment can provide a new graduate BMT nurse the opportunity to increase their confidence by enhancing decision making and critical thinking skills.

Standardization of IV Line and Pump Set-up to Improve Clinical Outcomes in the Pediatric Blood and Marrow Transplant Population

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Topic Significance & Study Purpose/Background/Rationale: In August 2011, Fairview implemented the new smart pump known as the Baxter Sigma. The Pediatric Blood and Marrow Transplant unit had been using the Omni pump, which was a multi chamber pump capable of running four medications at one time and had unique tubing. The Omni was able to run syringe medications as well as medications in bags. The implementation forced Nursing Practice Council (NPC) to brainstorm a line and pump set-up that would provide an equivalent process and workflow as the Omni. Unfortunately, the Sigma can only run one bag medication at a time and does not have the capability to run a syringe medication. The new set-up would require four Sigma pumps and two syringe pumps to replace the one Omni. Finally, literature shows standardization decreases errors.

Methods, Intervention, & Analysis: Two months prior to implementation, NPC created a poster displaying a line set-up that could accommodate the needs to administer multiple IV medications simultaneously per patient into a double lumen Hickman. In addition, NPC implemented a standardized pump set-up to supplement the line set-up by creating an "BMT Amplatz pole" order where every patient admitted receives the pumps pre set-up from supply chain. Monthly audits were done to check staff compliance and were reported in a monthly unit newsletter. Yearly competencies are used to evaluation assimilation of knowledge. A survey will be conducted showing staff satisfaction.

Findings & Interpretation: Since implementation of the standard line and pump set-up, our cyclosporine line contamination has been zero, which is a decrease. Based on ICAREs, Our medication errors related to infusion in the wrong lumen and incompatibilities with other medications has decreased from 12 in 2011, eight in 2012 and two in 2013 to date. We continue to have low BSI rates that are below the nation average. From informal verbal surveys, we have heard an increase in staff satisfaction related to productivity and time management.

Discussion & Implications: Based on the results, we know that the standardization has decreased medication errors and increased staff satisfaction. We continue to evaluate the effectiveness of the standardization set-up through verbal feedback and future surveys. We continue to look for ways to improve patient care and safety through standardization. In the future, inpatient units that require many medications to be given simultaneously could use a standardization set-up to reduce medication errors and save nursing time.

Emergency Evacuation of a Bone Marrow Transplant Unit During Superstorm Sandy: This Was Not a Drill

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Topic Significance & Study Purpose/Background/Rationale: In October 2012, a hurricane was forecast for the East Coast. Our Medical Center's Hospital Incident Command System (HICS), which facilitates operations in times of disaster, was activated days in advance. Based on available data, the decision was made to shelter in place. Our Bone Marrow Transplant Unit (BMTU) held a census of four patients at the time of the storm. The storm surge hit New York City leading to an influx of water into the streets, tunnels, and subway lines, causing an unanticipated power outage to a large portion of the city. Despite established backup systems which were repeatedly tested, the storm exceeded all forecasts, necessitating an evacuation. We will describe how nurses led a collaborative approach to safely evacuate oncology patients, without lights, elevators, computers, and telephones. (Figure 1)

Methods, Intervention, & Analysis: As the storm approached, interdisciplinary teams discharged many patients hospital-wide, however the BMTU patients were deemed unable to discharge. Private HEPA filtered rooms were blocked on the regular oncology unit as reserve in case the BMTU became compromised. Nurses followed procedures for blackout and computer down time; including the printing of essential information from the electronic medical record (EMR). Once power and communication systems failed, nurses and other interdisciplinary team members safely evacuated patients using med sled evacuation devices and necessary equipment for monitoring and support down sixteen flights of dark stairwells to waiting ambulances. To ensure safe transfer and a hand-off report to the receiving hospital, nurses accompanied all BMTU patients. Hand-off communication was also accomplished centrally from the HICS using the previously printed EMR summaries. (Figure 2)

Findings & Interpretation: A total of four patients, including one autologous transplant patient and patients with chemotherapy infusing, were transported to a neighboring hospital without interruption of care. Staff relied on prior disaster training, expert clinical judgment, and emotional intelligence to accomplish this unprecedented task.

Discussion & Implications: Disaster training and drills are vital to developing the skills needed during an emergency. Nurses, as first responders, lead in times of disaster. The efforts of this team demonstrate what can be accomplished when everyone is well trained and focused on the same goal, patient safety.

Does Plerixafor do the trick in mobilising Stem Cells?

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Topic Significance & Study Purpose/Background/Rationale: Plerixafor (MOZOBIL®) is an antagonist of alpha-chemokine receptor CXCR and one of the recent additions to the Haematology discipline; it is used as a stem cell mobiliser. CXCR4 alpha-chemokine receptors are important in hematopoietic stem cells homing to the bone marrow and in hematopoietic stem cell quiescence. It is indicated in combination with Granulocyte Colony Stimulating Factor (GCSF) for Peripheral Blood Stem Cell (PBSC) collections in the Multiple Myeloma (MM) and Lymphoma patient groups with a poor mobilisation history.

Methods, Intervention, & Analysis: Method In our organisation, data was collected prospectively. 35 patients (two patients were included twice as they received Plerixafor on two separate occasions) received Plerixafor for PBSC collection between May 2009 and September 2012. Patients met the criteria prior to treatment, except three patients with low platelet counts (white Blood Count > 2.5 x 10⁹/L, Absolute Neutrophil Count > 1.5 x 10⁹/L, Platelet > 85 x 10⁹/L, Serum Creatinine < 1.5 mg/dL, Aspartate transaminase (AST), Alanine Transaminase (ALT), Bilirubin < 2 x ULN with no evidence of Hepatitis B and C. Patient demographic data is shown in Table 1. Five patients had an underlying documented medical problem (cortochondritis, asthma, hypertension and glaucoma).

Findings & Interpretation: Result: 25 of the patients were diagnosed with MM and six with Non-Hodgkin's Lymphoma (NHL), two patients had Hodgkin's Disease, one had Neuroblastoma and one Waldenstrom's Macroglobulinemia. All patients received four consecutive days of GCSF 10 µg/kg prior to Plerixafor. Plerixafor was given 10 hours before the PBSC collection and GCSF was repeated one hour prior to PBSC collection on the morning. All patients received 0.24 mg/kg/day of Plerixafor. There were no side effects observed in these episodes. 26 patients required single dose, 10 patients required a second dose, and only one patient received three dose of Plerixafor.

For all cases, the target CD34+ count was 4 x 10⁶ cells/kg of recipient body weight. Two patients responded extremely well with a CD34+ count of 21.79 x 10⁶ cells/kg and 15.16 x 10⁶ cells/kg achieved. 13 patients achieved the target of 4 x 10⁶ cells/kg or above. However 22 patients failed to achieve to reach target. 16 of these patients had adequate amounts of CD34 count for an autologous transplant. Four patient failed to mobilise with CD 34+ < 2 x 10⁹ cells/kg. Only six patient had > CD 34+ < 2 x 10⁹ cells/kg one of this patient had no CD34+ at all.

Discussion & Implications: Conclusion Plerixafor was used at The London Clinic recently with mostly favourable outcomes. According to this study Plerixafor has improved PBSC outcomes with some exceptions. Plerixafor has definitely made a positive difference in 40% of our patients and 83% had enough cells for an autologous transplant. However, results are inconclusive due to small patient numbers. Ongoing studies with new patient experiences are needed. More than one dose of Plerixafor may be required for heavily pre-treated patients who are historically poor mobilisers of PBSC collections.

Do we give too much or too little?

Serpil Vieira, Diane Monroe. The London Clinic, London, United Kingdom

Topic Significance & Study Purpose/Background/Rationale: Introduction Over the last decade, information for cancer patients has become increasingly more available. The very nature of cancer requires patients to learn about their disease in order to cope with the consequences of treatment and to be involved in decision making processes. It is therefore vital to provide enough information for patients and their relevant others. People/patients vary in the amount of information they require. Evidence suggests that some patients do not want very much information about their diseases and treatments. This study aims to explore how much information our patient group wants to know and how much information our team provides.

Methods, Intervention, & Analysis: Method A questionnaire was prepared to collect data on how much information was given to patients on three different stages of their treatment plans. These stages were: on admission, during their inpatient stay and on discharge. A fourth section was added, to investigate other information that patient felt would be beneficial. 112 questionnaires were given between May 2010 and October 2012, outcome data is shown in table I. Stage Information provided on the following topics N, %

Stage	Information provided on the following topics	N, %
On admission		
1.	Side effects of therapy or chemotherapy	39 (34.8%)
2.	Procedures (Bone Marrow Aspiration, Hickman Line insertion etc)	35(31.2%)
3.	Sexuality	11(9.8%)
4.	Fertility	13(11.6%)
5.	Results of diagnostic test	49(43.7%)
6.	Follow up, appointments	39(34.8%)
7.	Diet other	23(20.5%) 0(0%)
During their stay		
1.	Side effects of therapy or chemotherapy	41(36.6%)
2.	Procedures (Bone Marrow Aspiration, Hickman Line insertion etc)	39(34.8%)
3.	Infection Control	48(42.8%)
4.	Sexuality	9(8%)
5.	Fertility	11(9.8%)
6.	Results of diagnostic test	59(52.7%)
7.	others, blood tests	7(6.2%)
On discharge		
1.	Outcome of your treatment	65(58%)
2.	Follow up, appointment	102(91%)
3.	Medication	108(96.4%)
4.	What happens next	88(78.5%)
5.	When to call the medical team (Hospital)	94(83.9%)
6.	Work life	68(60.7%)
7.	Other alternative treatment regimens	8(7.1 %)
Total		112 (100%)

Findings & Interpretation: 112 malignant haematology patients were admitted to our unit for various reasons Our audit was evaluated in three different stages. The admission stage; most of the information provided regarded side effects of treatment and test results (See Table I). Our audit has shown that, the admission stage was the lowest in terms of information providing. It should be kept in mind that the haematology patient group generally has a long hospitalisation, the data collection tool was given on discharge. Therefore, it was interpreted that data might be lost due to poor recall of the information required. We are now giving

the data collection tool on admission rather than on discharge in an effort to address this matter. Result showed that Sexuality (9.8%) and fertility (11.6%) were the least addressed topics; where as results of diagnostic test (43.7%) was deemed the most important. On the other hand results also showed our patient were happy about the information they were given especially on discharge, as most aspects of information was covered

Discussion & Implications: For the haematology patient group, knowing their diseases and potential outcomes does help in the difficult decision making process of their treatment. Therefore as healthcare professionals it is our duty of care to provide the information they need, but how far do we need to go? This study was aimed at exploring our patient groups information needs as well as providing a self performance check. Our audit showed that our centre does perform well in admission and discharge stages; we need to work on the in patient period. In order to collect the required data, we have decided to give patients the data collection tool on admission rather than discharge.

Can Platelet transfusion be unnecessary?

Serpil Vieira, Diane Monroe. The London Clinic, London, United Kingdom

Topic Significance & Study Purpose/Background/Rationale: Introduction Blood transfusion continues to be an essential part of modern practise, but it is not without risk. During the last decade there has been an increased interest across the United Kingdom (UK) and Europe in collecting data on the hazards of transfusion of blood components. Therefore avoiding unnecessary transfusion is accepted as one way of reducing the risk, which is associated with blood transfusion. In our stem cell transplant unit we audited platelet transfusion (PT).

Methods, Intervention, & Analysis: Method The audit was carried out prospectively and retrospectively. The data was validated and cross checked retrospectively, all inpatient episodes were recorded on a monthly basis. The audit was carried out over a 29 month period from May 2010 until the end of September 2012. The duration was divided in three periods in order to compare the outcome with our initial audit.

Period I: 01/05/10- 31/10/10

Period II: 01/11/10- 30/09/11

Period III: 01/10/11- 30/09/12

Findings & Interpretation: Our unit policy is to keep the platelet count at circa $10 \times 10^9/L$ for uncomplicated inpatients and at circa $20 \times 10^9/L$ for complicated patients and outpatients. We also aimed to keep platelet above $50 \times 10^9/L$ if patient is receiving anticoagulant or bleeding for various reasons. In the comparison of the three periods, there was a dramatic improvement in terms of reducing the unnecessary platelet transfusion. As shown on table 1, in period I 36% of the transfusion occurred when $plt > 31 \times 10^9/L$, where as on period III, this figure dropped to 13.95. The reasons for unusual transfusion were bleeding, prior to invasive procedure and anticoagulant use. As the figures are shown there was a dramatic change in the period II and III compared with period I regarding unnecessary platelet transfusion. It is also highlighted the recent change in anticoagulant use due to new VTE prophylaxis has caused in the numbers of platelet transfusion when $plt > 31 \times 10^9/L$. Even though there was an increase due to VTE policy, the figures were still lower than previous periods.

Discussion & Implications: Our organisation recognises the importance of risk associated in unnecessary blood component transfusion. Our audit has shown interesting figures. The duration of audit was divided in three different periods and outcomes compared. Between these three periods there were dramatic changes as Table II shows. Our figures dropped rapidly from 45.5% to 16.6% in platelet transfusion when the platelet count was higher than $31 \times 10^9/L$. There were various reasons to transfuse platelets even though the count was reasonable for the haematology patient group such as: bleeding, prior to invasive procedure and anticoagulant use

Tranfuse or not to Transfuse?

Serpil Vieira, Diane Monroe. The London Clinic, London, United Kingdom

Topic Significance & Study Purpose/Background/Rationale: Blood transfusion continues to be an essential part of modern practise but it is not without risk. During the last decade there has been an increased interest across the United Kingdom (UK) and Europe for collecting data on the hazards of transfusion of blood components. Therefore avoiding unnecessary transfusion is accepted as one way of reducing the risk, which is associated with blood transfusion. In our stem cell transplant unit we have audited red cell transfusions. Our unit policy is to keep the haemoglobin level above 8g/dL, this may change from time to time and depends on the patient's clinical condition.

Methods, Intervention, & Analysis: The audit was carried out prospectively and retrospectively. The data was validated and cross checked retrospectively, all inpatient data was recorded on a monthly basis. The audit was carried out over a period of 29 months from May 2010 until end of September 2012. The data was divided into three periods, outcome data was compared within these three periods.

Findings & Interpretation: Periods are shown in the table. Comparison of these three periods have shown that during period II a total of 240 episodes and the during period III 291 episode RCT were performed in our unit. It was almost same figures in all of the three periods for necessary transfusion. But there was a significant increase in period III when Hb levels are > 8.6 g/dL. The reason for transfusion was categorised as: routine, unit protocol, bleeding, pre procedure and on doctor's instruction due to patient symptoms or keeping a high thresh hold haemoglobin level. Routine RCT were 52.7% of total episodes in period II, 44% in period III 22.5% when Hb<8.0 g/dL. However 8.2% of the RCT transfusions were given when haemoglobin levels were 9.1 g/dL or higher in period II and 12.4% in period III. The figure was 10% in period I. The main reasons for transfusion when Hg > 10.1 g/dL were associated with the protocol regarding hyper transfusing beta thalassaemia major patient prior to transplant in period I and II. In period III two patient were symptomatic, therefore they required routine blood transfusion when Hb >10 gr/L. Therefore it has resulted as an increase in the blood transfusion when Hb is > 9.1g/dL.

Discussion & Implications: Our organisation recognises the importance of risk associated in unnecessary blood component transfusion. Our audit has shown interesting figures. The audit was divided into three periods and outcomes compared. Our figures showed that practice was improving the first two periods. There was a significant increase in the blood transfusion when Hb>10g/dL, this was due to a patient being clinically symptomatic.

BMT Boot Camp

Kathryn Walters, Piper Coleman, Laura Flesch. Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio

Topic Significance & Study Purpose/Background/Rationale: The Specialty Resource Unit (SRU) is the float pool servicing the bone marrow transplant (BMT) unit when staffing is low, census and/or acuity is high. These nurses are expected to provide specialized care to this complex and intensive patient population within a 6 shift orientation. The BMT unit is SRU's introduction to critical care nursing. The complexity of care required for this patient population is overwhelming to a float pool nurse coming onto the unit for the first time.

Methods, Intervention, & Analysis: An assessment was conducted on former float orientees and BMT preceptors to identify educational and supportive needs. The assessment indicated an introductory education was needed prior to the float nurses starting on BMT. The BMT Boot Camp education, which includes a lecture presentation and interactive learning, provides an in-depth understanding of the specialized BMT knowledge and skills. The presentation provides knowledge from the beginning phase of BMT and ending with the care required for patients to move toward discharge. The interactive portion introduces complex line management, high risk infusions, blood product administration, and in depth central venous catheter care.

Findings & Interpretation: The program evaluations from both preceptors and orientees speak favorably to the BMT Boot Camp. Preceptors identified less "work time" instruction of the BMT process which allows more organizational skill development and procedure experience. Float nurses identified more confidence, autonomy, and more initiative to provide independent care.

Discussion & Implications: Providing specialty education promotes comfort and confidence in a highly specialized unit. A BMT specific education class offers useful resources and decreased anxiety for the float nurses. It also offers an opportunity for float nurses to build a rapport with the BMT preceptors. Through confidence displayed by the float staff, parents of patients are more confident in the care the float nurse provide to their child.

What is the Difference Between Inpatient BMT Patients Who Fall vs Non-fallers: A Retrospective Study

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Topic Significance & Study Purpose/Background/Rationale: Current research on inpatient falls has focused on the medical surgical population. Research on falls is just starting to delve into the difference between oncology patients who fall and the medical surgical patient who fall and the different strategies for each. This research is a starting point to look further into the oncology subpopulation and focus on the Hematopoietic Stem Cell Transplant (HSCT) patient. Specific research on HSCT patient population is warranted because of additional risk factors for falls which include myeloablative cancer treatments, prolonged inpatient stays, debilitating weakness and fatigue.

Methods, Intervention, & Analysis: This retrospective case-controlled study will evaluate the difference between inpatient HSCT patients who fell versus those HSCT Patients who did not fall. This project is aimed at determining the incidence of falls in our HSCT population and the factors that are significant in predicting falls in the hematopoietic cell transplant population. This research project is analyzing multiple variables including: conditioning regimens, source of stem cells, medication usage, number of transplants, ECOG, readmission vs. initial admission for transplant, and length of stay with an aim at identifying variables that can be used to identify HSCT patients at risk for falls and/or variables that can be controlled/changed to decrease risk for falls in the inpatient unit.

Findings & Interpretation: We are at the preliminary phase of this project and will present the multidisciplinary approached used in this research project as well as our preliminary findings.

Discussion & Implications: This research has the potential to help identify those HSCT patients at risk for falls as well as possible controllable variables that can be modified to decrease the HSCT patients risk for falls. This retrospective study is the first phase of a larger project and is laying the ground work for an intervention based prospective study in the HSCT patient population.

Stem Cell Transplant: Is There an App for That?

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Topic Significance & Study Purpose/Background/Rationale: Rationale: Stem cell transplant (SCT) can benefit children with various diseases. Numerous complications and/or short and long term care needs may occur. Historically, the majority of SCT referrals were malignant disorders. This is changing as many nonmalignant diseases (NM) are now considered curable. These children and families proceeding to SCT present with a different perspective from malignant disorders. This produces a situation of heightened stress and risk for poor retention of SCT guidelines. Subjects: NM disorders that benefit from SCT include but are not limited to; metabolic storage disorders, hemaglobinopathies, immune deficiency disorders, and neurodegenerative disorders. Aim: Attain information from experts on needs and content desired in a mobile technology educational tool. The findings will be utilized to develop a mobile educational tool.

Methods, Intervention, & Analysis: Methods: Qualitative focus groups will be conducted consisting of two arms: 1. experts in the field of pediatric SCT and 2. Parents of children who have undergone SCT. Post-SCT care needs will be discussed. Concerns such as need to individualize an application (app) for SCT date, educational reminders to supplement initial education, and other recommendations for a useful mobile app in the NM SCT pediatric patient population will be explored. A sample size of 5 - 10 health care providers within the Pediatric Blood and Marrow Transplant Consortium (PBMTc) and 3 - 4 parents of children who have undergone SCT. Saturation of results will be utilized to determine the exact sample size. Expert subjects will be recruited at the fall PBMTc meeting. Parent focus group will be recruited from snowball recruitment.

Findings & Interpretation: Results: Qualitative focus groups findings will be analyzed and stratified based on professional or parent. The results will be utilized for development of the SCT app.

Discussion & Implications: Conclusions: The findings from the qualitative interviews will provide insight into a post SCT app contents for children and parents

Determining the value of weekly surveillance blood cultures as a screening tool for occult bloodstream infection for post allogeneic hematopoietic stem cell transplant (HSCT) patients on Prednisone.

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Topic Significance & Study Purpose/Background/Rationale: Bloodstream infection is a significant complication following allogeneic HSCT. The use of corticosteroids in this patient population may mask an inflammatory response indicating an infectious process. This can cause a delay in the initiation of antibiotics, leading to potentially fatal consequences. Our current standard is to obtain a weekly surveillance blood culture on patients receiving Prednisone. The purpose of this project was to validate if by obtaining weekly blood cultures on patients receiving Prednisone, we effectively screened for occult bloodstream infections. Additionally, we wanted to determine: What type of pathogens (bacterial and fungal) are most prevalent? Is the dose of Prednisone a determinant for weekly surveillance?

A review of the literature revealed three relevant studies. The studies support performing surveillance cultures to reveal occult blood stream infections, but didn't include the use of Prednisone and if the mg/kg dosing made a difference. The results of this project would have a direct impact on our oncology nursing practice.

Methods, Intervention, & Analysis: Quantitative data of blood culture results was collected from 8/2011-9/2012.

Findings & Interpretation: A total of 20 patients were on Prednisone and had weekly surveillance cultures. Characteristics of the patients screened included: Eight females and 12 males with a wide variety of hematologic malignancies undergoing conventional, t-cell depleted and cord blood transplants. The median dose of Prednisone prescribed in patients who were surveillance culture positive was 0.54mg/kg/day (0.09-1.4mg/kg/day) vs. 0.42mg/kg/day (0.09-1.1mg/kg/day) who were culture negative. 15 separate surveillance cultures were found to be positive. Among these, seven were Coagulase negative staphylococcus, five were Enterobacter cloacae, one with E. coli, one with Moraxella Osloensis and one was found to be Pseudomonas Aeruginosa.

Discussion & Implications: As per the findings, 75% of surveillance culture results were found positive. The most common organism was Coagulase negative staph (50%), followed by Enterobacter cloacae (33%). Skin associated bacteria were found to be the most common. The median dose of Prednisone was higher in patients who were surveillance culture positive. Therefore, these findings suggest that patients who are on 0.5mg/kg/day of corticosteroids or higher should be considered for weekly surveillance culture monitoring.

An Investigation of the Pediatric Bone Marrow Transplant Nurses Perception of Palliative Care

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Topic Significance & Study Purpose/Background/Rationale: Pediatric bone marrow transplant patients (BMT) are faced with life-threatening illnesses that affect their physical, psychosocial, emotional, cultural and spiritual beings. Palliative care can benefit these patients and families whether the overall goals of care are to cure, prolong life, decrease suffering or ease the pain of bereavement. The specialty nurses who care for these patients and their perception of palliative care has rarely been studied. This pilot study investigated the nurses' perception of palliative care in the BMT setting.

Methods, Intervention, & Analysis: A semi-structured online survey was emailed to BMT nurses. Response rate to the survey was 42% (n=15). The survey examined the definition of palliative care, role in BMT setting, optimal time of implementation and perceived impacts on patients and families. Examples of the coding scheme are illustrated in Figure 1.

Findings & Interpretation: Nurses aged from 18-54 years (Figure 2), majority (n=12, 80%) were bachelor prepared and had 1 to 15 years of experience. 96 responses were analyzed. Thirteen (87%) of nurses defined palliative care as comfort care. Approximately half (47%) identified palliative care as useful only at the end of life. The perception of the role of palliative care varied considerably. Examples include; managing pain control physical support, decreasing anxiety, mediator between teams, and increasing perceived family control. Providing end of life care as the most frequently identified role.

Discussion & Implications: This study illustrates the BMT nurses varying definition and perception of palliative care within pediatric BMT. The notion that palliative care can only be useful at end of life was compelling. Results from this study provide an opportunity to develop increased educational intervention and increase nursing knowledge surrounding palliative care. Additional research is needed to formulate a more accurate and consistent definition of palliative care and its role before, during and after transplant.

A Pilot Feasibility Study of Hypotensive Hematopoietic Malignancy Patients' USCOM Readings

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Topic Significance & Study Purpose/Background/Rationale: Patients with hematopoietic malignancies are at risk for cardiopulmonary toxicities secondary to high-dose chemotherapy, radiation, and sepsis.

Hemodynamic monitoring may offer insight into symptom recognition and management, but has not been studied in this population due to the invasive equipment available. Recently, noninvasive technology has become available, but conclusions about the inter-rater reliability of this cardiac output monitoring are mixed.

Methods, Intervention, & Analysis: Two independent USCOM users scanned patients to measure stroke volume (SV) and peak velocity (Vpk). Inter-rater reliability was assessed using the Intraclass Correlation Coefficient (ICC) for USCOM users scanning separate groups: (Aim 1) hemodynamically stable patients (patients with systolic blood pressures > 95mmHg and mean arterial pressures > 65mmHg) and (Aim 2) hypotensive patients (patients with systolic blood pressures < 95mmHg and mean arterial pressures < 65mmHg). Confidence intervals (CIs) were calculated for Aim 1 SV, Aim1 Vpk, Aim 2 SV, and Aim 2 Vpk.

Findings & Interpretation: For the hemodynamically stable group, the inter-rater reliability CI for Aim 1 SV (n=41) was 0.913 and for aim 1 Vpk (n=41) was 0.857. The hypotensive group inter-rater reliability CI for Aim 2 SV (n=40) was 0.978 and for Aim 2 Vpk (n=40) was 0.961.

Discussion & Implications: Two nurses taking USCOM readings of SV and Vpk can consistently achieve inter-rater agreement to establish the reliability of the USCOM in hemodynamically stable and hypotensive patients with hematopoietic malignancies. Insight into the cardiovascular function of this population will improve outcomes, decrease sequelae of overshooting fluid resuscitation, and encourage early intervention.

Assessment of Moral Distress in Nurses Working on an Inpatient Blood & Marrow Transplant Unit

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Topic Significance & Study Purpose/Background/Rationale: Moral distress is an emotion that occurs when internal or external constraints leads an employee to act in a way that is counter to their personal beliefs. Moral distress may lead to physical, psychological, social, and professional problems for nurses who are employed in a variety of care settings. Moral distress is often noted in nurses working in critical care units, however few studies have focused on other types of units. The purpose of this study was to illustrate moral distress in oncology nurses. The aims of this study were: to examine the level of moral distress in nurses who work on one inpatient Blood & Marrow Transplant Unit (BMTU); and to identify the factors that may lead to the highest level of moral distress in this population.

Methods, Intervention, & Analysis: This project was a cross-sectional design and included staff nurses working on the inpatient BMTU unit at a NCI designated CCC. The Moral Distress Scale - Revised (MDS-R) that was used to assess the intensity and frequency of moral distress. The investigators distributed a cover letter, the MDS-R, and a demographic form to all direct care staff nurses on the unit who worked at least 50% using REDCap software. Descriptive statistics were used to summarize the distribution demographics and the MDS-R scores.

Findings & Interpretation: The response rate was 29% (14/48). The mean MDS-R score for the participants was 104.43 and the range was 23 - 266. This is similar to the scores found for critical care nurses. The highest scores were found for three factors related to providing futile care which is also similar to the studies with critical care nurses.

Discussion & Implications: Some nurses change positions or even leave the profession of nursing as a result of moral distress. Moral distress also impacts the quality of care. Therefore, research on interventions to diminish moral distress is needed. A comprehensive plan that includes education and on-going support may be one way to decrease moral distress.

Toward a Better Understanding of Pediatric BMT Adherence: An Exploration of Provider Perceptions

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Topic Significance & Study Purpose/Background/Rationale: Pediatric bone marrow transplant (BMT) patients endure complicated treatment regimens, lifestyle modifications and a lifetime of long term follow up. Treatment adherence is a result of complex interactions between the patient, caregivers and providers, yet is rarely studied. This pilot study explored providers' perceptions of adherence.

Methods, Intervention, & Analysis: Thirteen physicians and 5 nurse practitioners (N = 18) were recruited from Nationwide Children's Hospital and the Pediatric Bone Marrow Transplant Consortium (PBMTTC). Participants completed an online semi-structured questionnaire about definition, assessment and perceived rates of adherence in pediatric BMT patients. Data was analyzed using a grounded theory approach. Emergent constructs were coded using descriptive and structural coding. Cohen's kappa for intercoder reliability was 0.72.

Findings & Interpretation: Researchers' extracted 187 statements from participants' responses. Figure 1 provides an example of the coding scheme. The majority (n = 12, 71%) of providers reported some aspect of adherence as their primary concern in outpatient BMT. Participants identified 10-30% of patients as non-adherent. Figure 2 illustrates providers' perceptions of adherence. No consistent definition of adherence was identified. Examples of reported observations of non-adherent patients are shown in Figure 3. Providers reported drug levels, self-report and refill records as the most frequent methods used to assess adherence. The major concern for all providers was the potential of non-adherence to negatively affect outcomes.

Discussion & Implications: This study contributes to a better understanding of providers' perceptions of adherence within pediatric BMT. Results from this study could provide an opportunity to develop interventions aimed at increasing provider communication with pediatric patients and their caregivers related to treatment adherence. Additional research is needed to describe, define and improve adherence in pediatric BMT to ultimately improve outcomes and quality of life for this vulnerable population.