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DO WE KNOW THE EDUCATIONAL NEEDS OF NURSES WORKING WITH PHYSICIANS WHO REFER PATIENTS TO TRANSPLANT CENTERS?

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Topic: The educational needs of nurses working with physicians referring patients for hematopoietic cell transplantation (HCT).

Purpose: Develop and conduct a survey of referring nurses to determine their educational needs and the most effective teaching methodologies to address these identified needs.

Interventions: Transplant Research and Education Initiatives in Nursing (TREIN) consists of five nurses from geographically distinct United States transplant centers whose goal is to develop and implement educational and research programs for the benefit of nurses and the patients they serve. TREIN is supported by an unrestricted educational grant from AnorMED. TREIN's first project is to develop an understanding of the educational needs of referring nurses. To date, we have developed and conducted a pilot survey. Each member of TREIN interviewed two referring nurses. Using the findings from this pilot survey, a questionnaire has been developed to be used in a comprehensive survey of referring nurses.

Findings: The pilot survey identified a number of factors that were considered in the development of the final questionnaire. One of our first challenges was identifying the referring nurse. While each transplant center has data on referring physicians, identifying the nurse or nurses in the practice was cumbersome. Communication between the HCT center and the referring practice was usually done between the HCT coordinator or physician directly to the referring physician. Referring nurses did not usually receive direct information from the HCT center although direct communication was desired. Nine of ten referring nurses interviewed identified learning needs. The most common learning need was for basic medical and nursing education regarding the HCT process.

Discussion: Referring nurses assume care for HCT recipients at many points across the treatment and recovery continuum and may have little to no formal education regarding HCT. It is our hope that by identifying not only the learning needs of referring nurses but also the most appropriate teaching methodologies, TREIN will be able to reach out to referring nurses to address these unmet educational needs. We believe that by establishing a closer relationship with referring nurses and assisting them with their transplant related educational needs, the care of HCT patients will be enhanced and a smoother transition of care for HCT patients before and after transplantation will be facilitated.

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HEMATOPOIETIC STEM CELL TRANSPLANT NURSING: COMPETENCY-BASED TRAINING

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Purpose

Stem cell transplantation (SCT) is a growing specialty in oncology and in immunotherapy. Although there is an extensive database on the medical aspects of SCT, there is a significant gap in the literature relating to clinical training guidelines for the orientation of new transplant nurses. Furthermore, inconsistencies were identified in the institution's current orientation program which focused considerably on technical skill training.

The development of a systematic, competency based orientation program will maximize the learning and teaching opportunities ensuring comprehensive cognitive and procedural skill training for the new SCT nurses. The researchers identified the need to develop self-directed learning modules and quizzes to develop nurses' clinical inquiry and problem solving skills. The need to improve the process for stem cell reinfusion skill training to ensure staff's technical competency was also identified. Lastly, outdated policies and competency checklists will be revised to reflect the new competency-based orientation training.

Interventions

A comprehensive literature search was conducted to establish the lack of literature related to competency-based training programs in stem cell transplant nursing. Benchmarking with comparable transplant centers in the country was conducted to establish industry best practices. A learning needs-assessment was conducted to establish areas in the SCT orientation process requiring improvements.

Evaluation

This project identified best practices in the orientation of a new SCT nurse and identified several phases:

I. Basic stem cell transplant didactic training
II. Intake process observation
III. Stem cell harvest observation
IV. Stem cell cryopreservation observation
V. Stem cell reinfusion training
VI. Self directed readings and learning modules
VII. Annual SCT nursing competency evaluation

This competency-based nursing orientation program will ensure clinical and cognitive core competencies to prepare new SCT nurses to effectively and safely care for the clinically complex and often critically ill SCT patients.

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ANALYSIS OF OUTCOMES FOR VASCATH INSERTION FOR PAEDIATRIC PERIPHERAL BLOOD STEM CELL COLLECTION: A QUEENSLAND EXPERIENCE

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Haematopoietic stem cell transplantation is now a standard procedure used for many paediatric oncology conditions. The stem cells can be collected from 3 different sources, bone marrow, cord blood and from peripheral blood.

Peripheral blood stem cells are harvested following stem cell mobilisation into the peripheral blood. Standard practice in adult units is to insert a large bore or 14Gauge peripheral cannula. However in children this is not practical, so another option is required. The use of standard central venous catheters (CVC) is not possible due to the large flow rate required which can collapse the standard CVC. It is the standard of practise at the Royal Children's Hospital to insert an apheresis catheter to the jugular or subclavian veins. This catheter is inserted and remains insitu until the peripheral blood stem cell collection is completed. There is little data published on the complications arising from this practice in paediatrics unless inserted in the femoral vein. This paper will discuss our institutional practice and current outcomes noted in relation to peripheral blood stem cell collections and the use of large rigid apheresis catheters.

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ESTABLISHMENT OF A LONG-TERM ALLOGENEIC BLOOD AND MARROW PROGRAM FOR EARLY DETECTION OF COMPLICATION AND MEASURING OUTCOMES

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Almost sixty percent of the 613 patients transplanted at our center last year received allogeneic blood or marrow transplantation. Allogeneic BMT complications are most prevalent in the first 100 days, but late infections and chronic graft versus host disease frequently occur after patients leave our comprehensive cancer center at day 100. Establishing a thorough, comprehensive and central computer accessible patient assessment will enable practitioners to phone triage problems with community healthcare providers and identify changes during follow-up visits for prevention, early detection of complication and prompt referrals.

At our center the patient's initial BMT physician remains involved in the care throughout the transplant process and follow-up. Referrals to our GVHD clinic occur as deemed appropriate by the clinic physician. Capture of the overall program incidence and

severity of complications like GVHD can be problematic. We have assigned one full-time Nurse Practitioner (NP) to follow the allogeneic patients from day 80-100 to the end of the first year after transplantation. The LTFU program NP coordinates care with the patient's clinic physician and Physician Assistant (PA). An extensive assessment is performed around the time the patient will be leaving the transplant center. Baseline data and outcome tracking will include incidence and severity of chronic graft vs. host disease, infections, endocrine and nutritional disorders, quality of life, and survival. Interesting trends have been noted and will be reported. Information about assessment tools and outcomes will be shared.

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BK VIRUS: A PROBLEM IN THE PEDIATRIC BONE MARROW TRANSPLANT PATIENT

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BK Virus is a polyomavirus that infects a large percentage of the human population; however, clinically significant infections develop almost exclusively in immunocompromised patients. BK Virus is one of the viruses that may be associated with hemorrhagic cystitis (HC) in bone marrow transplant (BMT) patients. Recently at The Children's Hospital in Denver there was concern that the incidence of BK virus might be increasing in our BMT population. Of the 307 patients transplanted from 1/94-8/06 (144 autologous and 163 allogeneic), 60 developed HC, nine of these 60 in the last year. BK virus was documented by urine PCR in 37; 6 had a documented negative; and 17 had no documented BK testing. Routine testing at our institution did not begin until 1999 and is only done if a patient develops clinical HC. Evaluation of our data currently does not support an increased incidence. It appears patients who are more severely immunocompromised, whether from their disease or treatment regimen, were at greater risk for being positive for BK virus-associated HC. An explanation of our increased numbers is we are treating greater number of patients who are more severely immunocompromised. In our population all patients with a positive BK were 4 years or older. Although sex does not appear to be a significant risk factor, it appears clinically boys had a higher morbidity than girls. Obstruction from clots that resulted in pain & urine retention was the main complications boys experienced. Treatment for BK virus is primarily related to symptom management & includes aggressive hydration, pain & bladder spasm treatment and transfusion support. Emotional support of patients and family is critical. Cidofivir has shown some efficacy in treatment of BK viruria. More severe cases have also received bladder irrigation, prostaglandin instillation &/or hyperbaric oxygen. Our institution is also exploring methods to prevent transmission of the virus such as isolation and improved hand washing techniques. Nursing management & support of patients and families is key to a successful outcome. This includes initiating a diagnostic/treatment plan at the first sign of HC, facilitating research studies, providing explanations of the drugs and procedures used to alleviate symptoms, monitoring labs and providing emotional support. Since there are many unanswered questions and no optimum treatment, we continue to need further research concerning prevention & management of BK virus-associated HC.

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IMPROVING YIELD FROM BLOOD CULTURES FOR TRANSPLANT PATIENTS

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Treatment and disease related factors place hematopoietic stem cell transplant (HSCT) patients at risk for life threatening infections. Multiple blood cultures are common in the attempt to identify a causative organism, guide antimicrobial coverage, and provide for optimum patient outcome. Historically there were inconsistencies in the number of sets that were drawn and the number of sites that were accessed for collecting the blood culture specimens. The goal of this project was to develop an evidenced-based protocol that would standardize practice for blood cultures and improve the clinical usefulness of results. Our performance improvement (PI) team worked with the transplant and infectious disease physicians to develop the protocol for drawing blood cultures. Staff were educated regarding the new policy and its rationale. Compliance with the protocol was monitored and variations in practice were addressed with individual staff members. Three months of data post protocol implementation (Time 2) were compared with historical data (Time 1). During T1, 96 patients had 314 culture events; during T2, 85 patients had 293 culture events. The average number of cultures per febrile patient during hospitalization in T1 was 4.5 sets, and each febrile patient was cultured an average of 3.2 days during the hospital stay. In T2, each febrile patient had an average of 7.4 culture sets drawn during the stay, and was cultured an average of 3.4 days. In T1, 37% of the time cultures were obtained from more than one site as compared to 89% in T2. Although the number of culture events did not change significantly, the protocol resulted in an increased number of positive cultures and infections identified in febrile patients. This project demonstrates how a nurse driven initiative can promote evidenced-based practice change that has the potential to improve patient outcomes.

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THE SAFETY AND EFFICACY OF PROPHYLACTIC VORICONAZOLE TO PREVENT FUNGAL INFECTIONS IN PEDIATRIC BLOOD AND MARROW TRANSPLANT PATIENTS

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Infection is one of the leading causes of morbidity and mortality in patients undergoing hematopoietic stem cell transplantation. Increased risk of infection is associated with prolonged neutropenia and delayed immune reconstitution which are common in recipients of unrelated donor cord blood or T-cell depleted adult grafts. In the past, invasive fungal infections were frequent and more difficult to treat. *Aspergillus* is commonly seen in immunocompromised patients and is challenging from a nursing care standpoint. Patients with pulmonary involvement are often febrile with increasing oxygen requirements in addition to having increased numbers of medication infusions. Historically, amphotericin B was used prophylactically to prevent fungal infections. New studies are testing whether voriconazole is superior to other antifungal agents for prevention and treatment of invasive fungal disease. By comparison, voriconazole has fewer side effects than amphotericin B, with less nephrotoxicity which is advantageous in the transplant setting with concomitant administration of cyclosporine or tacrolimus. The use of voriconazole has been associated with a decrease in the number of *Aspergillus* cases but a concomitant rise in less serious infections with azole-resistant candida species. The purpose of this abstract is to outline the nursing care associated with patients with invasive fungal disease. Specific goals will be to describe the clinical presentation of the patient with fungal disease as well as the treatment options and associated side effects.

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PROPHYLAXIS OF PNEUMOCYSTIS CARINII PNEUMONIA (PCP) WITH INHALED PENTAMIDINE IN PEDIATRIC PATIENTS UNDERGOING HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Pneumocystis carinii pneumonia (PCP) is a potentially life threatening opportunistic infection that occurs in immunosuppressed patients. The drug of choice for the treatment and prevention of this disease is trimethoprim-sulfamethoxazole (TMP) but alternatives are often needed because of adverse effects or treatment failure. Pentamidine is one alternative commonly used in patients undergoing hematopoietic stem cell transplantation because, unlike TMP, it is not myelosuppressive. Pentamidine has very low rate of absorption from the