

## CJON WRITING MENTORSHIP PROGRAM ARTICLE

# Hematopoietic Stem Cell Transplantation: Implications for Critical Care Nurses

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Hematopoietic stem cell transplantation (HSCT) is being used increasingly in the treatment of malignant and nonmalignant diseases. The treatment modality has been proven effective but is not without risks. Studies consistently have identified the need for advanced supportive care (e.g., multiple organ dysfunction, vasopressor use, mechanical ventilation) as a negative prognostic indicator in patients who have received HSCT. Among patients who have received HSCT, 15%–40% require critical care monitoring or advanced support. Nurses on intensive care units can positively impact outcomes for transplant recipients when they possess the specialized skills to recognize and promptly intervene when transplant-related complications arise. This article will provide a basic overview of the HSCT process and outline the complications that may necessitate transfer to a higher level of care for specialized skills and equipment in the intensive care setting.

The growth of hematopoietic stem cell transplantation (HSCT) programs in the United States has presented unique challenges to the nursing profession, which already is overly burdened. Issues such as an increased need for specialty education and training, integration of specialties, and inadequate staffing complicate the basic clinical concerns. The issues are directly related to increased patient acuity and complexity of treatment regimens. One of the challenges emerging in medical centers and institutions with smaller transplant programs is the provision of care for critically ill HSCT recipients by nononcology critical care nurses. Although many cancer centers take pride in the fact that every nurse on every unit is an oncology nurse, general intensive care units (ICUs) commonly receive and provide care for HSCT recipients in medical centers that are not dedicated to the care of patients with cancer. ICU nurses in nonspecialized hospitals may be experienced critical care nurses but have little or no knowledge of the specialized care needed by patients receiving HSCT. The aim of this article is to provide a basic overview of the HSCT process and to outline the complications that may necessitate transfer to a higher level of care and the specialized skills and equipment in the intensive care setting.

## Overview

The term HSCT is used increasingly by medical professionals to refer to the procedure previously known as bone marrow transplantation to be inclusive of the multiple sources of donor stem cells available for transplantation: bone marrow, peripheral blood, and cord blood. The traditional classification of HSCT is based on the relationship of the donor to the patient. Stem cells used in an autologous transplant are harvested from a patient's own marrow or peripheral blood, a syngeneic transplant uses stem cells from an identical twin, and an allogeneic transplant

### At a Glance

- ◆ Critical care monitoring or advanced support may be unavoidable for some patients receiving hematopoietic stem cell transplantation (HSCT).
- ◆ Care of critically ill patients undergoing HSCT presents a unique challenge to healthcare professionals.
- ◆ Early recognition and prompt intervention for HSCT-related complications can positively impact outcomes of care.

uses stem cells from a human leukocyte antigen- (HLA-) identical or closely matched sibling or an unrelated donor.

The list of indications for HSCT has been expanding gradually. The goal of HSCT for patients with malignancy is to rescue their marrow from the toxic effects of chemotherapy, with or without total body irradiation (TBI), permitting the administration of higher and potentially more curative doses of chemotherapy. In contrast, the goal of HSCT in patients with nonmalignant diseases is to replace nonfunctional or failed marrow (Kotloff, Ahya, & Crawford, 2004; Resnick, Shapira, & Slavin, 2005; Shaffer &

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