

# Nursing BMTCN

**ONCC Blood and Marrow Transplant Certified Nurse  
(BMTCN)**

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# Latest Version: 6.1

## Question: 1

A 60-year-old male patient received a transplant for acute myeloid leukemia 125 days ago. The nurse notes lichenification, itching, areas of hypopigmentation, and generalized redness of the patient's skin. The patient's clinical manifestations are most likely indicative of which one of the following posttransplant complications?

- A. Chronic graft-versus-host disease (cGVHD)
- B. Hepatomegaly
- C. Xerosis
- D. aGVHD

**Answer: A**

Explanation:

This patient is exhibiting integumentary-related chronic graft-versus-host disease (cGVHD) symptoms. Itching may indicate hepatic issues; however, the other symptoms in conjunction with the itching align most likely with cGVHD. Xerosis, or dry skin, may be present, but it is not the underlying issue. The presence of aGVHD occurs prior to day +100.

## Question: 2

The nurse is administering the scheduled 0900 medications to a 34-year-old female patient who remains an inpatient after receiving a hematopoietic stem cell transplant for chronic myeloid leukemia 99 days ago. The nurse notes slightly reddened scratch marks to her forearms and abdomen. The patient verbalizes increased tear production and intermittent headaches and states that her skin tone is "different." The patient's morning lab

values are as follows:

WBC 2.1

Hgb 11

Platelet count 36,000

BUN 16

Cr 0.9

ALT 38

AST 36

The nurse is suspicious of which one of the following late posttransplant complications?

- A. Acute kidney injury
- B. Hepatic GVHD
- C. Development of cataracts
- D. Pruritus

**Answer: B**

Explanation:

Hepatic GVHD typically presents very subtly at first manifesting with slight jaundice, pruritis, and mildly elevated liver function tests, as presented above. Acute kidney injury is not an anticipated late posttransplant complication, although this patient's renal function should be closely monitored. Although cataract formation may occur in the late posttransplant setting it is not clearly presented here. Although the nurse can deduce that the patient may be experiencing pruritus, other clinical information directs suspicion to hepatic complications, which often initially present with skin irritation.

### Question: 3

A patient's hemoglobin level has remained in the range of 6.0-7.5 in their every-12-hour complete blood count testing from day +11 to day +14. The nurse has been administering at least one unit of packed red blood cells each shift. Which one of the following medications would the nurse anticipate administering, related to an associated early posttransplant complication?

- A. Defibrotide
- B. Deferasirox
- C. Diflucan
- D. Doxycycline

**Answer: B**

Explanation:

The extent of this patient's transfusion dependency puts him at risk for iron overload, a common complication in the early posttransplant setting. Deferasirox is an iron-chelating agent, binding excessive iron stores to the stool for excretion via bowel movements. Defibrotide is a medication used to treat sinusoidal obstructive syndrome, a liver-related posttransplant complication. Diflucan is an antifungal, and doxycycline is an antibiotic—both of which are irrelevant in this scenario.

### Question: 4

Which one of the following stem cell donor types puts the recipient at the lowest risk of developing cGVHD?

- A. A 3/5 match umbilical cord donor via the donor registry
- B. A male donating to his father
- C. A male donating to his sister
- D. d. A female, para 1 gravida 1, donating to her brother

**Answer: C**

Explanation:

A male donating to his sister is representative of an allogeneic sibling transplant, which is the ideal donor type because siblings share the most DNA among the various donor types. Umbilical cord donors are a viable option, but the recipient typically will develop some degree of cGVHD. A son donating stem cells to his father represents a haploidentical donor type, which also will likely lead to cGVHD because they share a quarter of the same DNA. A female donor with a history of pregnancy will put the recipient at risk for cGVHD because the donor has been exposed to the fetus' DNA and thus has had exposure to other antibodies and antigens.

### Question: 5

A 46-year-old female patient who is 112 days posttransplant was previously treated with deferasirox, metoprolol, defibrotide, high-dose prednisone, dexamethasone, and topical corticosteroid creams. She continues to complain of severe pruritis and xerosis, and she notes new shiny striae scattered across her body. Which one of the following would be a beneficial intervention for this patient?

- A. Increased dosing of oral steroids
- B. Initiation of calcineurin inhibitors
- C. Increased dosing of granulocyte colony-stimulating factors
- D. Extracorporeal photopheresis

**Answer: D**

Explanation:

Extracorporeal photopheresis is a process in which WBCs are collected from the patient, treated and exposed to ultraviolet light, and returned to the patient intravenously. It is a treatment option for transplant recipients with cGVHD whose symptoms have not responded to aggressive steroid therapies. This patient was already receiving various high-dose oral steroids as well as steroid creams. Calcineurin inhibitors are used for the treatment of bronchiolitis obliterans, yet the patient is not exhibiting pulmonary complications. Increased dosage of a granulocyte colony-stimulating factor would not benefit this patient.

### Question: 6

Which one of the following patients would be an appropriate candidate for an autologous stem cell transplant?

- A. A 30-year-old female with newly diagnosed acute myeloid leukemia and a history of breast cancer
- B. A 28-year-old male with uncontrolled sickle cell anemia and extensive exchange blood transfusions
- C. A 51-year-old female with recurrent multiple myeloma and a history of renal failure
- D. A 2-year-old male with Hurler syndrome and a history of failure to thrive with a gastrostomy tube

**Answer: C**

Explanation:

Of the conditions presented, multiple myeloma is the only disease process that is eligible for an autologous stem cell transplant. Allogeneic stem cell transplants would be indicated for the remaining responses because the bone marrow itself has failed in the cases of acute myeloid leukemia and uncontrolled sickle cell anemia, and Hurler syndrome is an enzyme deficiency that would resurface should the patient receive their own cells in stem cell rescue.

### Question: 7

A 45-year-old male patient received a hematopoietic stem cell transplant for sickle cell anemia 9 days ago. He is complaining of mild chest pain, puffiness of his hands and feet, a slightly reddened rash to his trunk, and fatigue. His lab values are as follows: international normalized ratio 1.4, potassium 2.7, and direct bilirubin 0.3. This patient is exhibiting the signs and symptoms of which early posttransplant complication?

- A. Cytokine release syndrome
- B. Engraftment syndrome
- C. Tacrolimus toxicity
- D. Sepsis

**Answer: A**

Explanation:

Cytokine release syndrome is a common and often self-limiting complication in the posttransplant setting. It is a systemic inflammatory response that varies in severity and appears within the first 21 days posttransplant. Clinical manifestations are typically generalized and may include fever, chest pain, gastric upset, malaise, arrhythmias, and altered mental status. Laboratory findings include electrolyte imbalances, elevated D-dimer, prolonged prothrombin time, prolonged partial thromboplastin time, and hyperbilirubinemia. Engraftment syndrome may present with a rash, but other vital signs and different lab values are required to determine this complication. Tacrolimus toxicity is not a common early posttransplant complication and would present with hypertension and supratherapeutic tacrolimus levels. Sepsis may present in the early posttransplant setting, but it has different diagnostic criteria.

### Question: 8

A 61-year-old male patient with a history of two failed allogeneic stem cell transplants is admitted for extensive disease progression, altered mental status, and anemia

- a. His blood pressure is 102/60, heart rate 41, and respiration rate ranges between 7 and 10. His wife presses the nurse call light each time his heart rate decreases to less than 40 on continuous monitoring. The nurse is discussing anticipated changes in vital signs as the patient is nearing the end of his life. The nurse makes sure to maintain eye contact, displays an open

and inviting body posture, and pauses in between each sentence. The nurse is demonstrating which one of the following?

- A. Autonomy
- B. Empathy
- C. Therapeutic communication
- D. Active listening

**Answer: C**

Explanation:

Therapeutic communication is essential in providing effective patient care and is also essential when communicating with patients' families. Maintaining a calm demeanor while speaking, maintaining eye contact as culturally appropriate, showing empathy, and allowing short pauses between sentences are all aspects of therapeutic communication. Nurses exhibit autonomy by using their critical thinking skills and knowledge base to independently make clinical decisions and provide the highest quality of care to their patients. Showing empathy in the nursing profession provides a judgment-free space for patients to voice questions or concerns, while the nurse provides an understanding of the viewpoints of others. Active listening is an aspect of therapeutic communication that is not being demonstrated here.

### Question: 9

The nurse is performing her initial assessment at a shift change for a 41-year-old female patient who recently received a matched related donor hematopoietic stem cell transplant. The nurse notes that the patient is receiving meropenem, dexamethasone, famotidine, gabapentin, and hydromorphone via patient-controlled analgesia, for which there have been no demands on top of the continuous infusion within the past 3 hours. The patient is exhibiting slightly slurred speech and mild lethargy, and she states that she wishes the butterflies can get out of the window. Which one of the following interventions would be most appropriate for the nurse to advocate for?

- A. Administration of diphenhydramine
- B. An increased dosage of hydromorphone
- C. Initiation of a psychology consult
- D. A decreased dosage of hydromorphone

**Answer: D**

Explanation:

This patient is exhibiting symptoms of possible overdose of pain medication. No demands noted on the patient-controlled analgesia documentation coupled with hallucinations, slurred speech, and lethargy suggest that the continuous dosing of hydromorphone should be decreased. Diphenhydramine may exacerbate the patient's hallucinations and should be avoided. This patient's side effects are related to receiving too much pain medication, not altered mental status; therefore, a psychology consult is not appropriate.

## Question: 10

A patient is receiving high-dose cyclophosphamide as a preparative regimen for her upcoming matched unrelated donor hematopoietic stem cell transplant. Which one of the following clinical manifestations should the nurse immediately report to the physician team?

- A. SpO<sub>2</sub> value of 93% on room air
- B. Pink-tinged urine noted in the urine collection hat
- C. Patient complaining of a metallic taste in her mouth
- D. Voiding noted every 2 hours

**Answer: B**

Explanation:

Hemorrhagic cystitis is a noted complication of cyclophosphamide, both at standard and high dosing, because this chemotherapy is excreted through the urine. Scheduled administration of mesna every 6—8 hours protects the internal lining of the bladder from damage and the resultant hematuria. Any new onset of pink-tinged or red coloring to the urine should be immediately discussed with the physician team. An SpO<sub>2</sub> value of 93% on room air is sufficient as long as no respiratory distress is noted. A metallic taste during cyclophosphamide administration is a common side effect and can be combated with throat lozenges or ice pops. Patients are encouraged to void at least every 2 hours to prevent hemorrhagic cystitis.

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