

Transplantation Immunology

Developed and modified by

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Note to Students: The fundamental purpose of all activities in the health-care professions is to help other people. Like all behaviors, helping behavior becomes more effective and natural with practice. This workbook enables you to practice by helping your fellow students to learn basic science. Your skill at helping your fellow students should relate to your ability to help your patients in the future. This is a *Patient-Oriented Problem-Solving ("POPS")* workbook designed for four students. Before beginning this session, you should have (a) studied the objectives designed to prepare you for it, (b) taken the pretest, and (c) reviewed the topics listed at the end of the pretest.

Learning Objectives

1. List some of the diseases for which allogeneic hematopoietic stem cell transplantation (HSCT) or allogeneic bone marrow transplantation (ABMT) is used as a therapy.
 - A. Describe the sources of hematopoietic stem cells.
 - B. Describe how a stem cell donor is chosen.
2. Describe how the outcome (success, failure) of an HSCT is determined.
 - A. Define the goals of HSCT transplantation.
 - B. Describe how the corrective effect of an HSCT is determined.
3. Describe the immunological barriers that must be considered in doing an HSCT.
 - A. Describe host-versus-graft disease (HVGd) and graft-versus-host disease (GVHD).
 - B. Describe how an immune response can have a detrimental effect on the success of an HSCT.
 - C. Explain how the immune system of the graft recipient can be manipulated to prevent GVHD.
 - D. Explain how a graft-versus-leukemia reaction can be of benefit to the patient.
4. Describe the risks associated with HSCT.
 - A. Know the success rate of HSCT in curing a disease such as chronic myelogenous leukemia.
 - B. Describe the possibility of recurrent disease, infection, cancer, and GVHD and how these conditions may affect the success of the HSCT.
5. Describe the pathogenesis and clinical manifestations of GVHD.

Pretest

- Bone marrow failure is *unlikely* to be associated with:
 - Anemia
 - Increased susceptibility to infection
 - Leucocytopenia
 - Reticulocytosis
 - Thrombocytopenia
- Which one of the following is *inadequate* as a source of hematopoietic stem cells?
 - Blood
 - Bone marrow
 - Cord blood
 - Liver
- A 4-yr-old boy with refractory acute lymphocytic leukemia is considered for bone marrow transplantation. After screening his extended family (which included four brothers and a sister and twelve first cousins) and the national registry of bone marrow donors several potential donors are identified, as shown on the table. Which one of these possible donors is most likely to provide stem cells that would engraft with minimal risk of graft-versus-host disease?

		HLA-A	HLA-B	HLA-C	HLA-DR	HLA-DQ
	Patient	2	47	6	7	2
		3	27		4	8
A	Father	2	47	6	7	2
		3	62	3	11	5
B	Mother	1	8	7	17	2
		3	27	2	4	8
C	Brother	2	47	6	7	2
		3	27	2	4	8
D	Sister	2	47	6	7	2
		3	27	2	4	8
E	Male cousin	2	47	6	7	2
		3	27	2	4	8
F	Male unrelated donor	2	47	6	7	2
		3	27	2	4	8

- Hematopoietic stem cells are given to the recipient by infusing the cells into the patient's:
 - blood
 - bone marrow cavities
 - heart
 - peritoneal cavity

Pretest (ctd.)

5. Patients who have myelogenous leukemia are prepared for a hematopoietic stem cell transplant by:
 - A. chemotherapy and radiotherapy
 - B. laparoscopic surgery
 - C. splenectomy
 - D. thymectomy
 - E. none of the above

6. Which of the following is an unlikely complication of hematopoietic stem cell transplantation?
 - A. Failure of the graft to survive
 - B. Graft-versus-Host Disease (GVHD)
 - C. Infection
 - D. Malignant transformation of the transplanted stem cells
 - E. Treatment-associated malignancies

7. The cells infiltrating target tissues in chronic graft-versus-host disease are:
 - A. mixtures of mononuclear cells and granulocytes of donor origin
 - B. mixtures of mononuclear cells of donor and recipient origin
 - C. mixtures of mononuclear cells of donor origin and granulocytes of host origin
 - D. mononuclear cells of donor origin
 - E. mononuclear cells of host origin

8. Survival of a hematopoietic stem cell transplant and its establishment in the bone marrow may be determined by:
 - A. complete blood cell counts
 - B. evidence of chimerism
 - C. liver biopsy
 - D. lymph node biopsy
 - E. measuring creatinine clearance

9. In the weeks following hematopoietic stem cell transplantation most patients require:
 - A. folic acid megadoses
 - B. interleukin-2 therapy
 - C. psychotherapy
 - D. red blood cell transfusions
 - E. tetanus immunization

10. A significant risk associated with being a bone marrow donor is:
 - A. anemia
 - B. infection
 - C. leukemia
 - D. lymphadenopathy
 - E. thrombocytopenia