



# OHIO ASSOCIATION OF BLOOD BANKS



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## *From The OABB President*

Dear OABB members,

On behalf of the OABB Officers and Board members, I wish all of you a very Happy New Year!

Since its cold and snowy outside, I can't help looking forward to spring. The Board has been busy preparing for the 2009 OABB Annual Meeting to be held Thursday, April 30<sup>th</sup> at the Airport Concourse hotel in Columbus. The program has been finalized with four excellent speakers—two technical and two administrative topics.

Dr. Mary Ellen Wissel, Medical Director at the American Red Cross, Central Ohio Blood Services Region, will address "Emerging Diseases." Dr. Wissel will cover the epidemiology of emerging transfusion transmitted agents, discuss transfusion transmitted cases, and the methods available to promote patient safety.

"Cardiac OR: Blood Management" will be presented by Vincent Olshove, a Manager in the Cardiac OR at the Heart Center at Nationwide Children's Hospital. He will discuss the steps in cardio-pulmonary bypass, autologous

blood management strategies, and the criteria for blood product usage.

Beth Flynn, a Leadership Consultant and Trainer from the OSU Leadership Center will speak on "Generational Cultures." She will be speaking about the factors that contribute to the changing U.S. employment structure, the challenges employers will face due to the retirement of the baby boomer generation, and the generational work ethics differences.

Dr. Susan Sheehy is the Director of Educational Programs at Lean Healthcare West. In her presentation, "Lean Works" she will define Lean and its intended outcomes, identify tools that can be used, and discuss issues related to the Value Stream Map.

Be sure to mark your calendars for the April 30<sup>th</sup> Annual Meeting. It promises to be a great meeting and I am looking forward to seeing each of you!

Mary Schumacher  
OABB President

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## OABB Continuing Education Activity

### Hematopoietic Stem Cell (HSC) Transplantation (0.5 CH)

After reading this continuing education article, the participant shall be able to:

- ◆ Identify the three main sources of HSC for transplantation
- ◆ Select collection method associated with each HSC source
- ◆ Identify diseases in which transplant of autologous HSC is beneficial
- ◆ Specify the advantages and disadvantages of each source of HSC for allogeneic transplantation

#### **Definitions**

Hematopoietic stem cells (HSC): cells capable of differentiation into all blood cell lineages

Human leukocyte antigen (HLA): an immune system marker found on the surface of most nucleated cells of the body used to distinguish self from non-self

Graft-versus-host-disease (GVHD): a disease that results when immunocompetent cells mount an immune response against the recipient's tissue

Engraftment: following transplant of HSC, the return of the absolute neutrophil count to greater than 500/uL

#### **Sources of HSC for Transplantation**

Hematopoietic stem cells are an effective treatment to restore normal bone marrow function for a range of malignant, hematologic, immunologic, metabolic and neoplastic disorders. There are three main sources of hematopoietic stem cells for transplantation - bone marrow (BM), mobilized peripheral blood stem cells (PBSC), and umbilical cord blood (UCB)<sup>1</sup>. Bone marrow has been the traditional source of HSC for over 35 years for use in both autologous and allogeneic transplantation. There is extensive clinical data and information about BM outcomes and the donor experience. The use of PBSC beginning in the early 90's has replaced BM for most adult autologous transplants and a growing proportion of adult allogeneic transplants because of more rapid engraftment. UCB was found to be a source of HSC in the late 80's and is a more readily available source than BM and PBSC.

All three of these sources can be harvested from the patient (autologous transplant) and related or unrelated donors (an allogeneic transplant), or stem cells can be donated from UCB (autologous or allogeneic transplant). Although comparable outcomes have been achieved with all three sources, the transplant physician makes a selection based on individual factors related to the patient. The criteria include availability of the source (appropriately matched/suitable donor); patient disease state, clinical status, age; and the urgency of the patient's need for transplantation. In addition, important characteristics to consider when choosing a source include time to engraftment, the extent of the match between donor and recipient, the risk of graft-versus-host-disease (GVHD) and HSC dose<sup>1</sup>. Each source of HSC has specific advantages and disadvantages (refer to table 1).

#### **Collection Methods**

Bone marrow is obtained by multiple aspirations from the posterior or anterior iliac crest while the donor is under general anesthesia in an operating room setting. The donor will experience blood loss and mild to moderate pain but will recover within 2-4 weeks after the procedure. Once aspirated, the marrow is mixed with an anticoagulant such as adenine citrate dextrose and/or heparin. The marrow can then be given fresh to the recipient, manipulated, and/or cryopreserved for later use.

Apheresis is used to obtain PBSC. Hematopoietic stem cells circulate in very low concentrations in peripheral blood. In order to obtain sufficient numbers of HSC during the Apheresis collection process, the donor is treated with a stem cell-mobilizing agent such as granulocyte colony-stimulating factor (G-CSF) over a 3-6 day period prior to the collection<sup>2</sup>. These mobilizing agents enhance the production of leukocytes by the BM and release them into the peripheral circulation. This is a less invasive collection method than for bone marrow; however, it may take several days to collect an adequate HSC dose for transplantation.

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The process of collecting UCB is the least invasive/complex when compared to BM or PBSC. Cord blood is obtained immediately after an infant is delivered by needle aspiration from the placenta vein after the cord is clamped. The units are then processed and cryopreserved for storage either in private or public cord blood banks for future use.<sup>3</sup>

### **Autologous Transplantation**

Autologous transplantation is used as a rescue therapy by returning patient's own HSC following high-dose chemotherapy. The high-dose chemotherapy is used with the intention of eradicating the patient's malignant cell population at the cost of partial or complete bone marrow destruction<sup>2</sup>. The patient's previously collected stem cells from either their marrow or mobilized peripheral blood are then re-infused without risk of GVHD and very rarely graft rejection. Patients with multiple myeloma, autoimmune disorders or solid tumors such as medulloblastoma can benefit from autologous transplants. Patients with hematologic disorders such as leukemia are not candidates for autologous transplantation<sup>3</sup>.

### **Allogeneic Transplantation**

Allogeneic transplantation is used for a variety of malignant and non-malignant disorders such as acute myelocytic leukemia (AML), acute lymphocytic leukemia (ALL), non-Hodgkin's lymphoma, sickle cell anemia and aplastic anemia. Before allogeneic transplantation, careful human leukocyte antigen (HLA) matching of the donor and recipient is required. The degree of HLA matching is a key factor influencing transplant outcomes since well matched transplants have a decreased risk of potentially fatal complications such as graft rejection and GVHD<sup>3</sup>. Physicians may select PBSC based on their ability to engraft faster than BM and for higher HSC dose; however, PBSC is associated with a higher risk of GVHD than BM<sup>1,3</sup>. A shorter engraftment time is a higher priority due to a lower risk of acquiring an infection after transplant. Bone marrow and PBSC are primarily used in adult transplants, but PBSC are preferred in pediatric patients due to poorer outcomes with BM in children.

### **Transplantation with Umbilical Cord Blood**

Umbilical cord blood transplantation is an alternative source of HSC for allogeneic transplantation used primarily in pediatric patients. UCB has one major advantage over BM and PBSC; it does not need fully HLA matched for a successful transplant. However, a major disadvantage is the limited amount of HSC found in a single cord blood unit causing slower engraftment time and insufficient cell dose for adults<sup>1,2</sup>. Additional research is ongoing to explore the use of multiple cord blood units or to enhance cord blood HSC numbers in culture prior to transplant to achieve shorter time to engraftment<sup>3</sup>.

Table 1. Hematopoietic Cell Sources for Allogeneic Transplant

Characteristics	Bone Marrow (BM)	Peripheral Blood (PBSC)	Umbilical Cord Blood (UCB)
HLA matching requirements	Close matching required	Close matching required	Less restrictive matching than BM or PBSC
Engraftment time	Moderate	Shortest	Longest
Risk of GVHD	Higher	Highest	Lowest
HSC dose	Sufficient	Increased	Limited in adults

### **References**

National Marrow Donor Program. February 2009. Available from [www.nmdp.org](http://www.nmdp.org).  
 Rudmann SV. Blood Banking and Transfusion Medicine. 2<sup>nd</sup> ed. Philadelphia: Elsevier; 2005.  
 Powell JL, Gidwani P, Grupp SA, Kolb EA. Hematopoietic Stem Cell Transplantation. EMedicine. 2008, Oct 15. Available from [www.emedicine.medscape.com/article/991032-overview](http://www.emedicine.medscape.com/article/991032-overview).

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Answers will appear in the next issue of OABB Newsletter.

Prepared by Megan Pirman BA, MT (ASCP)

### Questions

1. The main sources of HSC for transplantation are:
  - a. BM, PBSC, amniotic fluid
  - b. BM, PBSC, UCB
  - c. BM, PBSC, liver
  - d. PBSC, UCB
2. When collecting PBSC, which collection method is most likely employed?
  - a. Aspiration from the sternum
  - b. Aspiration from the iliac crest
  - c. Apheresis after stimulating the donor with G-CSF
  - d. Collection from the placental vein
3. Autologous transplantation is the main treatment for which disease:
  - a. Multiple myeloma
  - b. Sickle cell anemia
  - c. Aplastic anemia
  - d. Acute lymphocytic leukemia (ALL)
4. PBSC is a good source of HSC for transplantation because:
  - a. Provides the shortest engraftment time
  - b. Non-invasive collection procedure
  - c. High number of HSC obtained
  - d. All of the above
5. UCB disadvantages include:
  - a. High HSC dose
  - b. Invasive collection procedure
  - c. Risk of GVHD is higher than BM or PBSC
  - d. Limited HSC dose

### **Answers to November CE Activity: 'Lows' -- What are They and Should We be Concerned? (0.5 CH)**

#### Questions

1. Performing the immediate-spin cross match allows detection of:
  - ◆ **ABO antibodies**
  - ◆ Clinically-significant antibodies to common antigens
  - ◆ Antibodies to low-incidence antigens not found on screening cells
  - ◆ Less elimination of less sensitive AHG methods
2. The prevalence of a low-incidence antigen is defined as equal to or less than:
  - ◆ **1%**
  - ◆ 3%
  - ◆ 5%
  - ◆ 7%
3. Detection of an antibody to a low-incidence antigen is most likely found when
  - ◆ the donor cells have a positive DAT
  - ◆ anti-A is eluted from cord cells
  - ◆ **antigen-negative units selected for the patient are incompatible**
  - ◆ the antibody screen is positive
4. The following are low-incidence antigens
  - ◆ C<sup>w</sup>, Kp<sup>b</sup>, Lu<sup>a</sup>
  - ◆ C<sup>w</sup>, Kp<sup>a</sup>, Lu<sup>b</sup>
  - ◆ **C<sup>w</sup>, Kp<sup>a</sup>, Lu<sup>a</sup>,**
  - ◆ V, Js<sup>a</sup>, Lu<sup>b</sup>
5. Selection of appropriate units for transfusion when a patient has an antibody to a low-incidence antigen is to:
  - ◆ request units from the blood supplier
  - ◆ **use the patient's reactive sample to screen units**
  - ◆ purchase the antisera from a vendor
  - ◆ request the physician to sign for incompatible units

### Membership Corner

Welcome to 2009. By now you have received your membership renewal invoices with several changes. One of the changes, I am sure you noticed, is membership dues increased for 2009. For the past several years at the OABB Annual Meeting, the Treasurer reported expenditures exceed revenue. To continue quality educational programs you have come to expect, the Board evaluated ways to increase revenue and decrease expenditures. Revenue sources are membership dues and program registration fees. Increasing membership dues appeared justified. For example, I have been a member of OABB for at least 15 years, and the individual membership dues are the same as when I originally joined. Economic times are difficult, but I hope you see the value of continued support of the organization with this increase.

You can help with revenue by promoting OABB membership to your colleagues. I became Membership Chair in 2004, and have disappointedly observed a steady decrease in yearly membership, except for 2008. In 2008, we posted our first increase, however the membership total is still less than in 2004.

Another change on the invoice is a statement encouraging you to provide your email address to receive the OABB Newsletter and membership renewals by email. This will reduce copying and mailing expenditures as well as being green.

The last change is a statement on the invoice indicating payment by Pay Pal and instructions for use. It was always possible to pay your dues on line with Pay Pal; however, it was not indicated on the invoice nor was it widely known.

I look forward to working with you this year to continue in the important goal of advancing our profession. If you have any questions, I am always available and happy to pass on anything to the Board regarding membership. I can be reached at [ccondrey@cbccts.org](mailto:ccondrey@cbccts.org).

**SUPPORT your PROFESSION. Renew your membership and encourage your colleagues to join OABB.**

Cyndi Condrey  
Membership Chair



#### WELCOME NEW MEMBERS!

**Pam Kotynski**  
TriHealth Hospitals, Inc.

**Robert Gutendorf**  
DNA Diagnostics Center

**Pamela English**  
Hoxworth Blood Center

**Margaret Simon**  
Hoxworth Blood Center

**Lead Medical Technologist (Ancillary Testing Coordinator / Blood Bank) Amended****SALARY RANGE:**

55,755.00 - 72,483.00 USD per year

**OPEN PERIOD:**Friday, November 14, 2008  
to Saturday, August 08, 2009**SERIES & GRADE:**

GS-0644-11/11

**POSITION INFORMATION:**

Full-Time Permanent

**DUTY LOCATIONS:**

1 vacancy - Columbus Metro area, OH

**WHO MAY BE CONSIDERED:**

Applications will be accepted from

**JOB SUMMARY:**

The incumbent is identified as the Lead Medical Technologist responsible for the quality of all the work and duties in the tissue bank and blood bank. The Technologist serves as resource person and technical advisor to clinicians, medical students and medical technologists on tissue bank, blood bank and coagulation procedures, interpretation of laboratory data, and the appropriate use of blood and blood/tissue products. The incumbent is an experienced Medical Technologist who serves as the Ancillary Testing Client Services Coordinator. Performs ancillary testing within the VAMC and its outreach functions or clinics. The incumbent serves as the technical advisor to all ancillary testing sites (Columbus VAACC sites, Zanesville CBOC, Newark CBOC, Marion CBOC, and Grove City CBOC)

**OABB Newsletter  
Submissions**

Letters, articles, and announcements of upcoming events may be submitted at any time.

Classified advertisements will be accepted from any member institution and printed at no charge.

## Education Opportunities February through May

**Cincinnati:** Hoxworth Blood Center's Master's in Transfusion and Transplantation Sciences lecture series continues. The lectures are open at no charge to those who are interested. If you would like to attend, please email or call Pam English at [pamela.english@uc.edu](mailto:pamela.english@uc.edu) or 513-558-1275. All lectures are held in the 4th floor classroom at Hoxworth Blood Center's Central donor center located at 3130 Highland Ave, Cincinnati, OH. Visit [www.hoxworth.org](http://www.hoxworth.org) for directions to the center.

**Cleveland:** The following continuing education is offered by American Red Cross, Northern Ohio Blood Services Region. For more information, contact Marlene D'Amico: [damicom@usa.redcross.org](mailto:damicom@usa.redcross.org)

Date	Topic
Feb 11	Serologic Case Studies
May 20	Transfusion Safety and Positive Patient ID at the Bedside

**Columbus:** The following continuing education is offered by American Red Cross, Central Ohio Blood Services Region. For more information, contact Deb Breech: [dbreech@usa.redcross.org](mailto:dbreech@usa.redcross.org)

Date	Topic
Mar 11	Red Cell Exchange vs. Red Cell Transfusion
Mar 24	TRALI Mitigation Strategies- The Donor Center Perspective
May 13	Agents Used to Reduce Blood Utilization
May 20	RFID in Blood Banking and Transfusion Services

**Dayton:** The following continuing education is offered by Community Blood Center/Community Tissue Services™. For more information, contact Laurie Carolus at 937-461-3580 or email [lc Carolus@cbcccts.org](mailto:lc Carolus@cbcccts.org)

Date	Topic
Feb 25	Donor Loyalty vs. Incentive Programs
Mar 25	TRALI: Platelet/Plasma Strategies for Blood Centers and Hospitals
Apr 1	Review of Donor Testing and Confirmatory Tests
Apr 29	Update on Allogeneic Hematopoietic Cell Transplantation – Cellular Therapy-focused
May 6	Turning Data into Knowledge
May 13	Agents Used to Reduce Blood Utilization
May 20	Transfusion Safety and Positive Patient ID at the Bedside