Stem Cell Transplant Protocol

A Transfusion Service Perspective

Jennifer Packard
Supervisor
Transfusion and Tissue Service

June 20, 2018

Objectives

1. Discuss the role of the transfusion service in the stem cell transplant process
2. Discuss pre-transplant testing requirements
3. Review product selection restrictions
4. Determine when a patient's blood type should be updated upon engraftment

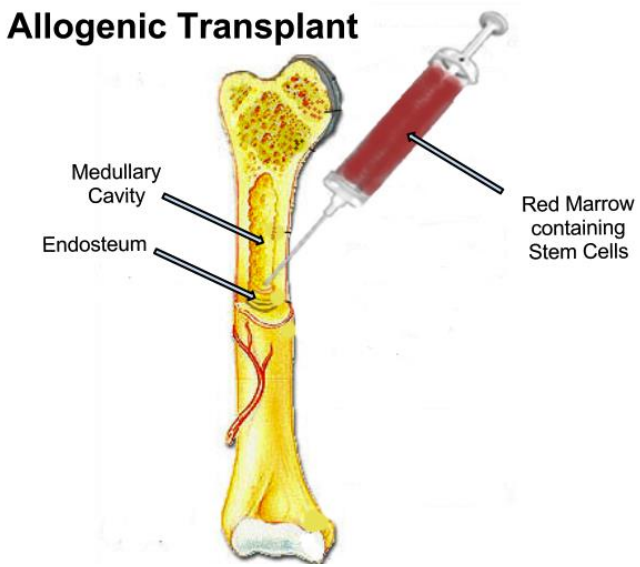
Stem Cell Transplants Today

A stem cell transplant is a treatment for some types of cancer:

- Leukemia
- Multiple Myeloma
- Lymphoma

A stem cell transplant can also be used to treat blood disorders:

- Sickle cell disease
- Thalassemia
- Aplastic anemia



Transfusion service roles

- Communication - with hospital stem cell department and stem cell processing laboratory
- Donor and recipient testing
- Blood product selection control and management
- Transfusion support

Pre-Transplant Testing

Testing for recipient:

- HLA type
- ABORh
- Antibody Screen
- Crossmatch with donor

Testing for potential donors:

- HLA type
- Infectious diseases
- ABORh
- Antibody Screen
- Crossmatch with recipient

Antibodies found in donor or recipient?

- 'Extra' processing of product
- Antigen type
- AHG crossmatch

Who will be my donor?

- Several donors may be tested in order to find the best match
- Samples submitted to transfusion service for testing

Challenges

- Samples may come from outside facilities (i.e. Germany) with inconsistent labeling
- Samples may not be kept at proper storage temperature during shipping and are unacceptable for testing
- Donor and recipient samples are not collected at the same time
- Finding the proper donor Medical Record number

We have a Match!

- Donor prepared and collected
- Patient prepared (chemo and/or radiation)
- Stem cells processed at collection facility
  - Red cell deplete marrow if antibody present in recipient or ABO incompatible with recipient
  - Plasma deplete for minor ABO incompatibility
- Transplant date determined

Day of Transplant

- Notification of Stem Cell Transplant received
  - Donor Name and ID
  - Recipient Name and ID
  - Date/Time of transplant
  - Donor ABORh
  - Recipient ABORh

This notice is being sent to inform you of an allogeneic stem cell transplant. To ensure the appropriate ABORh blood products are administered following transplantation, please update the recipient's blood bank records.

Blood Bank Responsibility

- Stem Cell Transplant transfusion requirement (protocol)
  - Irradiated cellular products
  - CMV negative → rare due to leukoreduced products
- Update patient's blood type to Changing Type if donor and recipient are not an EXACT match for ABO and Rh
- Make a comment in patient's chart indicating transplant information and donor and recipient blood type
  - Indicate appropriate type of RBCs, platelets, and plasma to give if Changing Type
- Sign and fax the form back to collection facility

Changing Blood Types

"My A Positive patient is getting a B Negative stem cell transplant!!?? Noooooooooooooo!"

Changing Type

- Patient should receive blood products that match both the recipient and donor blood types
  - O RBCs most frequently
  - A or AB platelets and plasma most frequently
- WHY?
  - Transfusions of ‘incompatible’ blood products may delay engraftment
    - ABO antibodies in platelets/plasma may cause hemolysis of remaining patient RBCs or newly emerging engrafted RBCs
    - Transfused RBCs may be hemolyzed by newly forming ABO isohemagglutinins

Management

Blood Product Management

Platelets are needed most often and always seem to be in short supply (apheresis only at Children's)

- Order as needed from blood supplier
- Request inventory from alternate site (Parkland)
- Ask the patient to wait for inventory arrival if possible
- Notify Medical Director to approve alternate platelet types when necessary

Selection/People Management

Changing Type requires an override – STOP & THINK

- Our computer system will allow you to select O Neg RBCs and AB Neg platelets without a warning
- All other types selected generate a warning and requires an override by the staff
- Overrides are reviewed by management

Compatibility Label Check

- A staff member checks the tagged product prior to issue and is responsible for making sure the correct type was selected

Engraftment

- Patient's may be hospitalized for several weeks getting frequent transfusions depending on the level of ablation and/or illness
- Recovery of patient's cells to 'normal' levels
  - Neutrophils – 14-20 days
  - Platelets – 8+ weeks
- ABORH
  - May see signs of engraftment as ABO isohemagglutinins fade and new RBCs are detected in forward

CAP TRM.40670

***REVISED** 08/21/2017*

TRM.40670 ABO Group and Rh(D) Type Verification Phase II

The recipient's ABO group and Rh(D) type has been verified by repeat testing of the same

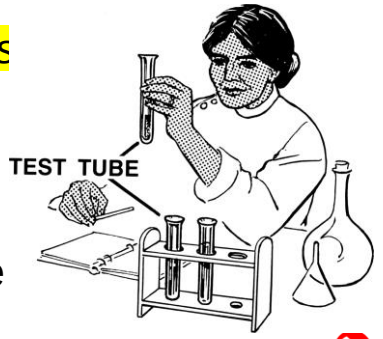
sample, a different sample, or agreement with a historical type in the laboratory's records.

NOTE: Repeat testing of the same sample may be inadequate unless the sample has been drawn using a mechanical barrier system or digital bedside patient identification system. For laboratories that employ computer crossmatching, serologic crossmatch techniques must be employed when ABO typing discrepancies are present (e.g. mixed field reactivity, missing serum reactivity, apparent change in blood type post hematopoietic stem cell trans

Evidence of Compliance:

✓ Written procedure defining method for verification of ABO **AND**

✓ Work records of test results and/or search of records verifying ABO type



children'shealth

Updating Blood Type

- Children's policy:
  - When forward and reverse agree with no mixed field
  - Red cell transfusion free for at least 6 months

- Chimera – a person composed of two genetically distinct types of cells
  - May appear to be Changing Type forever
  - Transfusion needs should not continue throughout life

Instruments and Interfaces

- Ortho Vision does not support non-standard blood types
- HCLL does not allow you to edit results or interpretations sent from an interfaced instrument

- Solution → Print results from instrument and manually enter them into LIS instead of using interface
  - Risk for data entry errors

ABOi Heart Transplants

- Patients under 2 years
- AB plasma products only prior to transplant
- Update to Changing Type on transplant date if the donor is not compatible with the patient
- Keep ABO titers low - monitor daily at first and then weekly
- Give RBCs and plasma that are compatible with both donor and recipient for 12 months post transplant

FOUR ABO INCOMPATIBLE HEART TRANSPLANTS

PERFORMED AT CHILDREN'S IN THE PAST YEAR

bethematch.org - JOIN

BE THE MATCH® **Online Registration**

Join the marrow registry

Joining the registry is the first step to become a marrow donor. We will ask you a series of questions which include a brief medical history and contact information. The process should take around 10 minutes.

New user?

Please set up your account login and password.

Join Now

Active military? Register through the Department of Defense

Already started?

If you're returning to complete your registration, log in to your account to continue.

Log In

Have questions about joining the registry or marrow donation?

Medical guidelines for joining the registry
FAQ about joining the registry
How marrow donation works

children'shealth®

QUESTIONS?