

ABO Incompatible Heart Transplant Protocol

Purpose

To provide blood and blood products compatible with the ABO incompatible heart transplant patient and donor. To evaluate circulating ABO antibody present in patients receiving incompatible heart transplants

Policy Statements

Special transfusion requirements are needed to accommodate an ABO-mismatched heart transplant, and these requirements must be a part of a patient's permanent record.

Procedure

Perform these steps when a patient becomes an ABO incompatible heart transplant candidate:

Patient becomes an ABO incompatible heart transplant candidate

| Step | Action |
|------|--|
| 1 | Receive a call from heart transplant team that patient is on the transplant list. Note: If an ABO isohemagglutinin titer order is received on a heart patient, contact the ordering provider to confirm patient is on transplant list. |
| 2 | Enter patient's blood requirements in the Blood Bank Administrative Data (BAD) file: <ul style="list-style-type: none"> RBCs should be either O for patients <4 months or recipient's blood type Plasma products should be compatible both the patient and the organ. |
| 3 | Perform ABO titers when ordered on the patient. |

Enter Donor type and product requirements in patient's BAD file for transfusion after surgery:

Notification of Donor Type

Providing blood and blood products during and after surgery

| Step | Action |
|------|---|
| 1 | Transplant team will call Transfusion Service with ABO type of donor heart. |
| 2 | Request fax of the donor type to be sent to Transfusion Service if one has not already been received. |
| 3 | Upon receipt of faxed confirmation and once the surgery has started, enter donor ABO type, date of transplant and instruction for selection of product ABO types for transfusion during surgery and post transplant in the BAD file under the comments field. <ul style="list-style-type: none"> Enter Code ABOHT (ABO Incompatible Heart Transplant, ABO Restrictions on Plasma Products-See Procedure TS 3.30) to the patient's Antigen/Antibody field Enter Donor Blood Type Code to the Problem Field. Add Unit Tag Comment ABORP-"ABO Restriction on Plasma Products, ABO Incomp. Heart Transplant" to all plasma products of ABO incompatible transplant recipients. QA Reason Code INHT-"ABO Incompatible Heart Transplant" should be used to answer QA failures for "Patient/Unit/AG/AB incompatibility" |

Provide blood products for patients during and after surgery according to these requirements:

| Patient's Group | Donor's Group | RBCs | FFP | Cryo | Platelets |
|-----------------|---------------|------|-------|--|-----------|
| O | A | O | A, AB | A,AB | A,AB |
| O | B | O | B, AB | B, AB | B,AB |
| O | AB | O | AB | AB | AB |
| A | B | O, A | AB | AB (A cryo can be used if approved by Medical director) | AB |
| A | AB | O,A | AB | | AB |
| B | A | O,B | AB | | AB |
| B | AB | O, B | AB | | AB |
| B | AB | O, B | AB | | AB |

ABO titers are performed and results communicated appropriately for ABO incompatible heart transplant patients according to these requirements:

Note: ABO titers are performed to determine if there is circulating antibody that may be incompatible with the transplanted heart.

ABO Titers

| Step | Action | | | | | | |
|------------------------|--|------------------------|------|----------|---|----------|--|
| 1 | If a sample is received for an ABO titer, perform an immediate spin (IS) back type. | | | | | | |
| 2 | Evaluate the results of the back type. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">If the IS back type is</th> <th style="width: 50%;">Then</th> </tr> </thead> <tbody> <tr> <td>Negative</td> <td> <ul style="list-style-type: none"> If the patient is in surgery, call negative result of back type to surgery. Continue incubating for 15 minutes at room temperature, centrifuge, read, and record results. If patient is in surgery, call the 15 minute RT incubation result to surgery. If the 15 minute RT incubation back type is negative, then a titer does not need to be performed and procedure is complete. Proceed to Step 6. If the 15 minute RT incubation back type is positive, then the titer does need to be performed. Proceed to Step 3. </td> </tr> <tr> <td>Positive</td> <td> <ul style="list-style-type: none"> If patient is in surgery call positive result of back type to surgery. Proceed to Step 3 and perform the titer. </td> </tr> </tbody> </table> | If the IS back type is | Then | Negative | <ul style="list-style-type: none"> If the patient is in surgery, call negative result of back type to surgery. Continue incubating for 15 minutes at room temperature, centrifuge, read, and record results. If patient is in surgery, call the 15 minute RT incubation result to surgery. If the 15 minute RT incubation back type is negative, then a titer does not need to be performed and procedure is complete. Proceed to Step 6. If the 15 minute RT incubation back type is positive, then the titer does need to be performed. Proceed to Step 3. | Positive | <ul style="list-style-type: none"> If patient is in surgery call positive result of back type to surgery. Proceed to Step 3 and perform the titer. |
| If the IS back type is | Then | | | | | | |
| Negative | <ul style="list-style-type: none"> If the patient is in surgery, call negative result of back type to surgery. Continue incubating for 15 minutes at room temperature, centrifuge, read, and record results. If patient is in surgery, call the 15 minute RT incubation result to surgery. If the 15 minute RT incubation back type is negative, then a titer does not need to be performed and procedure is complete. Proceed to Step 6. If the 15 minute RT incubation back type is positive, then the titer does need to be performed. Proceed to Step 3. | | | | | | |
| Positive | <ul style="list-style-type: none"> If patient is in surgery call positive result of back type to surgery. Proceed to Step 3 and perform the titer. | | | | | | |
| 3 | Prepare ABTI titer following TS 4.28 Isohemagglutination titer | | | | | | |
| 4 | Read at IS and after 15 minute RT incubation, record results | | | | | | |
| 5 | <ul style="list-style-type: none"> Interpret the titer as the last 15 minute RT incubation titer that has a 1+ reaction. If patient is in surgery call the 15 minute RT incubation titer result to surgery. | | | | | | |

| | |
|---|-------------------------------|
| 6 | Record results into Sunquest. |
|---|-------------------------------|

References

1. Foreman C, Gruenwald C, and West L. "ABO-incompatible heart transplantation: a perfusion strategy" *Perfusion*, 204 19(1):69-72
2. West LJ, Pollock-Barziv SM, et. al. "ABO-Incompatible Heart Transplantation in Infants". *New England Journal of Medicine*, 2001 344(11): 793-800

Appendices

- A. Blood Component Selection
- B. Heart Transplant Codes

Approval Workflow

Transfusion Service/Laboratory Director

Historical Record

| Version | Written/Revised by: | Effective Date: | Summary of Revisions |
|---------|---------------------|-----------------|---|
| 1 | S. Cassidy | 09/01/2018 | Initial Version |
| 2 | S. Cassidy | 10/22/18 | Added Heart Transplant Codes for computer |

Appendix A

Blood Component Selection

General Rules

- **RBC ABO Type:** match recipient blood type.
- **Plasma/Platelets ABO Type:** match donor blood type

Provide the following blood products unless determined otherwise by the Transfusion Medicine Medical Director:

Note: if patient \leq 4 months transfuse O RBCs and donor matching plasma/platelets

| Patient's Type | Donor Organ's Type | RBCs | Plasma | Cryo | Platelets |
|----------------|--------------------|------|---------|--|-----------|
| O | A | O | A or AB | A or AB | A or AB |
| O | B | O | B or AB | B or AB | B or AB |
| O | AB | O | AB | AB | AB |
| A | B | A | AB | AB (A cryo can be used if approved by Medical director) | AB |
| A | AB | A | AB | | AB |
| B | A | B | AB | | AB |
| B | AB | B | AB | | AB |

Appendix B

Heart Transplant Codes

| Donor Blood Type Codes | |
|-------------------------------|---------------|
| HTOP | O Pos |
| HTON | O Neg |
| HTAP | A Pos |
| HTAN | A Neg |
| HTBP | B Pos |
| HTBN | B Neg |
| HTABP | AB Pos |
| HTABN | AB Neg |

| Antigen/Antibody Code | |
|--------------------------------|---|
| ABOHT | ABO Incompatible Heart Transplant, ABO Restrictions on Plasma Products-See Procedure TS 3.30 |
| Reason Codes BOP or BPI | |
| INHT | ABO Incompatible Heart Transplant |
| Unit Tag Comment | |
| ABORP | ABO Restriction on Plasma Products, ABO Incomp. Heart Transplant |