

ECMO Orders

Purpose

This process describes how to provide specific blood product requirements for patients undergoing extracorporeal membrane oxygenation (ECMO).

Policy Statements

- A minimum of 4-Mpls (2 STP) O Neg Leukocyte Reduced RBC (additive solution) units \leq 7 days will be maintained on “Reserve” in inventory at all times for emergency ECMO initiation.
- Leukocyte Reduced red cells (AS-1/AS-3) used for ECMO prime or re-prime must be no more than 7 days old.
- Spin and remove additive solution just prior to issue on red cells units used for initial ECMO prime.
- One < 7 day old, O Neg Leukocyte Reduced CPDA-1 will be on reserve for emergency release for patients on ECMO.
- Irradiated red cells and platelets for all infants less than 4 months old throughout that admission period. (Red cells irradiate just prior to issue.)
- Leukocyte reduced red cells for infants less than 4 months old must lack Hgb S while the infant is on ECMO.

Definitions

RBC (additive solution)-red blood cells with additive solution of AS-1, AS-3, or AS-5.
 SDP-Single Donor Platelets (apheresis platelet, pheresed platelet)

Related Documents

[TSja 03.15.1 ECMO Transfusion Protocol](#)

Process

Initiation of ECMO

Activity		Key Considerations		Related Document
1	Spin fresh RBCs that are \leq 7 days old	If	Then	
		Patient is < 4 months old	Spin two units group O Neg	
		Patient \geq 4 months old and blood type <u>has not</u> been determined on a current sample	Spin the two units group O Neg **See below for switching to group specific RBCs	
		Patient \geq 4 months old and blood type <u>has</u> been determined on a <u>current</u> sample	Spin 2 group specific/Rh compatible red cells units.	
<ul style="list-style-type: none"> • Spin additional fresh units per physician or ECMO Coordinator's order. • Leukocyte Reduced CPDA-1 may be used in an emergency if time does not allow the spinning and removal of additive solution. • Notify the physician and transfusion medicine specialist on call if units < 7 days old are not available. 				
2	Remove additive solution			TS 10.20 Removing Additive Solution
3	Irradiate red cell units as needed	All infants < 4 months old or per provider's orders.		

4	Test RBCs for Hgb S	Infants < 4 months old or per provider's orders.	TS 7.16 Sickle (Hgb S) Testing Red Cell Products							
5	Allocate and tag units for issue.	Follow Emergency Release Process if issue of units requested prior to completion of required pre-transfusion testing.	TS 12.1 Allocating of Red Cell Products Under a UXM-SQ TS 4.20 Compatibility Testing-Electronic Crossmatch TS 13.3 Allocating and Issuing of Blood Products for Emergency Release							
6	Assess platelet inventory.	<table border="1"> <thead> <tr> <th>If</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>Full ABO compatible SDP available.</td> <td>Place label on plt rotator to reserve unit for patient.</td> </tr> <tr> <td>Platelets not available.</td> <td>Order unit STAT from blood center.</td> </tr> </tbody> </table>		If	Then	Full ABO compatible SDP available.	Place label on plt rotator to reserve unit for patient.	Platelets not available.	Order unit STAT from blood center.	TS 7.3 Ordering Blood Products-MBC TS 7.4 Ordering Blood Products-ARC
		If	Then							
		Full ABO compatible SDP available.	Place label on plt rotator to reserve unit for patient.							
Platelets not available.	Order unit STAT from blood center.									
7	Thaw and allocate FFP and cryoprecipitate per orders.	TS 3.13 Plasma Orders TS 3.14 Cryoprecipitate Orders								
8	Prepare and allocate platelets per orders.	TS 3.8 Platelet Orders								
9	Assess inventory and place order with blood center as needed.	<ul style="list-style-type: none"> Replace the 2 "Reserve" ≤ 7 day old O Neg RBC units. Order fresh < 7 day RBC as needed for standby prime: <ol style="list-style-type: none"> Infants < 4 months old: 2 group O, Rh compatible RBCs. Patient's > 4 months old: 2-4 ABO/Rh compatible RBCs. Patient > 25Kg order 4 units. Order SDP platelets as need to maintain a minimum of 1 transfusion dose on standby. 	TS 7.3 Ordering Blood Products-MBC TS 7.4 Ordering Blood Products-ARC							
10	Issue products in cooler or pneumatic tube as requested.		TS 12.5 Issue of Products							
11	Prepare RBC products for standing orders.									
12	Post ECMO case on BB Refrig		TSf 3.15.1 NECMO TSf 3.15.2 PECMO							

****Note: Switching patients from group O Red Cells to group specific (A, B, AB)**

If	Then
Patients 4- 12 months	Crossmatch one unit of group specific red cells by IS tube technique using a fresh, post-transfusion specimen. <ul style="list-style-type: none"> If compatible, group specific units may be issued following standard crossmatch protocol. TS 3.4 Crossmatch-RBC Orders for Patients over 4 months If incompatible, continue to issue group O red cells
Patients > 1 year old	Switch to group specific once the recipient's ABO/Rh has been determined on a current specimen

Standing orders while patient is on ECMO up to 12 hours post-decannulation.

Infant < 4 months old	RBCs criteria for re-prime or massive blood loss.	RBCs criteria for routine transfusion.
	2 units RBCs (additive solution) <ul style="list-style-type: none"> Group O, Rh compatible ≤ 7 day old Hgb S negative Pre-spin units ^{see a} Remove additive just prior to issue Irradiate just prior to issue 	Select a fresh CPDA-1 RBC <ul style="list-style-type: none"> Group O, Rh compatible Continue to use from unit regardless of age Hgb S negative Irradiate aliquots just prior to issue
Patient > 4 months old	RBCs criteria for re-prime or massive blood loss.	RBCs criteria for routine transfusion.
	2-4 units RBCs (additive solution) (Number of units to be determined by ECMO coordinator) <ul style="list-style-type: none"> Group specific/Rh compatible. ^{see b} Crossmatch compatible ≤7 days old Pre-spin units ^{see a} Remove additive just prior to issue Irradiate prior to issue per provider order 	1 to 2 units RBCs (additive solution) <ul style="list-style-type: none"> Group specific/Rh compatible ^{see b} Crossmatch compatible No unit age requirements unless specified by ECMO coordinator Pre-spin units ^{see a} Remove additive just prior to issue Irradiate prior to issue per provider order
	<p>a. Additive red cell units may sit spun for up to 5 days. After 5 days, resuspend units. Do NOT re-spin the same unit. Designate spun units as Prime or Routine transfusion. TSja 03.0.2 Priming Unit Tag TSja 03.0.4 Routine Transfusion Tag</p> <p>b. If the group O red cells were used for the initial prime, the patient may be switched to group specific (e.g. A, B, or AB) red cells immediately if patient > 1 year old. If recipient is 4-12 month old, then group specific (E.g. A, B, or AB) red cells must be crossmatched through IS with a new post-group O transfusion specimen.</p>	
Platelets	1-1/2 Group specific SDP <ul style="list-style-type: none"> Patients < 4 months: pre-irradiated Patients > 4 months; Pre-irradiate per physician order 	

Approval Workflow

Transfusion Service/Medical Director

Historical Record

Version	Written/Revised by:	Effective Date:	Summary of Revisions
1	J Wenzel	3/11/1998	Initial Version
2	J Wenzel	11/2000	Reserved O Neg RBC
3	J Wenzel	6/28/2002	Hgb S requirements
4	J Wenzel	5/16/2003	
5	J Wenzel	12/17/2009	Online format
6	J Wenzel	4/10/2012	Link to jobaid vs appendix Added information to switch to type specific.
7	S Cassidy	11/06/15	Change ≤ 5 days to ≤7 days

