

Therapeutic Plasma Exchange for the ABO Incompatible Liver Transplant Patient

Version: 3

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This clinical practice guideline is departmental specific and applies only to activities within the Nephrology and Transplant programs.

1.0 Introduction

This Clinical Practice Guideline (CPG) refers to the therapeutic plasma exchange for a patient with an ABO Incompatible Liver Transplant. The number of plasma exchanges is patient specific and is ordered by the physician responsible for the patient's care.

Target users

- Nurses, Physicians within the Nephrology and Transplant programs.
- **Indications:** CPG applies to patients with an ABO Incompatible Liver Transplant
- **Contraindications:** Plasma exchanges should not be performed within 24 hrs of an operative procedure. If necessary to bypass this recommendation, the Staff M.D **must document** the need for the treatment in the patient chart.

ACE inhibitors should be held for ≥ 24 hours prior to plasma exchanges. Longer-acting drugs of this class, including enalapril and lisinopril, should be withheld ≥ 72 hours.

2.0 Definitions

- **Total Blood Volume (TBV)** - the amount of blood in the whole body, both cells and fluid. The volume of the patient's blood is based on the patient's weight. The TBV is related to lean body mass. There is a difference between children and adults with newborns having a higher TBV per kg because of their higher packed red cell volume. TBV is calculated using the following formula:

- Neonates (0-1 month)	100 ml/kg
- Infants/children (1month -<16 years)	80 ml/kg
- Adolescents (≥ 16 yrs)	70 ml/kg

- **Plasma Volume** - the total volume of plasma in the body.

Plasma Volume = Total Blood Volume X (1-hematocrit).

- **Exchange** - patient plasma is replaced by donor plasma. The exchange product can be either Octaplasma, 5% Albumin or a combination of both.

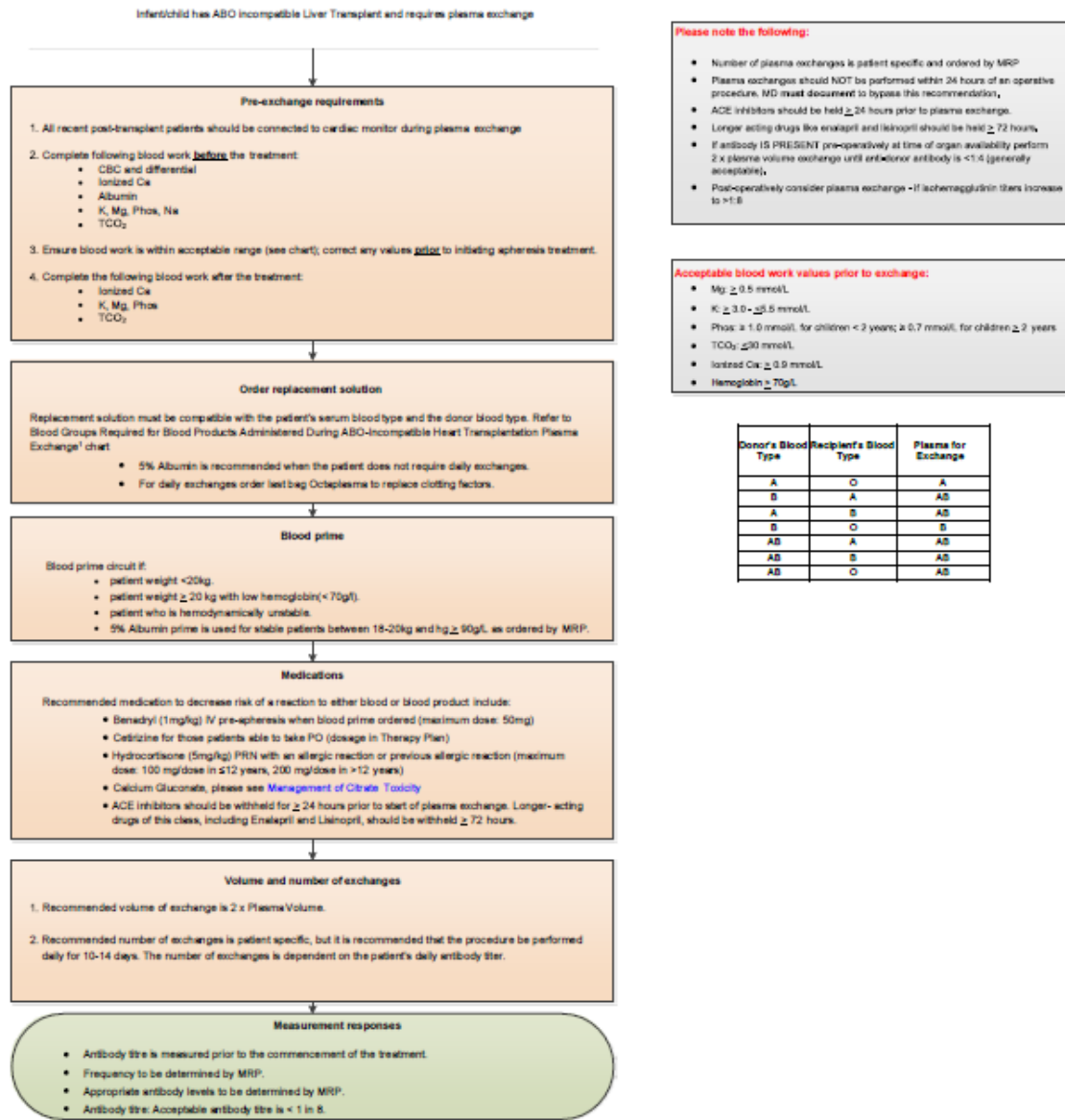
3.0 Clinical Guideline

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- If antibody IS PRESENT pre-operatively at time of organ availability perform double-volume plasmapheresis until anti-donor antibody is no longer detected ($\leq 1:4$ generally acceptable).
- Post-operatively consider plasmapheresis - if isohemagglutinin titers increase to $\geq 1:8$

Liver Transplant ABO Incompatible Therapeutic Plasma Exchange






4.0 Implementation of CPG:

Measurement of Responses

- Antibody titre is measured prior to the commencement of the treatment and at a frequency to be determined by the Most Responsible Physician (MRP). Appropriate antibody levels to be determined by the MRP.
- Antibody titre: Acceptable antibody titre is ≤ 1 in 8.

5.0 Related Documents:

- [Therapeutic Plasma Exchange Procedure ==>](#) 
- [Management of Citrate Toxicity ==>](#) 
- [Blood Component Infusions ==>](#) 
- [Therapeutic plasma exchange for ABO incompatible transplant](#)

6.0 References

1. ABO Liver Transplant Protocol from Cincinnati Children's Hospital Medical Centre
2. Hanto, D. W., Fecteau, A. H., Alonso, M. H., Valente, J. F., and Whiting, J. F., (2003). ABO-Incompatible liver transplantation with no immunological graft losses using total plasma exchange, splenectomy and quadruple immunosuppression; Evidence for Accommodation. **Liver Transplantation**. 9 (1), 22-30.
3. Morioka, D., Sekido, H., Kubota, K., Sugita, M., Tanaka, K., Togo, S., Yaamanaka, S., Sasaki, T., Inayama, Y., and Shimada, H. (2004). Antibody-mediated rejection after adult ABO-Incompatible liver transplantation. Remedied by gamma-globulin infusion combined with plasmapheresis. **Transplantation**. 78 (8), 1225-1228.
4. McLeod, B C **Apheresis: Principles and Practice**. 1997 (409-415)
5. The Hospital for Sick Children: Liver Transplant Program Protocols/Guidelines (2015)
6. Weinstein Robert, Hypocalcemic Toxicity and Atypical Reactions in Therapeutic Plasma Exchange: Journal of Clinical Apheresis 16:210-211(2001).
7. West LJ, Pollick-Barziv SM, Dipchand AI, Lee KJ, Cardella CJ, Benson LN, Redeyka IM, Coles JG. (2001) ABO-incompatible heart transplant in infants. **New England Journal of Medicine**. 344 (11), 793-800.

Attachments:

[Liver Transplant care pathway](#)