DukeMedicine

Division of Cellular Therapy

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Guidelines for Calcium Administration

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ABMT-COLL-012
GUIDELINES FOR CALCIUM ADMINISTRATION

1 PURPOSE

1.1 To describe the guidelines for calcium administration during apheresis and photopheresis for the treatment of citrate toxicity.

2 INTRODUCTION

2.1 Recognition and treatment of the early signs and symptoms of citrate toxicity prevents progression of symptoms and maintains patient comfort.

3 SCOPE AND RESPONSIBILITIES

3.1 The apheresis and/or photopheresis nurse is responsible for educating the patient about citrate toxicity and treating symptoms. See APBMT-COMM-*035 Detection & Management of Adverse Events* for more information about toxicities associated with apheresis and photopheresis.

3.2 The apheresis and/or photopheresis nurse will consult with the attending physician and obtain orders for treatment with calcium.

4 DEFINITONS/ACRONYMS

4.1 KVO: Keep vein open

4.2 PO: By mouth

4.3 mL: milliliter

4.4 IV: intravenous

5 MATERIALS

5.1 IV tubing

5.2 IV filter

5.3 0.22 micron filter

6 EQUIPMENT

6.1 Alaris IV pump

7 SAFETY

7.1 NA

8 PROCEDURE

8.1 **Mild Symptoms:** Sensitivity to citrate and the resulting symptoms vary greatly among patients. When a slow whole blood flow rate (example: 25mL/min) is

maintained during apheresis and/or photopheresis, citrate reactions will be infrequent. If a patient complains of mild symptoms of citrate toxicity such as numbness or tingling in the hands or face, a feeling of vibration or buzzing, a ringing in the ears, hand cramping, or mild paresthesia and the symptoms do not progress and are tolerated by the patient, no treatment is required. The patient must be encouraged to report any progression in symptoms so that treatment can be given.

Since the whole blood flow rate should not be lowered below 25 mL/min, and the ratio of whole blood to citrate cannot be changed on the Optia and the Cellex cell separator without a chance of clotting, the procedure can be temporarily paused and saline can be given at a KVO rate through the inlet and/or return line until symptoms subside. Symptoms should be reported to the clinic attending physician and an order can be obtained for 1-2 TUMS PO or IV calcium gluconate, if applicable. Patients can be instructed to take two TUMS the evening before the next apheresis and the morning of the apheresis.

8.2 **Moderate Symptoms:** If symptoms progress to large muscle cramping, nausea and vomiting, or mild symptoms are unrelieved by TUMS, the clinic attending physician should be notified and an order for IV calcium gluconate can be obtained, if not already started.

8.3 **Documentation: Grade 3 and 4** citrate toxicity will be documented on the APBMT-COMM-030 FRM1 Adverse Event Form. Citrate toxicity categories are listed as Hypocalcemia – Clinical. Place a check mark next to the numerical value and symptom description that best represents the donor's results and symptoms.

8.4 IV Calcium Administration

8.4.1 Obtain doctor's order for IV calcium. The usual dose in apheresis will be 4 grams calcium gluconate which may be mixed in a 250 mL bag of saline. Other calcium gluconate ordered doses are available for use. Per apheresis nurse's discretion, ordered IV calcium gluconate can be given as a precaution to citrate toxicity. The usual dose in photopheresis will be 2 grams calcium gluconate which may be mixed in 100 mL bag of saline. Calcium gluconate can **only** be given if patient is in double needle mode in photopheresis.

8.4.2 Attach IV tubing and 0.22 micron filter to the triple connection at the end of the return line. IV calcium should be infused via the return line as distal as possible to prevent a reversal in effect from the citrate.

8.4.3 Infuse at a rate of 50-75 mL/hour, and instruct the patient to report side effects of feeling warm or a bitter taste in the mouth. The infusion rate can be decreased if side effects from the calcium occur.

8.5 Heparin Protocol

8.5.1 If citrate toxicity symptoms cannot be managed with IV calcium infusion in apheresis, the heparin protocol can be used (refer to ABMT-COLL-014 *Heparin Protocol*).

8.5.2 Heparin protocol cannot be used if the patient/donor platelet count is less than 50,000.

9 RELATED DOCUMENTS/FORMS

9.1 ABMT-COLL-014 Heparin Protocol

9.2 APBMT-COMM-030 FRM1 Adverse Event Form

9.3 APBMT-COMM-035 Detection & Management of Adverse Events

10 REFERENCES

10.1 McLeod, B, et.al. Eds. Principles of Apheresis, AABB Press, Current Edition.

11 REVISION HISTORY

Revision No.	Author	Description of Change(s)
06	Sally McCollum	References updated with new title for APBMT-COMM-035 Detection & Management of Adverse Events and APBMT-COMM-030 FRM1 Adverse Event Form. Section 8.5.1 corrected to ABMT instead of APBMT for SOP title. Added information regarding photopheresis to correlate with APBMT-COMM-035.

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