Welcome to eSessions

This session contains audio.
Review the information on each slide before continuing.
TROUBLESHOOTING MNC COLLECTION PROCEDURES

COBE® SPECTRA APHERESIS SYSTEM

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Getting Around

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Presentation Overview

- Patient/donor considerations
- Procedural adjustments
- Troubleshooting
- Resources
Presentation Objectives

Participants will be able to:

- State the first action to take when a patient or donor has a citrate reaction
- Describe the effect that increasing the Inlet:AC ratio has on the extracorporeal circuit and on the collected product
- List two potential causes of interface instability
- List two potential causes of a low CD34+ cell yield
PATIENT/DONOR CONSIDERATIONS
Patient/Donor Considerations

- Diagnosis
- Medical history and present condition
  - Current disease state
  - Lab values: Hct/Hgb, electrolytes, coagulation profile, proteins
  - Medications
Citrate Toxicity

Potential reasons for patient/donor citrate toxicity include:

- Citrate infused faster than metabolized
- Low levels of ionized calcium, magnesium, and/or potassium
- Poor nutritional status
- Kidney or liver impairment
- Large-volume leukapheresis
Preventing Citrate Toxicity

- Understand the physiological effect an apheresis procedure can have on a patient or donor
- Know the individual’s history, including diseases, medications, and lab data
- Have a plan for preventing citrate infusion-related symptoms
- Be prepared if symptoms occur anyway
Citrate Reaction

- Pause the procedure.
- Decrease the inlet pump flow rate
- Consider IV electrolyte supplementation (calcium, magnesium, potassium)
PROCEDURAL ADJUSTMENTS
Increasing the Inlet Flow Rate

- Blood processed
- Inlet flow rate
- Time
- AC infusion rate
- Citrate toxicity
Increasing the Inlet:AC Ratio

- Inlet flow rate increases
- Clumping in the circuit and the product

- Time decreases
- Same AC infusion rate

Inlet:AC ratio
Changing the Plasma Flow Rate

- Monitor the interface
- Make appropriate changes
Interface Control

Make incremental changes to the plasma pump flow rate. Allow 3 to 5 minutes between changes.

- If the color is too light, increase the plasma flow rate
- If the color is too dark, decrease the plasma flow rate
- Make larger changes (~1 mL/min) if the interface is either too low or too high
- Make smaller changes (~0.3-0.5 mL/min) if the interface is almost on target
TROUBLESHOOTING
Potential Conditions

- Unstable interface
- Platelet aggregation
- High cross-cellular contamination
- Low CD34+ cell yield
Unstable Interface

- **Cause**
  - Low access pressure

- **Management**
  - Obtain and maintain good venous access
  - Keep the patient warm
  - Use the appropriate inlet flow rate
Unstable Interface (continued)

- **Cause**
  - Poor mobilization or poor separation

- **Management**
  - Change the plasma flow rate to an appropriate rate
  - Check pre-CD34+ cell count to determine if the patient has mobilized
  - Increase the separation factor to about 800 to 900 (will result in an increased platelet loss and increased platelet contamination)
Separation Factor*

The separation factor is a function of channel dwell time and centrifugal force

*Separation factor for MNC procedures is 500
Unstable Interface

- **Cause**
  - Platelet aggregation

- **Management**
  - Provide appropriate amount of anticoagulation
Platelet Aggregation

- Causes
  - Inadequate anticoagulation
  - Use of heparin as anticoagulant

- Management
  - Provide adequate amount of anticoagulation*
  - Use ACD-A instead of heparin

*According to the COBE Spectra system operator’s manual: Decrease ratio to as low as 9:1 if the platelet count and hematocrit are normal or high; increase ratio to as high as 15:1 if platelet count and hematocrit are low.

*According to the literature: Use AC/heparin mix (e.g. 5,000 IU of preservative-free heparin per 500 mL ACD-A), using ratios as high as 30:1 and adding about 10% ACD-A to the collect bag.
High Cross-Cellular Contamination

- **Cause**
  - Unstable interface

- **Management**
  - Achieve a stable interface
  - Increase the separation factor to about 800 to 900 (will result in increased platelet loss and increased platelet contamination)
High Cross-Cellular Contamination (continued)

- **Cause**
  - Higher platelet contamination from collecting too light*

- **Management**
  - Collect darker

*Collect line Hct has only a small effect on platelet contamination of the collected product*
High Cross-Cellular Contamination (continued)

- **Cause**
  - High RBC contamination from collecting too dark

- **Management**
  - Collect lighter

**NOTE:** Collect line Hct in the range of 2%-8% has little effect on granulocyte contamination of the collected product.
Interface Control

Interface too dark:
Collecting too deep in the RBC layer
- ↓ plasma pump flow rate.

Interface too light:
Not collecting deep enough in the RBC layer
- ↑ plasma pump flow rate.
Low CD34+ Cell Yield

- Causes
  - Collecting in the wrong layer
  - Unstable interface
  - Low patient pre-CD34+ cell count
  - Processing an inadequate amount of blood
Low CD34+ Cell Yield (continued)

- **Management**
  - Collect at an Hct of 4% to 5%
  - Maintain a stable interface
  - Check pre-CD34+ count to determine if patient has mobilized
  - Process at least 2 x TBV, and consider large-volume leukapheresis
  - Adjust collect flow rate based on inlet flow rate and MNC count
KNOW YOUR RESOURCES!

Click here to continue
Resources

- Terumo BCT 24-hour support line: 877.339.4228
- Other COBE Spectra system operators
- Apheresis resources:
  - Apheresis Principles and Practice (text)
  - Transfusion (journal)
  - Journal of Clinical Apheresis (journal)
  - Principles of Apheresis Technology (ASFA)
Reference