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NEPHROLOGY PROGRAM
DEPARTMENT POLICIES AND PROCEDURES

Hemodialysis - Section 10 - Gambro Artis - Neph 10-06
Utilizing Hemoscan Function with Gambro Artis Hemodialysis Machine
No.: 00758 (TOH Standardized Policy Number)

ISSUED BY:
Hemodialysis Clinical Practice Committee

DATE OF APPROVAL:
N/A

APPROVED BY:
Program Clinical Director and Division Head

LAST REVIEW/REVISION DATE:
2015/11

CATEGORY:
Gambro Artis

IMPLEMENTATION DATE:
2011/09

PURPOSE:

- Measuring the change in blood volume allows staff to assess the effect of ultrafiltration on blood volume reduction. It can also be used to determine the amount of fluid removal tolerated by the patient. The information retrieved is needed to determine guidelines for the use of HemoControl

BACKGROUND STATEMENTS:

1. The Hemoscan function on the Artis machine allows the user to monitor the patient's blood volume to assist in assessment of fluid removal
2. The blood tubing used for hemodialysis has the necessary cuvette to allow measurements for all patients
3. Hemoscan works on the assumption that:
    - Actual Hgb (hemoglobin) content remains the same during treatment (e.g. patient not actively bleeding or receiving blood products)
    - Decrease in plasma water causes a relative increase in Hgb concentration
    - Increase in plasma water causes a relative decrease in Hgb concentration
4. Blood flow must be above 180ml/min and Hgb between 60-160 g/L

5. The Hemoscan reading starts at 0 and will become a negative percentage number (e.g.: -2%) as fluid is removed from the patient's vascular space. If the patient's vascular space receives fluid (e.g.: fluid shifting in response to higher dialysate Na or albumin), the blood volume could become positive until such time as that fluid is ultrafiltrated.

   – ***Note:*** Patient assessments should take precedence over Hemoscan readings

DEFINITION(S): N/A

ALERTS: N/A

PROCEDURE:

Section A: Activate Hemoscan Function

1. The Hemoscan function is preset to start with every treatment. In the event the Hemoscan function is not on, do the following before starting treatment:

   - Press the 'Hemoscan' option on the 'Activated Functions' list in the 'Prescription' screen or on the 'Blood' screen. The 'Hemoscan Setting' sub-screen will be opened
   - Verify the 'Alarm Limit' setting. For new patients starting in other units set the initial alarm limit to -10%
   - ***Note*****:** Once Hemoscan has been completed on a patient for 3-5 stable treatments, the nurse may establish the alarm limit based on previous treatments by using the final Hemoscan value (BV% in NephroCare)

2. The limit may be changed by pressing the 'Alarm Limit' button

3. Press the 'Hemoscan' button to activate the function. When the Hemoscan is activated:

   - Hemoscan action indicator becomes green
   - the Hemoscan icon is displayed on the screen
   - in the 'Prescription' screen, the Hemoscan action indicator in the 'Activated Functions' list becomes green

4. Press 'Close'

   - ***Note****:* If the 'HemoControl' function has been activated, the 'Hemoscan' button is not available but the function is in use as part of the HemoControl program. 'Hemoscan' cannot be deactivated when 'HemoControl' is activated

Section B: Hemoscan Monitoring

1. When the 'Start Treatment' button is pressed, the Hemoscan function will start taking measurements:
   - It will take a few minutes to display the initial reading
   - Readings can be viewed on the 'Home' screen (numeric value) and in the 'Hemoscan Settings' screen (displayed as numeric value and graph)
2. The 'Hemoscan Settings' screen will display:
   - the 'Blood Volume' value (the latest measurement)
   - the 'Blood Volume' values are plotted on the Hemoscan graph
3. The 'Blood Volume' value will increase (+ %) or decrease (- %) throughout the treatment. In the event Hemoscan is not displaying a reading, consider the following:
   - Hgb is out of monitoring range (60-160 g/L)
   - The cuvette is incorrectly inserted
   - The sensor bar door is open
   - Blood flow is lower than 180ml/min
   - IV Fluid is being delivered to the patient

Section C: Hemoscan Alarms

1. The Hemoscan function will alarm during treatment when the 'Blood Volume' value falls on or below the alarm limit. **The nurse must complete a patient assessment**

- If the patient is symptomatic, consider the following interventions:
  - Do a stat BP
  - Administering a 0.9% NaCl bolus
  - Stopping UF to allow patient's blood volume to refill
  - Lowering the patient's head and raising feet
  - Reassessing the patient's goal for this treatment
  - Monitoring BP more frequently
- If the patient is asymptomatic, consider the following:
  - Is the alarm setting appropriate for this patient? (***Note:*** the 'Blood Volume' alarm must be decreased to silence the alarm)
  - Is the patient receiving blood products (may need to deactivate Hemoscan function)
  - Monitoring BP more frequently
  - ***Note:*** Every patient has a different tolerance level to fluid removal reflected in Hemoscan

- To decrease the 'Alarm Limit':
  - Press the 'Alarm Limit' button
  - Select an appropriate value (i.e.: increase/decrease by a value of 2-3%)
  - Press 'Confirm'
  - ***Note:*** Improper setting of this limit may result in hypovolemia (alarm limit too low) or hypervolemia (alarm limit too high)

Section D: Deactivate Hemoscan

1. The Hemoscan function can be deactivated at any time before or during treatment *except* when the Hemocontrol function is activated. HemoControl must be deactivated in order to deactivate Hemoscan
- Press the 'Hemoscan' button, a confirmation window will appear
- Press 'Confirm' then 'Close' to close the screen
- The Hemoscan action indicator will be gray
- The Hemoscan icon will no longer appear on the 'Home' screen
- The Hemoscan graph is available but no longer updated
- ***Note:*** Once deactivated manually, Hemoscan cannot be reactivated

2. The Hemoscan function is automatically deactivated in the following cases:
- When starting a 'Change Circuit' procedure, data will still be available
- When unloading the cassette
- After a 'Fast Recovery' procedure

3. Consider deactivating Hemoscan in the following circumstances as readings may be false:
- Patient is receiving blood products
- Continuous IV infusions (e.g: 0.9% NaCl, tPA)
- If the patient is actively bleeding

DOCUMENTATION:

- NephroCare records the BV% volume when rounds are captured. To ensure a final BV% volume is captured, a final assessment including BP should be performed prior to rinseback
- Where patients experience symptoms of hypotension, the BV% volume should be documented in progress notes

RELATED POLICIES / LEGISLATION: N/A

REFERENCES:

1. Gambro Artis User Manual, 2012 Version 8.09
2. Gambro PowerPoint Presentation - Principles of Fluid Removal

COMMENTS / SIGNIFICANT REVISIONS: N/A