



**NEPHROLOGY PROGRAM
DEPARTMENT POLICIES AND PROCEDURES**

**Hemodialysis - Section 03 - Patient Assessment & Management - Neph 3-02
Vascular Access Recirculation Testing Using Blood Sampling Technique
No.: 00727 (TOH Standardized Policy Number)**

ISSUED BY:

Hemodialysis Clinical Practice

DATE OF APPROVAL:

N/A

APPROVED BY:

Nephrology Steering Committee

LAST REVIEW/REVISION DATE:

2012/12

CATEGORY:

Patient Assessment and Management

IMPLEMENTATION DATE:

2001/01

PURPOSE:

- To determine the percentage of recirculation (%R) that is occurring in a vascular access during a Hemodialysis treatment

BACKGROUND STATEMENT:

- Access flow measurement is the best method of detecting access problems, but if unable to do access flow measurement, then blood sampling for recirculation should be done
- In theory, any recirculation is abnormal but in recirculation measurements using blood samples, up to 5% is acceptable (Cardiopulmonary recirculation). Results greater than 10% should be investigated
- Further investigations should be completed if recirculation via blood sampling is greater than or equal to 10%

SUPPLIES:


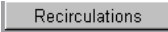


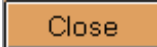


- 3- alcohol prep pads
- 3- disposable vacutainer holders SPD # 009450
- 3- 21 gauge Eclipse blood collection needles SPD # 155445
- blue clamp
- 3-5 ml blood tubes – PST tube
- 3 lab requisitions – marked for urea testing designated as:
 - A – arterial blood line sample #1
 - V – venous blood line sample #2
 - S – arterial needle sample #3

PROCEDURE:

1. Explain the procedure to the patient
2. Initiate hemodialysis according to procedure
3. Increase blood flow rate to the prescribed amount
4. Perform hand hygiene and don PPE
5. Draw samples within the first 30 minutes of treatment with the blood pump at the prescribed rate
6. The samples need to be drawn as quickly as possible by:
 - Arterial sample (A)- using one of the vacutainer holders with the 21 G blood sampling needle, fill the blood tube from the arterial sample port on the bloodlines.
 - Venous sample (V) - using one of the vacutainer holders with the 21 G blood sampling needle, fill the blood tube from the venous sample port on the bloodlines.
 - Arterial needle sample (S):
 - After obtaining the Arterial and Venous samples reduce the blood flow to 120 ml/min for exactly 10 seconds and stop the blood pump.
 - Clamp the arterial bloodline between the arterial bloodline port and the arterial drip chamber.
 - Using the third vacutainer holder and the 21 g blood sampling needle, fill the blood tube from the arterial bloodline port. This will represent the systemic urea blood level (S).
7. Remove the clamp on the arterial bloodline, restart the bloodpump and increase the bloodflow to the prescribed blood rate.
8. Ensure the blood specimen requisitions are filled out properly to help in interpretation of the results. Note that although we are attempting to draw the samples at the same time, we must label the reqs with 3 different times:
 - (A) arterial blood line sample #1 (e.g. 13:20 hrs)
 - (V) venous blood line sample #2 (e.g. 13:21 hrs)
 - (S) arterial blood line sample #3 (e.g. 13:22 hrs)
9. The formula used for the calculation of the percentage of recirculation is:
$$\frac{S - A}{S - V} \times 100 = \% \text{ Recirculation}$$
10. Nephrologist/delegate and Nephrology Access Coordinator should be informed of any results greater than 10 %.

DOCUMENTATION:

Document the recirculation rate in NephroCare as follows:

1. Choose appropriate patient on main screen
2. From the Dialysis menu click on Hemodialysis Access, 
3. Highlight the patient's present active hemodialysis access.
4. Click on 
5. The list of past measurements / recirculations will be displayed,
6. Click on the first 
7. From the Recirculation Table,
 - Enter the Recirculation % in the Recirculation Rate (%) field
 - open the dropdown under Measurement Type and select 'Blood samples',
 - Enter in the comment box: the QB and BP when the samples were obtained.
 - **Do not enter anything in the Flow rate, Mean Flow rate or Standard Deviation columns.
8. Ensure information is correct, then click  and 
9. Click  to return to the main screen,
10. Document in the  in NephroCare, using the title HEMO ACCESS the actions taken if recirculation $\geq 10\%$ is found.

DEFINITION(S): N/A

ALERTS: N/A

RELATED POLICIES / LEGISLATION: N/A

REFERENCES:

1. National Kidney Foundation, DOQI Clinical Practice Guidelines for Vascular Access (2000), guideline 10.
2. Up-to-date online 16.2 arteriovenous fistula recirculation in hemodialysis, Michael Berkoben, MD, Steve J.Schwab, MD (Last updated 2008).

COMMENTS / SIGNIFICANT REVISIONS: N/A