



## MANITOBA RENAL PROGRAM

<b>SUBJECT</b> <ul style="list-style-type: none"> <li>Fresenius 5008 Air Detected Below the Venous Bubble Catcher</li> </ul>	<b>SECTION</b> 30.10 Hemodialysis Equipment and Procedures
	<b>CODE</b> 30.10.07
<b>AUTHORIZATION</b> <ul style="list-style-type: none"> <li>Professional Advisory Committee, Manitoba Renal Program</li> <li>Nursing Practice Council, St. Boniface Hospital</li> </ul>	<b>EFFECTIVE DATE</b> February 16, 2012
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### PURPOSE:

- To prevent air that has inadvertently entered the extracorporeal blood circuit from being infused to the patient.
- To troubleshoot and correct an air detector alarm situation (either real or false).
- To manage an incident where a patient has received an air embolus.

### POLICY:

- Registered Nurses and Licensed Practical Nurses who have received instruction and demonstrated competency to the renal educator or delegate may respond to an air detector alarm.
- The proper functioning of the bubble catcher level set shall be verified prior to each hemodialysis treatment as described in Procedure 30.10.01 *Use of Fresenius 5008 – Delivery System*.

### EQUIPMENT:

- 100 ml 0.9% NaCl IV bag
- Emergency supply kit
- Spike for IV bag
- Luer lock y-line
- 2 x 10ml syringes with NS
- Safety line (adaptation device)
- 20 ml syringe prn for foam removal
- Supplies for accessing CVC line as per MRP policy 30.30.02 if needed
- Safety Line adaptation device) PRN

### KEY POINTS:

- Air in blood emergency supply kits shall be prepared and stored in a designated area(s) in each dialysis unit.
- Not part of Supply Kit

### PROCEDURE:

#### A. Prevention

### KEY POINTS:

## PROCEDURE:

Prior to initiating the hemodialysis treatment:

1. Ensure the venous bubble catcher is properly seated in its holder and the bloodline below properly inserted in the sensor.
2. Ensure the proper functioning of the level set has been checked prior to the initiation of the treatment.
3. Ensure that all connections are secure.
4. **Ensure that heparin line is clamped (and cap is secure) if patient to be dialyzed heparin free.**

## **B. Troubleshooting the Air Detector Alarm**

*Message reads "Air detected below the venous bubble catcher Disconnect the patient, connect the arterial and venous blood lines to a NaCl solution!"*

1. Clamp the arterial and venous bloodlines and access lines to protect the patient from air embolism.
2. Check the extracorporeal circuit for air and ensure all connections and injections sites are tightly closed
3. Prepare 100 ml bag of 0.9% NaCl with spike and "Y" line and prime both limbs of the line.
4. Disconnect both the arterial and venous bloodlines from the vascular access using aseptic technique.
5. Flush each of the venous and arterial accesses with 10 ml 0.9% NaCl.
6. Attach the bloodlines to the Y line.
7. Open clamps on the arterial and venous bloodlines and "Y" line.
8. Press CONFIRM once the patient is disconnected and blood lines are attached to Y-line.
9. *Message reads: "Has the patient been disconnected and have the blood lines been connected to a bag of NaCl?"*

## KEY POINTS:

- During the rinse, if the line in the sensor is not seated properly, an alarm will stop the blood pump.
- This step is described in Procedure 30.10.01 *Use of the Fresenius 5008 System* and should be documented as part of the "Pre-checks" on the *Hemodialysis Treatment Record*. Level of the drip tube in the chamber/bubble catcher should be 0.5-1.0cm below the fluid level.
- Microbubble detected is a different alarm that can be reset twice (**if no visible air in the circuit**) before requiring air removal procedure.
- The Microbubble message will appear momentarily in the message button (parking lot).
- If air visible in the venous blood line, place patient on the left lateral Trendelenberg position and administer oxygen. Notify physician immediately and/or activate Code Blue.
- Info window can be displayed by touching the "?" button throughout the air removal procedure.
- Priming the limbs prevents additional air from entering the blood circuit.
- If using CVC access line as per MRP policy 30.20.02
- Do not open roller clamp on the saline administration line or T-line.

## PROCEDURE:

Press CONFIRM.

### 10. *Message reads: "Infuse air into NaCl solution?"*

Press START blood pump.

### 11. Turn dialyzer blue end up to aid in air removal.

### 12. After visible bubbles and/or foam have been trapped in saline bag, the blood pump rate may be slowly increased to aid in air removal PRN.

### 13. If necessary, use the 20 ml syringe on the venous chamber/bubble catcher medication port to remove foaming blood from the venous bubble catcher adjustment.

### 14. Change the venous pressure monitor line if it becomes wet with blood or saline.

### 15. Once all air is removed from the venous blood line, turn dialyzer red end up.

### 16. *Message reads "Air is infused into the bag of NaCl Make sure that the venous blood line is air-free"*

a. Make sure venous bloodline is air free.

b. If no visible air in system, press blood pump STOP.

c. The blood pump can be stopped before 200 ml has circulated by pressing the STOP button.

### 17. Press Blood System Screen and adjust venous chamber/venous bubble catcher level if necessary.

### 18. *Message reads: "Venous Blood line air free?"*

a. Press **Yes** if air free.

b. If air remains press **No** and repeat steps 11-18

### 19. *Message reads: "Connect the blood lines to the patient! Adjust the blood flow rate to the desired value!"*

a. Reconnect the patient using aseptic technique.

## KEY POINTS:

- Default setting for pump speed is 50 ml/min.
- The pump will run until 200 ml has been circulated.

- Maximum rate 150 ml/min.

- Attach "Safety Line" (adaptation device) to venous medication port and venous pressure port.

- Maximum of 20 minutes time to clear air from bloodlines.
- If unable to clear lines of air, discard bloodlines. Notify Nephrologist for order to draw CBC next treatment.

- For CVC perform cleaning procedure as per MRP policy 30.20.02

## **PROCEDURE:**

- b. Press CONTINUE treatment.
20. Adjust the blood flow rate to desired value.
21. Make sure the UF Timer light is on.

## **KEY POINTS:**

- The blood pump will start with the last flow rate displayed.

## **C. Managing an Air embolus Incident**

1. Call for help and appropriate code.
2. Ensure venous blood line is clamped and pump is off.
3. Clamp venous and arterial access.
  - To prevent air remaining in blood line from infusing to patient.
4. Place patient in Trendelenburg on left side.
5. Assess vital signs.
  - If air has travelled up the jugular vein into cerebral venous system, this may cause loss of consciousness, seizures or death.
  - If patient is recumbent, air may enter the right ventricle then on to the lungs causing dyspnea, cough and chest pain.
  - If the patient is lying on right side, the air may travel to the pulmonary arteries resulting in acute pulmonary hypertension.
6. Administer oxygen by mask.
7. Notify Nephrologist/Physician immediately.

## **DOCUMENTATION:**

- Hemodialysis treatment record (form #1592)
- IPN in Patient Health Record as needed

## **REFERENCES:**

ANNA. (2008) Core Curriculum for Nephrology Nursing 5<sup>th</sup> edition

Fresenius Medical Care 5008 Hemodialysis System Operating Instructions: Edition 10/08. 13

Fresenius 5008 Therapy System: Advanced Training Resource Binder. Prepared for Manitoba Renal Program June-July 2011. Fresenius Medical Care Canada, Richmond Hill ON.