



MANITOBA RENAL PROGRAM

SUBJECT <ul style="list-style-type: none"> Fresenius 5008 Preparation for Hemodialysis using the ONLINEplus™ System 	SECTION 30.10 Hemodialysis: Equipment and Procedures
	CODE 30.10.02
AUTHORIZATION <ul style="list-style-type: none"> Professional Advisory Committee, Manitoba Renal Program Nursing Practice Council, St. Boniface Hospital 	EFFECTIVE DATE April 20, 2018
	REVISION DATE

PURPOSE:

- To describe the policies and procedure for preparing Fresenius 5008 hemodialysis delivery system using ONLINEplus™ while maintaining pathogen free pathway.

POLICY:

- Nurses who have received instruction and who have demonstrated competency to educator or delegate may perform this procedure.
- Health Sciences Centre, Seven Oaks Hospital, Brandon Regional Health Centre and Local Renal Health Centres Unit Assistants, Nursing Assistants and Health Care Aides who have received instruction from the Renal Educator or delegate and who have demonstrated competency to the Renal Educator or delegate may perform part of this procedure as indicated with symbol Φ
- St. Boniface Hospital Health Care Aides who have received instruction from the Renal Educator or delegate and have demonstrated competency may perform part of this procedure as indicated with symbol Δ .
- ONLINE priming can only be done in patient care areas connected to the main Reverse Osmosis (RO) system or specified portable Reverse Osmosis machines (AquaC Uno H)
Do not use ONLINE priming when using Aquaboss or Aqua Uno portable RO systems.
- ONLINE priming can only be done if the Fresenius 5008 has completed a disinfection cleaning cycle after the last patient treatment performed. A Heat Disinfection cycle must be completed within 72 hours prior to using ONLINE priming.
- The Fresenius 5008 Hemodialysis delivery system (internal pathways and external surfaces) shall undergo cleaning and disinfection as outlined in MRP Procedure 30.10.18 *Cleaning and Disinfection of the Fresenius 5008 Hemodialysis System: Internal Fluid Pathways and External Surfaces.*
- For infection prevention and control purposes, a primed extracorporeal circuit including dialyzer must be discarded **once 3 hours has elapsed** if unused after set up.
- Following a Code Blue or Critical Clinical Incident, the delivery system along with concentrates intact shall be removed from service to be inspected by a Dialysis Technologist. To preserve patient information the machine must be left in the same mode as it was when incident occurred (i.e. do not put into a cleaning cycle). Remove the blood lines and inspect for defects, describe (take photo if necessary) and document.

EQUIPMENT:

- Fresenius 5008 Cordiax Therapy Hemodialysis machine connected to water system as per Policy statement #4 above.
- Fresenius blood lines AV-Set ONLINE plus BVM 5008R
- Dialyzer per physician order
- Acid concentrate and bicarbonate concentrate or bi-bag® as per physician order
- Heparin Sodium 1000 units/mL
- 20 mL syringe with needle
- Total Chlorine strips to test for chemical residue prn

PROCEDURE:

1. Perform hand hygiene.
2. ☐ ▲. Turn machine on by pressing I/O key.
3. If necessary, check for residual disinfectant according to the manufacturer's instructions for use on the bottle and prompts on the screen. Document on hemodialysis treatment record.
4. Verify that the machine is in "Standard" mode for adult patients, unless otherwise ordered by physician.
5. Connect the bi-bag® and acid concentrate.
 - a. To connect the bi-bag®:
 - i. Open the bicarbonate flap.
 - ii. Remove seal from the bi-bag®.
 - iii. Place the bi-bag® on the ports and press down to connect.
 - iv. Close the bicarbonate cover flap
 - b. To connect acid concentrate:
 - i. Verify that the acid concentrate matches the Medication Administration Record (MAR).
 - ii. Verify dialysate number on acid concentrate jug matches dialysate number on dialysate screen.
 - iii. Connect the acid line to the acid concentrate:
 - Open the concentrate flap.
 - Place the red concentrate suction tube into the acid container.
 - iv. Close the concentrate flap until it clicks into place.
 - v. Document

KEY POINT:

- Refer to MRP Policy 30.10.18 *Cleaning and Disinfection of the Fresenius 5008 Hemodialysis System.*
- If machine is in Pediatric mode, a teddy bear icon is displayed at the top of the screen.
- Pediatric mode may not allow full blood flow (QB) or fluid removal rate.
- To revert to Adult mode, touch the blue tile on right hand side of screen "HD-PAED"
- Select HD-PAED off. A prompt will appear to confirm section. Connect the bi-bag and acid concentrate
- Confirm that acid concentrate connected corresponds with patient specific order.
- Check the expiry date on bi-bag®
- Invert bag to check filter
- Alternatively insert patient card and confirm dialyzer and acid concentrate settings.

6. Touch *"Treatment"* to start T1.
The T1 test begins automatically. If T1 not started press "Start T1 test" from Blood System screen.
 - The T1 test is now running in parallel with the preparation of the hemodialysis system.
 - The T1 indicator bar is displayed in the top left corner of the display screen during the T1 test.
 - If any portion of the T1 test has failed a message will appear prompting further action.

7. On preparation screen select corresponding dialyzer to patient's prescription.

8. Perform hand hygiene.

9. ☐ Place dialyzer in holder and attach dialyzer port caps as needed.
 - Extracorporeal Circuit can be inserted during T1 test.

10. ☐ Perform hand hygiene and open bloodline package and tighten all connectors and caps. .

11. ☐ **Install Arterial Bloodline:**
 - a. Clamp "T" line
 - b. Insert the red guide into the blood pump until a signal is heard. The arterial pressure measurement unit will now open automatically.
 - c. Insert the arterial pressure dome into the arterial pressure measurement unit.
 - Soft side in.
 - An audible ding indicates that the pump segment loaded correctly.
 - Refer to MRP Policy 30.10.21 *Manually Opening Arterial Measurement Unit on the Fresenius 5008* if arterial pressure measurement unit does not open.
 - d. Insert the arterial blood line into the arterial occlusion clamp.
 - e. Insert the blood volume measurement segment into the BVM measuring head and close door.
 - f. Insert the arterial blood line into the Blood Temperature Monitor (BTM) measuring head and close the flap.
 - g. Insert the patient end of the arterial line into the line holder (on dialyzer holder).
 - h. Insert the arterial bloodline into the line holder to the upper left of the blood pump.
 - i. Attach dialyzer end of arterial bloodline to the port of dialyzer.
 - Maintain aseptic technique when handling open blood lines and connection sites.

12. ☐ **Install Venous Bloodline:**
 - a. Close the clamps on the two venous medication ports/lines.
 - b. Insert the venous bubble catcher/chamber into the level detector.
 - The venous bubble catcher/chamber must directly rest against the locator.
 - Maintain aseptic technique when handling open blood lines and connections.

- c. Insert the venous blood line into the venous monitoring device.
 - d. Insert venous blood line into venous occlusion clamp.
 - e. Insert the venous line into the Blood Temperature Monitor (BTM) measuring head and close the flap.
 - f. Insert the patient end of the venous blood line into the line holder (on the dialyzer holder).
 - g. Attach the rinse port connector (from bloodline package) to patient end of venous blood line.
 - h. Attach the venous pressure monitor line to the venous pressure port (transducer).
 - i. Insert venous blood line into the line holder above the venous bubble catcher.
 - j. Connect the venous blood line to the remaining port of the dialyzer.
- The venous monitoring device contains optical detector and air bubble detector.

13. Φ Install Safeline (Substitute pump segment with 2 ends)

- a. Insert Safeline pump segment into the lower pump on the Fresenius 5008.
 - b. Attach the patient end of arterial blood line to the Safeline blue connector.
 - c. Place line into line holder (beside right side of the pump).
 - d. Leave substitute line unconnected and in trough.
 - e. Close the doors.
- Audible “ding” will occur once Safeline has been inserted correctly.
 - After closing the doors the blood pump and substitute pump segments will be automatically loaded.

14. Priming and Rinsing the Extracorporeal Circuit and Dialyzer

When T1 test is completed and passed, prompt appears to connect the rinse and substitute connectors and the dialyzer couplings.

- a. Perform hand hygiene
 - b. Pull and turn the substitute port catch counter-clockwise to open.
 - c. Remove the end cap and push the substitute connector (on Safeline) firmly into the substitute port. Close the catch so that it holds the line in place.
 - d. Pull and turn the rinse port catch counter-clockwise to open.
- Maintain aseptic technique when handling open blood lines and connections.

- e. Remove the venous blood line which has the rinse port connector attached from the dialyzer holder. Remove the end cap and push the rinse port connector firmly into the rinse port. Close the catch so that it holds the line in place.
- f. Close both outer doors.
- g. Connect dialyzer couplings to the dialyzer with arterial (red) side up. The system will automatically switch to the Preparation Screen.
- h. Close shunt/interlock door.
- i. Message appears: *Priming/ Rinsing*. Press Start.
- j. Allow dialyzer to fill/prime with dialysate.
- k. Once the dialysate side of the dialyzer is primed, Priming/Rinsing of the blood lines will then start automatically. When blood pump starts flip dialyzer blue end up. If patient requires additional rinse volume (as per policy statement #7 above, program rinse volume to 2500mL.
 - Check dialyzer to ensure fully deaerated on dialysate side. If not allow more time before flipping dialyzer blue end up.
 - A connection test occurs at the beginning of priming, a bolus and during reinfusion. The connection test verifies the integrity of the blood circuit.
 - Pump speed preset at 150 mL. Facilitates air removal blood line side.
 - Rinse volume preset 500mL
 - ONLINE UF rinse volume = 200 mL.
- l. Blood pump speed automatically reduces to 50 mL/min when the online rinse volume has been reached.
- m. Once the pump reduces to 50mL/min the system will indicate it is in *PRECIRCULATION* mode and the 5008 is now ready for patient treatment to begin.

15. Preparing the Heparin Syringe

The heparin pump can be set up any time during preparation. If blood pump is running ensure that the heparin line is clamped prior to attaching the heparin syringe.

- a. Perform hand hygiene. Connect heparin syringe to the heparin line.
- b. Press on the clamping bracket to move the grip handle to its lower position.
- c. Place the heparin syringe between the barrel holders. The syringe wings must be positioned between the barrel holder & the bracket.
- d. Press on the clamping brackets to move the grip handle to its starting position. The thumb rest of the syringe plunger now must be positioned between the clamps of the grip handle.
 - Follow facility policy for preparation and administration of heparin.
 - Ensure overfill is not greater than 1.5 mL of total required treatment dosage.
 - The syringe is correctly secured if it is no longer possible to move the thumb rest of the syringe plunger without pressing on the clamping brackets.

- e. Open the clamp on the heparin line and close the doors.
- f. If patient is dialyzed heparin free; ensure that the heparin line is clamped and that the cap is securely tightened.
- Once doors are closed the machine will automatically prime the heparin line and perform a connection test.
- To prevent formation of microbubbles in the extracorporeal blood circuit during treatment.

16. External and visual tests

- a. Check for a normal dialysate flow by observing moving bar across dialysate icon. Document.
 - Located on the left side top of the screen.
- b. Open the Shunt/Interlock door and verify that the dialysate flow is stopped. Document.
 - The moving bar across dialysate icon should stop.
- c. Level of the drip tube in the venous chamber/bubble catcher should be 0.5-1.0 cm below the fluid level. Confirm visually and document.
 - Perform level set if necessary (located on the Blood System screen)
- d. Verify venous line in occlusion clamp. Document.
- e. Confirm:
 - Machine is in Precirculation mode
 - Rinsing volume done
 - Qb at 50 mL/min
 - ONLine UF 200 mL rinse completed
 - BVM “cup” is filled/green
 - If ONLine 200 mL rinse is not completed and/or BVM “cup” is not filled/green treatment can be started. However, BVM function will not be available for the treatment.

17. Setting Treatment Parameters:

- a. Press the *PREPARATION* button. Confirm and set dialyzer and UF time.
 - Other than dialysate bath selection, parameters may be set at any time during preparation.
- b. Press *Dialysate Menu*. Confirm and set the following values:
 - Concentrate dialysate number
 - Prescribed Na+
 - Prescribed Bicarbonate
 - Dialysate Flow will read 100ml/min.
 - Dialysate Temperature
 - Press OK
 - If using Patient Card, settings will be entered automatically. Confirm that settings are correct for patients prescribed treatment.
 - If Autoflow is prescribed it can be programmed during set-up.
- c. Confirm and Set the Na+ Profile:
 - Select Na+ profile screen
 - Select the appropriate profile
 - Set the Na+ start value using the rocker switch
 - Press OK
 - Na+ profile can only be selected once UF time is entered.
 - Maximum starting Na+ is shown by default and must be adjusted to reflect appropriate start Na+.
- d. Set Online Clearance Monitor (OCM) parameters:
 - Touch Options button; then the OCM button.
 - Confirm/Set the following parameters
 - Goal Kt/V
 - The OCM measurement starts approximately 10 to 15 minutes after the start of the treatment (optical detector senses blood).
 - The following dialysis parameters are checked for stability before the OCM measurement is started.
 - Stable conductivity

- V (urea) (patient volume)
 - Ensure OCM button lit
- Press OK

- e. Set Heparin Parameters:
 - Touch the Heparin button
 - Confirm/Set the following Parameters:
 - Syringe type
 - Heparin rate (ml/hr); touch OK
 - Stop time in minutes; touch OK
 - Heparin Bolus amount (mL)

- f. Set Blood Pressure Monitor (BPM) parameters:
 - Touch the BPM button
 - Confirm/Set the following values:
 - Alarm limits
 - Interval (minutes apart)
 - Press OK

- g. Set BVM parameters:
 - Touch Option button then the BVM button.
 - Ensure BVM button is lit

- h. If patient using Ultrafiltration control mode on BVM screen:
 - Select adaptation of crit. RBV
 - Enter patient specific maximum BVM rate
 - Enter patient specific critical RBV

- i. Set BTM parameters:
 - Touch Option button then the BTM button.
 - Ensure that the recirculation test light (yellow) is lit.

- j. Set the UF parameters:
 - Touch the UF Menu
 - Confirm/Set the following values:
 - UF Time
 - UF Goal
 - Touch UF profile screen then select one of 4 profiles
 - Adjust starting UF rate with rocker switch prn
 - Press OK

- No change of the blood flow by more than 10 ml/min.
- Blood flow > 80 mL/min.
- Dialysate flow > 270 mL/min.

- The heparin rate cannot be set at less than 0.5 ml/hr. If the patient does not require heparin, do not attach a syringe to the line. Leave the heparin line clamped. Once dialysis is initiated a prompt to stop heparin will appear.
- Follow facility policy for administration and preparation of heparin.
- Refer to MRP Policy 30.10.20 *Administering a Heparin Bolus During Hemodialysis Treatment Using the Fresenius 5008 Heparin Pump* if a heparin bolus required after initiation of hemodialysis.

- UF control I/O cannot be programmed until UF goal is entered.

- Do NOT set the UF Goal until the patient has been assessed and a target fluid removal has been determined.

- The UF profile cannot be set until UF goal has been entered.
- If using both UF and Na+ profiles, they must be the same (e.g. both #1)

DOCUMENTATION:

- MRP Treatment Sheet
- Medication Administration Sheet (Dialysate and heparin)

REFERENCES:

Fresenius Medical Care: *5008 CorDiax ONLINEplus System; Simple, Safe, Cost-Effective*, 2015,
EQMO915028E-09/2015

Fresenius Medical Care: 5008 Hemodialysis System Operating Instructions: Software version: 4.01 Edition:
9/06.09 Part n.: M43 233 1