



**NEPHROLOGY PROGRAM  
DEPARTMENT POLICIES AND PROCEDURES**

**Hemodialysis - Section 10 - Gambro Artis - Neph 10-04  
Installing Gambro Artis with Portable Reverse Osmosis System outside of  
Dialysis Unit**

**No.: 00756** (TOH Standardized Policy Number)

---

**ISSUED BY:**

Hemodialysis Clinical Practice Committee

**DATE OF APPROVAL:**

N/A

**APPROVED BY:**

Program Clinical Director & Division Head

**LAST REVIEW/REVISION DATE:**

2017/10

**CATEGORY:**

Gambro Artis

**IMPLEMENTATION DATE:**

2011/10

---

**PURPOSE:**

- To install the Gambro Artis Hemodialysis machine and Gambro WRO300 Portable Reverse Osmosis (RO) unit outside of the dialysis unit

**BACKGROUND STATEMENTS:**

1. The Gambro RO and carbon tanks will be placed on a separate cart from the Hemodialysis machine
2. The Ottawa Hospital AquaCart will contain 2 carbon tanks, 2 filters in blue housing and a Gambro Portable Reverse Osmosis (RO)
3. The Gambro portable RO will be disinfected every 2 weeks by the Hemodialysis Technologist
4. The Serim Guardian Hi Sense test kit will be used to test for total chlorine (chloramine and free chlorine) in water used to prepare Dialysate
5. The designated "off unit" hemodialysis machines will be labeled "**Off Unit**" and fitted with a 15amp power cord
6. Only a Peracetic disinfect using Dialox may be done off unit unless there is access to a 20-amp plug (available in the **ICU only** and labelled Dialysis)
7. Hand Hygiene: As per Corporate Policies and Procedures Hand Hygiene [Hand Hygiene 00014](#)
8. Personal Protective Equipment: As per [Routine Practices 00023](#)

## **SUPPLIES:**

- 1 TOH AquaCart with GambroWRO300 Reverse Osmosis
- 1 Gambro Artis Hemodialysis machine
- 1 Bottle Serim Guardian HiSense Chloramine test strips
- 1 Bottle Reagent Solution
- 1 Standard drinking cup (Styrofoam\plastic)
- 1 Plastic dropper or 3 mL syringe
- 1 Bottle Serim Guardian Residual Peroxide test strips if testing for residual chemical
- 1 10 mL syringe if testing for residual chemical

## **DEFINITION(S):** N/A

## **NURSING ALERTS:**

1. If hemodialysis machine or RO is in a steady alarm state, discontinue the hemodialysis treatment and notify the On-Call Dialysis Technologist
2. HiSense Test Strips/Reagent Solution:
  - Do not allow the test strip to come in contact with liquids or with work surfaces which may be contaminated with interfering substances
  - Do not use the test materials in areas where vapours from containers of bleach or other oxidizing solutions may be present
  - Do not touch the reagent-containing Paper Flap on the test strip
  - Do not use the Test strips/Reagent Solution after their expiry dates
  - Keep the test strips in their original bottle
  - Replace the cap on the test strip bottle immediately and tightly after removing a strip; the strips must be protected from humidity and heat
  - Do not use the Serim HiSense reagent solution after the expiry date written on the bottle
  - The Serim HiSense test strips are to be used within 3 months after first opening the bottle. The expiry date will be verified on the bottle and the date opened will be written in the space provided on the bottle label

## **PROCEDURE:**

1. Transport Gambro Artis Dialysis machine and TOH AquaCart to area where patient is to be dialyzed.
2. Connect RO water inlet fitting to the appropriate water outlet. This will depend on the location of the installation. Special fittings, if needed are located in the technical work area.
3. Verify that:
  - the “Feed water hose” is connected to the RO inlet
  - the “product water hose” is connected to the Gambro Hemodialysis machine
  - The “drain hoses” for both the Dialysis machine and RO are connected to the proper drain location. If a sink is used, secure the drain lines with tape to prevent them from falling out of the sink
  - Adapters will need to be added to the drain hoses if draining into a sink (required if the off-unit location does not have quick-connect outlets)

4. Connect power supply cords for Gambro Artis dialysis machine and Gambro R.O. module to a **Red electrical outlet**. These are connected to emergency power in case of failure
5. Turn on incoming water valve to provide water to the R.O. unit.

**Note:** When connected to a sink tap, turn on **cold water only**

6. Verify the main switch, located on the back of the RO, is in the “ON” position. A green light on the front of the machine will be illuminated
7. Verify the pressure gauge on the front of the Aqua cart panel (labelled “*post regulator pressure*”) is reading >20psi
8. On the Gambro portable RO, press and hold the operation button (Center button) to put machine into ‘Run’ mode
9. Check “*pre-filter pressure*” gauge. It should read between 20-100 psi
10. Scroll down on the display screen to “*Last Chemical*”. The last chemical on the RO should be within the last 14 days
11. The Gambro Artis Dialysis machine may now be turned on
12. Note the date of the Last Disinfect Cycle. Press ‘Disinfect/Rinse Settings’ and verify that the last disinfection was completed within **48 hours** (there will be a completed date and time in the stop column)
  - If the last disinfect cycle was Heat, Clean Cart A or Clean Cart C, and greater than 48 hours has elapsed, then initiate another disinfect cycle. Only a Peracetic disinfect using Dialox may be done off unit (unless there is access to a 20 amp plug i.e. ICU only)
  - If the last disinfect cycle was Peracetic (i.e. Dialox) and greater than 48 hours has elapsed, then initiate another Disinfect cycle
  - If the last disinfect was Peracetic using Dialox, test for residual chemical before patient connection (step #18).
  - Ensure the Peracetic disinfectant has been disconnected from the back of the machine
13. Check the parameters on the front of the AquaCart Panel:
  - Scroll down on the display screen to “Product Water” (conductivity). It should be within limits (0- 20 us/cm)
  - Scroll down on the display screen to “Rejection”. The Percentage rejection rate should be above 90%
  - Scroll down on the display screen to “Product water temperature” the temp should read <30 C
  - If values mentioned above are not in range put machine into to rinse. This will allow for the water consumption to increase and rinse out any stagnation of water in plumbing carbon tanks and machine

**Note:** The alarm will sound if the product water and the percent rejection rate are out of range. Press alarm button to mute the alarm and contact the Dialysis technologist or replace the RO Aqua cart

14. Let the water run for ten minutes to ensure the carbon filters are well flushed
15. Test the carbon filters for presence of chlorine/chloramines using the Hisense test strips:
- Obtain a water sample from the sample port located on the front of the AquaCart Panel Labelled “*1st chloramine test*”. Fill the drinking cup x 2 and discard. The third sample will be tested for Chloramines
  - Check for expiry date on the test strip bottle. Remove one test strip from the bottle. Replace the lid promptly and tightly
  - Insert the test strip in the strip holder (with the paper facing up) until it meets the peg stop. Snap the strip holder closed
  - Remove a water sample from the medicine cup using the plastic dropper or clean syringe. Add the water sample drop-wise into the reservoir on the top of the test strip holder until the reservoir is just full (do not overfill)
  - Immediately add **1 drop** of Reagent Solution to the sample in the reservoir

**Note:** the addition of more than 2 drops of Reagent Solution will adversely affect the sensitivity of the test

16. When the water sample has drained from the reservoir (approximately 8 minutes), remove the strip from the holder and interpret the results:
- If the circular Reaction Zone is no darker than the rest of the Paper Flap, this is a negative result - the water has less than 0.1 ppm total chloramine and is considered safe for dialysis
  - If the circular Reaction Zone displays a distinct blue colour, darker than the surrounding Paper Flap, this is a positive result. Proceed to test from the 2nd carbon filter from the sample port on the front of the Aqua cart panel labeled “*2nd chloramines test*” If the second result is positive, the water should not be used to prepare the dialysate. It means that the water is over the CSA standard of 0.1ppm and therefore may cause hemolysis. **Contact a Dialysis Technologist**
  - If the second result is negative, proceed with the treatment and alert a Dialysis Technologist so the exhausted carbon filter can be replaced before the next treatment. Place a note on the back of the machine to alert other staff members that this machine has tested positive and has been used for a treatment
  - Never dialyze a patient on a system where the first carbon filter has tested positive for more than one (1) treatment

**Note:** the results from a HiSense test strip must be interpreted within 10 minutes after the sample has drained

17. Once the water readings are within the acceptable limits, proceed with the set-up of the hemodialysis machine as per procedure [Neph 10-01 \(#01160\)](#) Preparing the Gambro Artis for Hemodialysis"
18. If the last disinfect was Peracetic (Dialox), a message will appear on the Gambro Artis “**residual check reminder**”. A test for residual chemical must be done prior to connecting the patient to the machine:

- Obtain a fluid sample by attaching a 10 mL syringe to the sampling port on the red dialysis fluid tube, withdraw 10 mL then discard. Withdraw another 10 mL sample to check for residual chemical with a peroxide test strip.
- If the result is greater than 1 PPM, discard the primed circuit and put the machine through a rinse cycle (16 minutes). Repeat the residual testing, using a peroxide test strip. If the result is greater than 1PPM, change the Artis machine

**Note:** RO water temperature can be higher if the Artis Machine is in low consumption (the Dialysate flow rate is only 300ml/min). The temperature will begin to drop when taken out of low consumption

## **DOCUMENTATION:**

- Document on the paper Hemodialysis record (enter pre and post data in NephroCare)

## **RELATED POLICIES / LEGISLATION:**

1. Nephrology Policies and Procedures - [Hemodialysis - Section 10 - Gambro Artis - Neph 10-01 \(#01160\) Preparing the Gambro Artis Machine for Double Needle Hemodialysis](#)
2. Infection Prevention and Control Policies and Procedures - [Routine Practices 00023](#)
3. Corporate Policies and Procedures - [Hand Hygiene 00014](#)

## **REFERENCES:**

1. CAN/CSA-ISO 13959-11 Water for Hemodialysis and related therapies
2. Gambro Artis Service Manual, 2012 Version 8.06, Service code 6997860
3. Gambro Artis User Manual, 2012 Version 8.09
4. Gambro WRO 300 User Manual HCEN9939 Rev May2011
5. Serim Guardian HiSense Test Strips, Product Information Insert
6. Serim Guardian Residual Peroxide Test Strips, Product Information Insert
7. The Ottawa Hospital Biomedical Nephrology Technical Services (2012), Gambro Artis
8. Hemodialysis Equipment Chemical Disinfection Idle Time Validation Report

## **COMMENTS / SIGNIFICANT REVISIONS: N/A**