PROVINCIAL STANDARDS & GUIDELINES

BCRenal
Provincial Health Services Authority

Circle Protocol for Temporary Interruption of Dialysis

October 2018

Approved by the BC Renal Hemodialysis Committee

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IMPORTANT INFORMATION

This BC Renal guideline/resource was developed to support equitable, best practice care for patients with chronic kidney disease living in BC. The guideline/resource promotes standardized practices and is intended to assist renal programs in providing care that is reflected in quality patient outcome measurements. Based on the best information available at the time of publication, this guideline/resource relies on evidence and avoids opinion-based statements where possible; refer to www.bcrenalagency.ca for the most recent version.

For information about the use and referencing of BC Renal guidelines/resources, refer to http://bit.ly/28SFr4n.

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1.0 Scope of Guideline

This guideline applies to adults receiving hemodialysis (HD) and hemodiafiltration (HDF) in:

- In-centre (hospital-based) dialysis units.
- Community dialysis units (CDUs).

This guideline applies to Registered Nurses (RNs) and Licensed Practical Nurses (LPNs) who have completed the required hemodialysis specialty education per Health Authority Renal Program guidelines and who provide nursing care in a British Columbia in-centre or community dialysis unit.

The purpose of the guideline is to describe the procedure to temporarily interrupt a hemodialysis treatment to allow the patient to attend the bathroom or to use a commode at the bedside, when a bedpan is not available, tolerated or appropriate. This procedure is also used to temporarily interrupt dialysis to troubleshoot access problems or air in the extracorporeal circuit.

2.0 Recommendations

Recommendation #1: Implement a standardized procedure for temporary interruption of a hemodialysis treatment, taking into account machine-specific considerations, as described in Section 5.0 Procedure below.

3.0 Considerations

- **A common symptom of hypotension is an urgency or need to evacuate the bowels.** Patients often feel the urge to void or move their bowel due to abdominal cramping related to a hypovolemic state.
- Consider advising patients to empty their bladder or ostomy bag prior to the initiation of dialysis. Also consider asking patients during the treatment if they have any symptoms of hypotension such as dizziness, weakness, and/or visual disturbances.
- **Always check blood pressure and heart rate prior to allowing a patient to attend the bathroom or commode.**
- Ensure IV infusions into the extracorporeal circuit are stopped before initiating the circle procedure.
- Hypotensive or vasovagal episodes frequently occur in the bathroom. To prevent potential hypotensive episodes due to hypovolemia while attending the bathroom/commode, **the blood in the circuit must be returned to the patient** before initiating this procedure per machine-specific and program/unit guidelines (both arterial and venous sides of a patient's bloodlines).
- If the patient does not agree to blood reinfusion (after risks this would pose are explained), patient refusal must be documented. A sitting BP and HR must be assessed prior to transfer to the bathroom or commode.
- After bathroom attendance, it may be appropriate to adjust the patient's target weight.
- To reduce the risk of back filtration and blood circuit contamination, the **MAXIMUM TIME** that blood-tinged normal saline or substitution fluid can be circulated in the extracorporeal circuit is 30 **MINUTES**. After 30 minutes bloodlines **MUST** be discarded and replaced to continue treatment.
- To reduce excessive de-oxygenation of blood

and risk of clotting when troubleshooting access problems, the **MAXIMUM TIME** that blood can be circulated in the extracorporeal circuit is **15 MINUTES**.

- **If dialyzer, line(s) and/or entire system clots during temporary disconnect, replace as per guidelines and notify the nephrologist for orders as required.**
- Antimicrobial agents such as chlorhexidine 2% with 4% alcohol/sodium hypochlorite 0.11% solution require a friction scrub and must be allowed to air dry completely for maximum effectiveness.

4.0 Procedure

4.1 Equipment/Materials

AV fistula/graft (AVF/AVG)

- PPE – Face shield or goggles and mask, and gown or apron.
- 2 pairs clean gloves (non-sterile).
- 2 10mL normal saline prefilled syringes.
- Clean drape.
- 4x4 sterile gauze.
- Approved antimicrobial cleansing agent.
- Paper tape.
- Sterile recirculation adaptor/ connector.
- Biohazard waste bag.

Hemodialysis Central Venous Catheter (CVC)

- PPE – Face shield or goggles and mask, and gown or apron.
- Patient mask (without Tego).
- 2 pairs clean gloves (with Tego)/ sterile gloves (without Tego) – unit-specific.
- 2 20mL normal saline prefilled syringes or
- 4 10mL normal saline prefilled syringes.
- Clean drape (with Tego) or
- Sterile dressing tray (without Tego).
- Approved antimicrobial cleansing agent.
- Tape.
- Sterile recirculation adaptor/ connector.
- Biohazard waste bag.

4.2 Procedure

4.2.1 Suspending Treatment – Generic

STEPS	RATIONALE
1. Check vital signs (BP and HR) and record machine parameters.	Record baseline data before initiating the procedure and ensure the patient is stable.
2. For bathroom/commode attendance, return patient's blood per machine-specific and program/unit guidelines (both arterial and venous sides of patient's bloodlines). Not required for access troubleshooting.	To decrease risk of hypotensive episode due to hypovolemia.
3. Perform hand hygiene and apply appropriate PPE for vascular access.	Reduce transmission of microorganisms.
4. Stop blood pump. Clamp arterial and venous bloodlines, and arterial and venous fistula needles or catheter lumens.	
5. Per program/unit guidelines, prepare for temporary termination of dialysis.	
6. Disconnect arterial bloodline from fistula needle or CVC lumen and connect to sterile recirculation device.	Recirculation connector device connects bloodlines to allow bloodline circuit integrity while patient is temporarily disconnected.
7. Attach normal saline syringe to fistula needle or CVC lumen, flush and clamp.	Ensure patency of access.
8. Repeat Steps 6 and 7 on venous bloodline.	
9. Secure syringes attached to AVF/AVG needles or CVC lumens.	To prevent access dislodgement while temporarily disconnected from hemodialysis machine.
10. Check patient's sitting BP and HR after reinfusion and document.	To ensure patient's stability.
11. Unclamp machine arterial and venous bloodlines.	
12. Follow specific hemodialysis machine sequence to temporarily halt dialysis process.	Follow program/vendor-specific procedures.
13. Turn on blood pump to machine default (see machine-specific considerations below).	Maintain circuit integrity and prevent back filtration of dialysate into the blood path.
14. Remove PPE and perform hand hygiene.	

4.2.2 Resuming Treatment – Generic

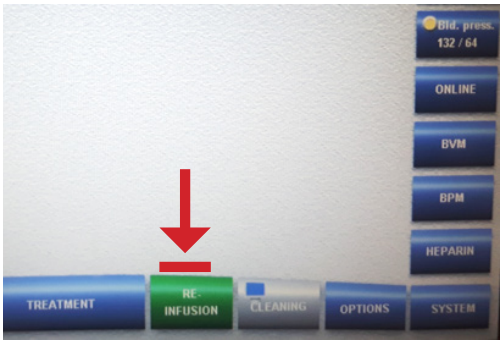
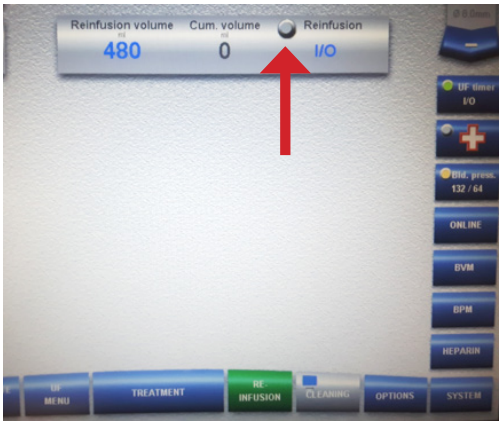
STEPS	RATIONALE
15. Consider having patient re-weigh on return from bathroom.	This information will help you reassess the UF goal.
16. Perform hand hygiene and apply appropriate PPE for vascular access.	Reduce transmission of microorganisms.
17. Stop blood pump. If using normal saline, clamp IV line and arterial and venous bloodlines.	
18. Per program/unit guidelines, prepare access to resume dialysis.	Check patency of access and follow unit policy if access is not patent.
19. Reconnect bloodlines to access per program/unit guidelines.	
20. Remove PPE and perform hand hygiene.	
21. Start blood pump per program/unit guidelines for commencing dialysis treatment. Gradually increase blood pump speed as arterial and venous pressure allows.	
22. Resume dialysis as per hemodialysis machine-specific sequence.	Follow program/vendor-specific procedures.
23. As necessary, reprogram total weight loss to include extra normal saline or substitution fluid rinse back and/or fluid loss.	To accurately calculate fluid loss.
24. Disinfect contact area of hemodialysis machine with unit-specific disinfectant post procedure.	Reduce cross contamination of micro-organisms and blood borne pathogens.
25. Record vital signs and patient's tolerance of procedure and machine parameters.	

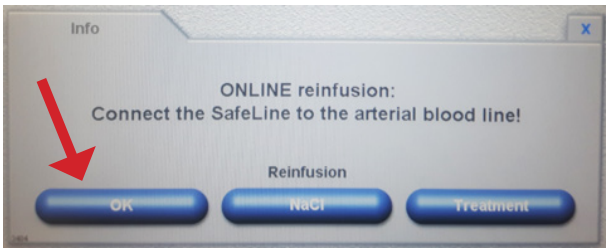
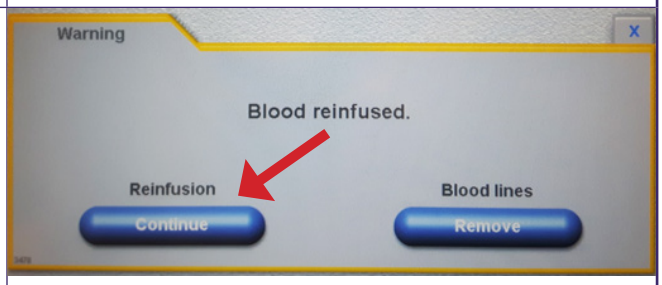
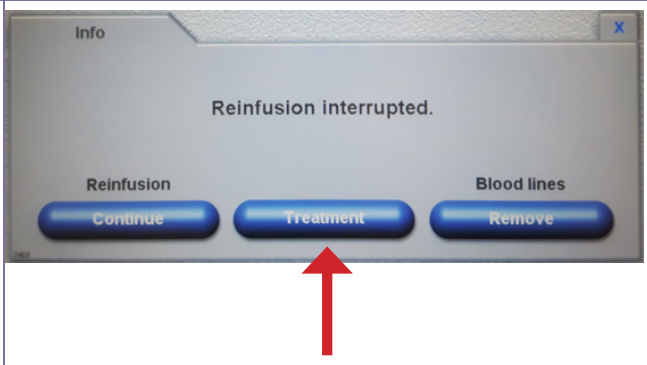
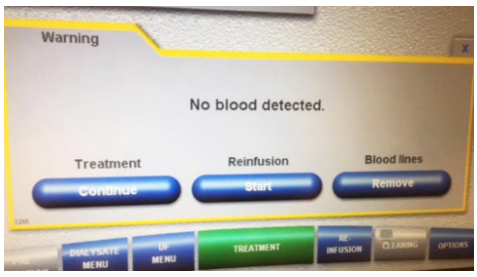
4.3 Machine-Specific Considerations

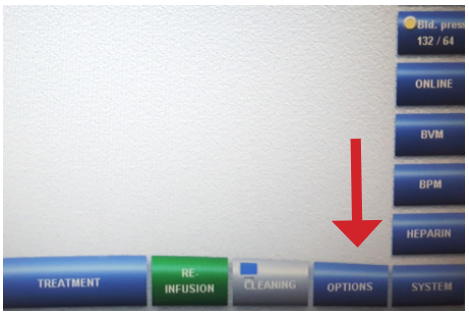
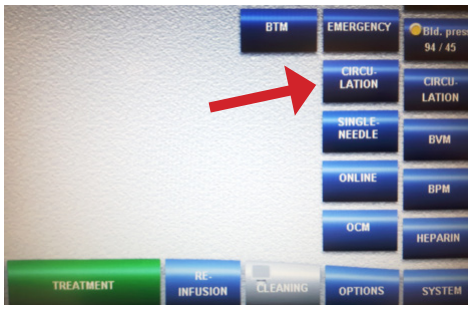
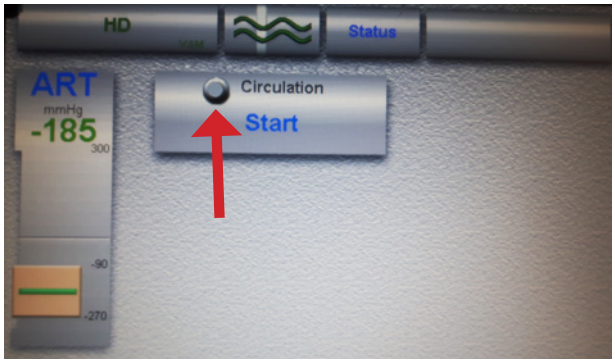
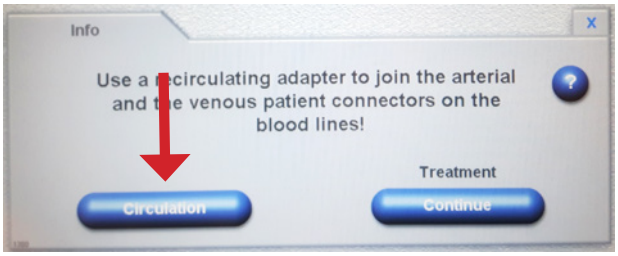
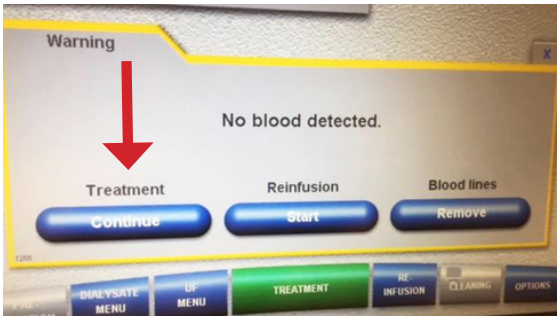
4.3.1 Fresenius – Fresenius 5008 CorDiax

- The UF will automatically adjust to 0 while in recirculation. Do not adjust.
- The saline must be clamped while in recirculation.
- The machine will notify you every 10 minutes while in “circle”.

Step-by-Step 5008 CorDiax Dialysis Interruption Guide

STEPS	VISUAL GUIDE
1. Treatment screen. • Select “Reinfusion”.	
2. Select “Reinfusion” button. • Ensure you have clamped arterial access and bloodline.	
3. Reinfusion. • Use connector to attach arterial line to substitution fluid line, applying dead-end cap to arterial one-way valve to preserve sterility. Open arterial bloodline clamp. *NOTE: If choosing to reinfuse via saline or when using a machine not set up to use ONLINE substitution fluid, a primed saline IV is required with a minimum of 400mL of NS available for reinfusion. Select “Reinfusion: NaCL”. The machine will message*	

"Connect a NaCL solution" Ensure a primed saline line with a y-port is connected to the arterial medication line. • Select "OK". • Reinfuse at machine default speed until pump stops	
4. Pump stops when no blood detected OR reinfusion volume reached. Message on screen "Blood reinfuzed". • Select "Reinfusion Continue". If stopped by pressing Reinfusion button off manually, go to Step 6.	
5. Once reinfusions starts, allow a minimum of 30mL additional volume to reinfuse (allowing for arterial pressure to normalize), then either stop the blood pump, or select "Reinfusion: I/O" to stop reinfusion. • Clamp venous access and bloodline.	
6. Message "Reinfusion interrupted". *NOTE: If ONLINE primed machine, disconnect substitution fluid line from connector, remove cap from one-way valve, and reattach to bloodline connection.* • Attach arterial and venous line with connector, and open bloodline clamps. *NOTE: If using normal saline, clamp normal saline line, and cap port.* • Select "Treatment".	
7. Message "No blood detected". • Use "x" in top right corner of prompt to temporarily park message.	

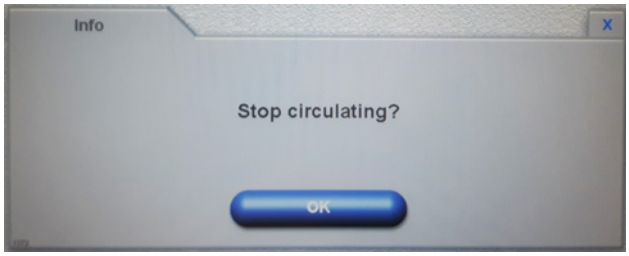
8. Select “Options” tab at bottom of screen.	
9. Select “Circulation” tab.	
10. Once “Start” wording turns from grey to blue, select “Circulation Start”. • Turn on blood pump.	
11. Arterial and venous lines will already be attached. • Select “Circulation”.	
12. Re-open previously parked message, and select “Treatment Continue”.	

13. Circulation begins.

This screen appears while patient is off machine.

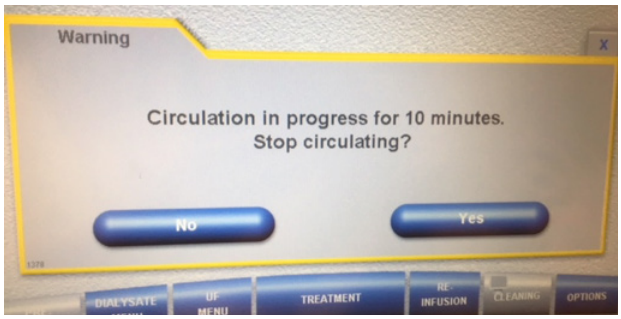
The “OK” button can be selected at any time during circulation, when the patient returns. When selected move to Step 16.

NOTE: Every 5 minutes while in circulation with little to no blood in lines the machine will re-alert the prompt from step 12. Continue to re-select “Treatment Continue”.



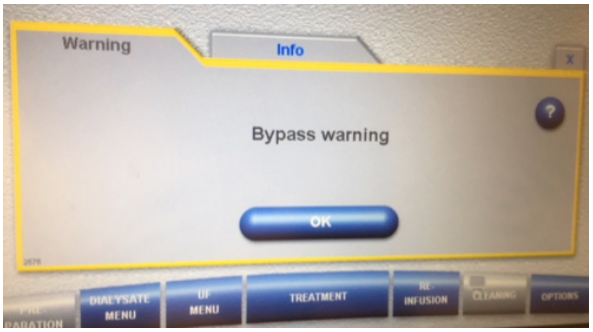
14. After 10 minutes, there will be a warning to stop circulating with options “No” or “Yes”.
    - If patient is ready to re-initiate dialysis, select “Yes” and move on to step 16. Otherwise, select “No”.
    - If “No” is selected, the same “No blood detected” alarm from Step 12 will reappear. Re-select “Treatment Continue”.

The warning shown to the right will re-appear after 10 min, and will appear a total of 2 times.



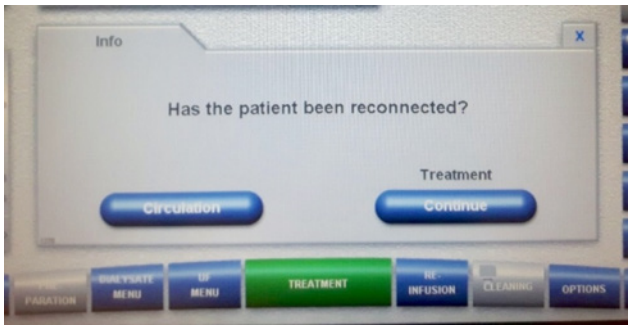
15. After second 10-minute warning, bypass warning message.
    - Select “OK”.

NOTE: If patient is still not ready to re-initiate dialysis at this time, lines should be discarded and machine re-strung.



16. Re-connect arterial and venous bloodlines to patient according to guidelines.
    - Select “Treatment Continue”.

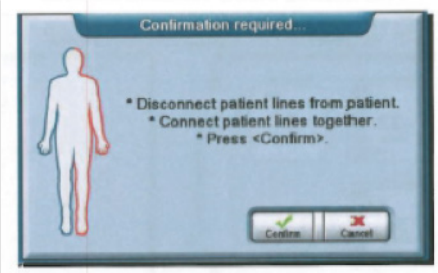
Please ensure:
- UF timer on.
- BP on.



4.3.2 Gambro – Artis

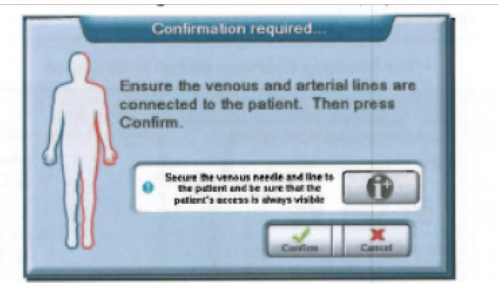
To disconnect:

- Slow pump down to 100mL/min.
- Open saline.
- Clamp arterial line with blue clamp below chamber.
- Let blood rinse back as clear as possible, then:
  1. Press **Special Procedures.**
  2. Press **Pause Treatment** – the pump will stop and the confirmation required screen will come up:
     - ✓ Clamp the bloodlines and patient access.
     - ✓ Flush each access with 10mL normal saline.
     - ✓ Attach bloodlines to recirculation device.
  3. Press **Confirm** button – patient can go to washroom:
     - ✓ Unclamp blood lines.
     - ✓ Press blood pump button (pump will restart at 100mL/min).
     - ✓ Circuit is in "circle".



When ready to reconnect:

1. Press **Reconnect Patient:**
   - Blood pump will stop.
   - Confirm window is displayed.
   - Clamp bloodlines and reconnect the patient.
2. Press **Confirm:**
   - Restart the blood pump.
3. Press **Resume Treatment:**
   - Adjust pump speed, all parameters will resume.



4.3.3 BBraun – Dialog+

- The saline must be clamped while in recirculation.

Steps to return blood:

1. Touch Red Man icon to initiate blood return.
2. Clamp arterial line and patient's arterial access.
3. Disconnect arterial line from the patient.
4. Connect arterial line to the y-port of the saline line.
5. Flush the patient's arterial access.
6. Unclamp saline line clamps (upper and lower clamps) and arterial line.
7. Press Confirm key to start reinfusion. Pump will stop after 400mL has been infused.
8. Clamp arterial line and saline line clamps.
9. Disconnect arterial line from the y-port of the saline line.
10. Connect a red or yellow dead-ender cap to the saline line.
11. Connect the arterial line to a recirculation device.
12. Clamp venous line and patient's venous access.
13. Disconnect venous line from the patient.
14. Connect venous line to the other end of the recirculation device.
15. Flush the patient's venous access.
16. Unclamp the arterial and venous lines.
17. Set the pump speed to 150mL/min and start the pump.

4.4 Documentation

- Document the reason for the temporary interruption of dialysis treatment and the approximate amount of time the patient was in "circle" on the appropriate unit-specific health record.
- Document vital signs, machine parameters, patient response, access status, and interventions on the unit-specific health record.

5.0 Definitions and Abbreviations

- AVF – Arteriovenous fistula
- AVG – Arteriovenous graft
- BM – Bowel movement
- BP – Blood pressure
- "Circle" – Recirculation of extracorporeal circuit
- CVAD – Central venous access device
- CVC – Central venous catheter
- HR – Heart rate
- IV - Intravenous
- NHD – Nocturnal hemodialysis
- NS – Normal saline
- PPE – Personal protective equipment
- TCC – Tunneled cuffed catheter
- TDC – Temporary dialysis catheter
- UF – Ultrafiltration
- UFR – Ultrafiltration rate

6.0 References

BC Health Authority guidelines used in the development of this guideline:

- Island Health – Reinfusion and Recirculation for Bathroom Attendance (April 2017).
- Vancouver Coastal Health – Hemodialysis: Circle Protocol for Temporary Interruption of Dialysis (No date).

BC Renal Agency guidelines used in the development of this guideline:

- BC Renal Central Venous Catheter (CVC):

Discontinuance of Dialysis; Approved August 15, 2011; Revised December 16, 2011, and June 17, 2012.
- BC Renal Central Venous Catheter (CVC): Initiation of Dialysis; Approved August 15, 2011.

External sources used in the development of this guideline:

- Canadian Agency for Drugs and Technologies in Health. CADTH Rapid Response Report: Reference List. Temporary Interruption of Hemodialysis: Safety and Guidelines. April 9, 2018.
- Manitoba Renal Program. Fresenius 5008 Recirculation of Extracorporeal Circuit with Normal Saline and with Blood. Effective date – November 2012. Revision date – January 2016.

7.0 Sponsors

This BC Renal guideline/resource was developed to support equitable, best practice care for patients with chronic kidney disease living in BC. The guideline/resource promotes standardized practices and is intended to assist renal programs in providing care that is reflected in quality patient outcome measurements. Based on the best information available at the time of publication, this guideline/resource relies on evidence and avoids opinion-based statements where possible; refer to www.bcrenalagency.ca for the most recent version.

Developed by:

- A working group of Renal Nurse Educators

Reviewed by:

- BC Renal Hemodialysis Committee – June 21, 2018

Approved by:

- BC Renal Hemodialysis Committee – June 21, 2018
- BC Renal Medical Advisory Committee – June 22, 2018