The Ottawa Hospital | L'Hôpital d'Ottawa

NEPHROLOGY PROGRAM
DEPARTMENT POLICIES AND PROCEDURES

Nephrology - Section 01 - Nephrology Corporate - Neph Corp 1-01
Peritoneal Dialysis (PD) Catheter Care
No.: 01492 (TOH Standardized Policy Number)

ISSUED BY:
Home Dialysis Clinical Practice Committee / Hemodialysis Clinical Practice Committee

DATE OF APPROVAL:
2015/06

APPROVED BY:
Program Clinical Director and Division Head

LAST REVIEW/REVISION DATE:
2015/07

CATEGORY:
Nephrology Corporate

IMPLEMENTATION DATE:
2015/06

POLICY STATEMENT:

- Peritoneal Dialysis (PD) catheter care may only be performed by the Registered Nurse (RN)/Registered Practical Nurse (RPN) who has the associated knowledge, skill and judgement. Nurses must attend an educational session(s) provided by the Nurse Educator/ delegate or the Home Dialysis Unit (HDU) nurse to perform PD catheter care. Nurses on 7NW, HDU and Nurses educated for PD care in the Hemodialysis Units and Rehab centre will follow specific physician orders or appropriate Medical Directives

This policy addresses the following PD catheter related procedures:

- PD catheter occlusive dressing change
- peritoneal flushes using twin bag system followed by heparinization and capping of the catheter
- heparinization of PD catheter without flush
- draining of the abdominal cavity

Catheter flushes and instillations are ordered by the Nephrologist and must specify:

- the number and frequency of flushes
- type of solution, concentration and volume to be used
- any medications to be added to the solutions or instilled into the catheter

Guidelines for PD catheter exit site care:

- Immediately post insertion of a PD catheter, it is important to leave the initial dressing in place for 1 week as immobilization of the catheter is vital to promote healing. If the initial dressing becomes wet with blood, fluid or exudate, the dressing should be changed prior to the 1 week mark
- Post op and post exteriorization care includes keeping the dressing dry and minimizing movement of the catheter. Instruct patient not to shower or bath until the exit site is well healed and to avoid any tugging on the catheter
- Chlorhexidine should be used as cleansing solutions while the exit site is healing as Povidone Iodine and Peroxide may cause epithelial toxicity
- After exit site has healed, use of Chlorhexidine should be avoided when possible related to risk of Encapsulating Peritoneal Sclerosis. However, Occlusive dressings for admitted patients will continue to use Chlorhexidine. Transfer set changes and alternate cleansing methods should be done with Povidone-Iodine
- Prophylactic Mupirocin or Gentamicin cream at the exit site has been shown to reduce risk of infection. The antibiotic cream should be 'painted' thinly on the skin around the exit site using cotton tip applicator or folded gauze and not applied directly to the exit site
- The patient should be instructed not to take a bath. Immersing the catheter and exit site in bath water may lead to exit site infection and peritonitis

Infection Prevention and Control:

Hand Hygiene:

1. Refer to Corporate Policies and Procedures - #00014 Hand Hygiene
2. Refer to Corporate Policies and Procedures - #00233 Hand Hygiene Products and Materials

Before initial patient/patient environment contact
Before an aseptic procedure
After body fluid exposure risk
After patient/patient environment contact

Personal Protective Equipment:

1. Refer to Infection Prevention and Control Policies and Procedures - #00023 Routine Practices

DEFINITION(S):

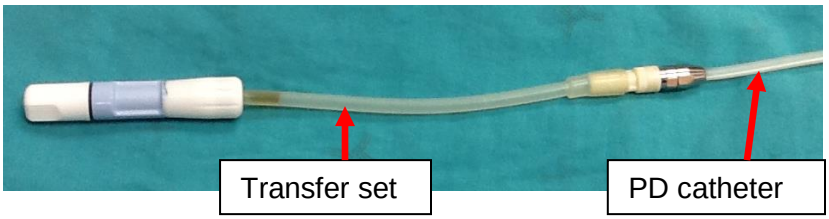
1. **Peritoneal Dialysis (PD) catheter** – is a soft silicone or polyurethane tube which is inserted into the abdominal cavity. It commonly has 1 or 2 Dacron cuffs (similar to a tunnelled CVAD catheter) which serve:

   - to stabilize/secure the catheter in place
   - as a barrier against the movement of microorganisms along the tunnel
   - to prevent leaks

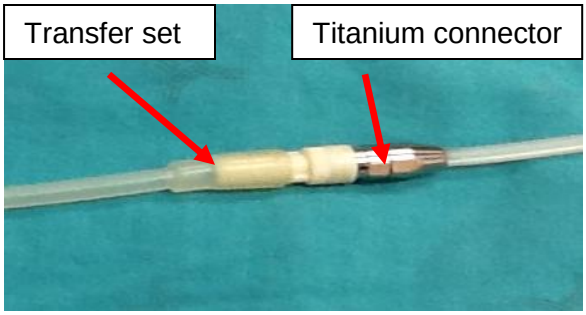
   The external end of the catheter has a titanium or resin connector on it. The internal end has numerous holes and is ideally situated low in the peritoneal cavity

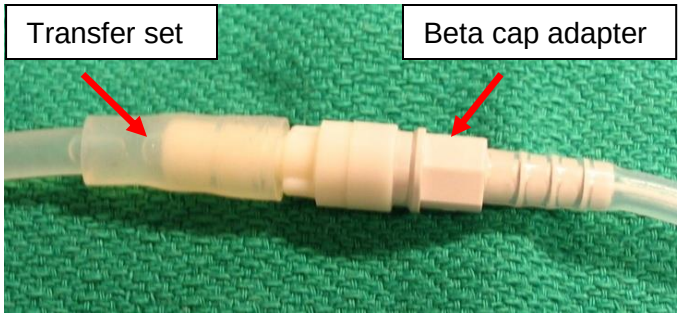
2. **Transfer set** – is a piece of tubing which is attached at one end to the titanium connector or Beta cap adaptor (resin connector), see figure 1. The other end has a twist clamp which opens and closes to allow the flow of fluid through the catheter. When the catheter is not being used, this end is always protected with a mini-cap which has a small Providone-iodine sponge inside

Figure 1



Titanium connector **Beta cap adaptor**





3. **Peritoneal Dialysis catheter dressing** – an occlusive transparent dressing which covers the PD catheter and the titanium or Beta cap adapt (resin connector)

4. **Peritonitis** – an inflammation of the peritoneum commonly produced by bacteria. Peritonitis may occur as the result of poor technique (contamination), an exit site infection, tunnel infection, or movement of bacteria through the bowel or bloodstream. Typical signs and symptoms include abdominal pain (50% with rebound tenderness), cloudy effluent, fever & chills, nausea, vomiting or diarrhoea

5. **Peritoneal Dialysis flushes** – the instillation and immediate drainage of warm peritoneal dialysis solution via the PD catheter. The flushes are performed for the newly inserted PD catheter to maintain its patency, or in order to remove blood, fibrin and/or cloudy effluent from the catheter or the peritoneal cavity. Heparin may be ordered to be added to this solution

6. **Peritoneal Dialysis catheter heparinization** – Heparin (an anticoagulant) is instilled into the PD catheter to maintain the catheter patency when it is not in use

7. **Peritoneal Dialysis cycler** – a medical device that performs peritoneal dialysis solutions exchanges in regular cycles. A cycler (Baxter HomeChoice) is programmed to drain, instil warmed dialysate solution and allow timed dwells of the dialysate

ALERTS:

1. For concerns or questions related to peritoneal dialysis and/or dressing: consult the Riverside Home Dialysis Unit (88193), 7NW General Campus (78698) or the Civic Hemodialysis Unit (14946)

2. Supplies should be placed on a freshly cleansed surface. Cleanse the over bed table with hospital grade cleanser prior to beginning these procedures

3. PD solution bags should be warmed to 35°-37°C shortly before use, using a dry heat method, e.g. PD solution warmer or on the heater portion of a PD cycler. The solution bag should be tepid to the touch

   - **NEVER** use a microwave to warm the solution
   - **NEVER** immerse in water
   - **NEVER** use PD solutions if in warmer for more than **7 days**

   i. Any contamination of the PD system may lead to peritonitis. The end of the transfer set should never be set down unless there is a cap/syringe/tubing attached to it.

   ii. In the event of an accidental touch contamination of the end of the transfer set while the twist clamp is closed (also known as dry contamination):

      - apply a new Minicap to the transfer set
      - leave it on for 15 minutes
      - Proceed with the procedure using new supplies.

   iii. In the event of an accidental disconnection between the end of the transfer set and the PD tubing and fluid has spilled out (also known as wet contamination):

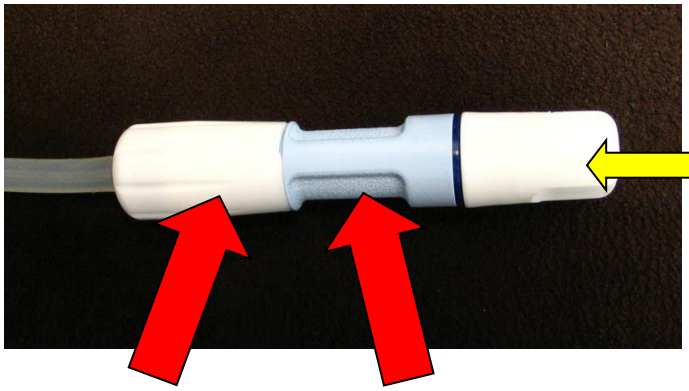
      - apply gloves
      - close the clamp on the transfer set (if clamp is open and/or fluid is leaking out)
      - immediately apply a new Minicap
      - notify the HDU and the Nephrologist
      - the transfer set should be changed by a PD trained nurse prior to the next use and prophylactic antibiotics may be ordered by the Nephrologist

   iv. In the event of an accidental disconnection occurring between the titanium or resin connector and the transfer set:

      - clamp the PD catheter using a toothless clamp wrap the exposed end with sterile gauze
      - notify the HDU and the Nephrologist
      - the transfer set will need to be changed by a PD trained nurse prior to the next use and prophylactic antibiotics may be ordered by the Nephrologist

4. When opening and closing the twist clamp of the transfer set, hold the light blue (middle) portion steady and twist the white twist clamp. See Figure 2

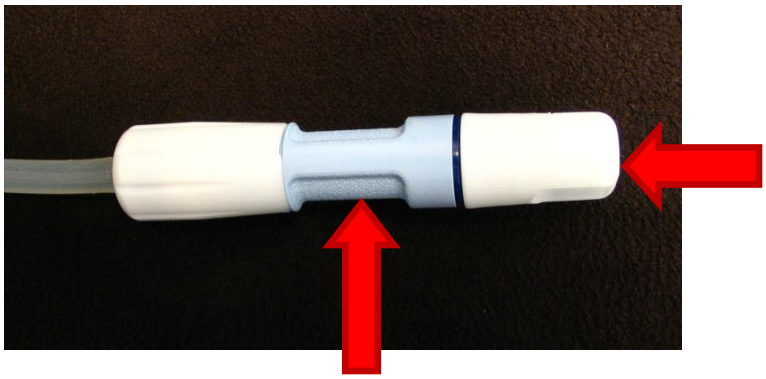
Figure 2



Twist white portion (clamp) Hold blue portion steady

5. When connecting and disconnecting from the transfer set, hold the light blue part of the twist clamp steady and twist the Minicap or syringe or tubing on or off the transfer set. This is to prevent twisting of the catheter. See figure 3

Figure 3



Hold blue portion steady

6. Drainage of the peritoneal cavity may be required prior to thoracic or abdominal surgery or other procedures as ordered by Nephrologist (or as per HDU Medical Directive 1-02)

7. Use cytotoxic precautions if applicable for connection, disconnection and handling of effluent

8. All nurses caring for a patient with a PD catheter are responsible to:

- assess that the PD catheter dressing is dry and occlusive q shift and prn
- observe for and report signs and symptoms of peritonitis and exit site infection
- if peritonitis or exit site infection is suspected, contact the Nephrologist

9. A mask must be worn during dressing changes. The mask requirement during dressing change respects both the immunosuppression and the staphylococcus aureus nasal carrier susceptibility of the hemodialysis patient population. Masks are not necessary when connecting and disconnecting unless the patient or nurse has a cold\cough

10. An occlusive dressing is to be used:

- on all admitted PD patients (to prevent risk of nosocomial infection)
- post PD catheter insertion, where the catheter is not embedded until the exit site is healed for approximately 6-8 weeks (to immobilize the catheter and protect the exit site)
- post externalization of an embedded catheter until the exit site is healed
- apply Mupirocin cream sparingly around the exit site with each dressing change

11. A shower technique dressing or modified dressing is taught to patients by the HDU and is only to be performed at home. If patient refuses occlusive dressing after receiving education about rationale:

- Notify Nephrologist to discuss risks of infection and possibility of alternate arrangements
- Document in the progress notes

Section A: Occlusive dressing change

Equipment:

Quantity	Product	Order #
1	Bottle of CHG 2% aqueous solution in 4% alcohol OR	230265
2-3	Swabstick, CHG 2%, alcohol free 10% OR	230865
1	Bottle of 10% proviodine,1% free iodine solution (if allergic to CHG)	230380
1	Disposable major dressing tray	213010
1	Sterile cotton tip applicator (if major dressing tray is not available on the unit)	211640
1	Pair Non-sterile gloves	
1	Pair Sterile gloves	
1	Procedure mask	
2-3	Dressing Tegaderm transparent,10 x 12cm (4 x 5")	210365
1	Dressing IV 3000 ported transparent 9 x 12 cm	210335
1	Immobilizer	211100
1	Mupirocin 2% cream tube	

PROCEDURE:

1. Cleanse work surface with hospital grade cleanser, explain procedure to patient

2. Don mask, open sterile tray, adds supplies and cleansing solution

3. Don non-sterile gloves
4. Remove old dressing
5. If gauze remains around the catheter, remove using the forceps from tray. Discard gauze and forceps
6. Inspect catheter and exit site. Remove non-sterile gloves
    - If presence of exudate and/or erythema extending >13mm from exit site, swab for C&S (if not already done) and notify the Nephrologist
7. Don sterile gloves
8. Place 1 sterile drape to create a sterile field
9. Reserve 3 dry 10x10 cm gauzes: 2 to wrap the catheter later in the procedure and 1 to handle catheter during cleansing. Wet the remaining gauzes with Chlorhexidine, squeeze out excess fluid and separate gauzes on tray
10. Grasp transfer set tubing with dry sterile 10 cm x 10 cm gauze, elevating slightly to permit cleaning of the exit site and abdomen. Do not tug or pull on the catheter. Do not lay the catheter down until the cleaning is completed (steps 11-15)
11. Clean exit site with cotton tip applicators soaked with Chlorhexidine. Do not forcibly remove scab or crust
12. Using forceps and gauze moistened with Chlorhexidine, clean skin surrounding catheter, starting from the exit site moving outwards in a circular motion, then discard gauze. Repeat x1. Ensure all skin that will be covered by the dressing is cleansed
13. Using a chlorhexidine soaked 10cm x 10cm gauze, start from the exit site, and clean half way up the peritoneal catheter taking care not to put tension on catheter
14. Using a chlorhexidine soaked 10cm x 10cm gauze, clean the other half of the catheter starting with the titanium or resin connector working down the catheter
15. Using a Chlorhexidine soaked 10cm x 10cm gauze; clean the titanium or resin connector and work halfway up the transfer set tubing
16. Place the second sterile drape and lay the catheter down on it to air dry
17. Apply Mupirocin cream on folded 5cm x 5cm gauze; apply the gauze with cream around exit site of PD catheter
18. Open one dry 10cm x 10cm gauze, fold in half lengthwise and wrap around the catheter. Ensure that this gauze covers the exit site and the titanium or resin connector
19. Open a second dry 10cm x10cm gauze, fold lengthwise and place on top of the gauze wrapped catheter (this is to prevent the transparent dressing from sticking to the gauze wrapped around the catheter and to facilitate removal with next dressing change). Ensure that the catheter is placed on the abdomen in such a way that there is no tension on the exit site
20. Apply TEGADERM transparent dressings (10 x12 cm) to cover the gauze wrapped catheter, including the exit site and titanium or resin connector

21. Using the IV 3000 ported dressing, reinforce the edge of the transparent dressing (where the transfer set emerges from the dressing) using the slit technique. See figure 3 for slit technique and figure 4 for final dressing

Figure 3: Slit Technique

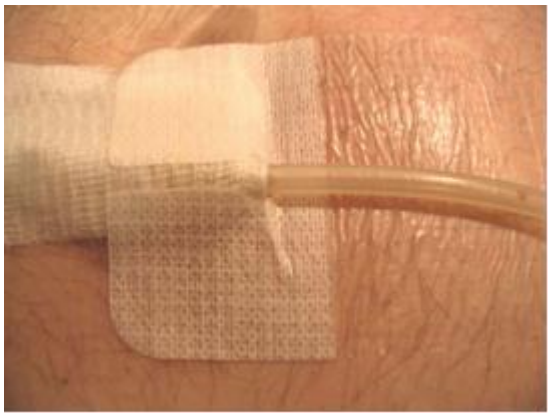
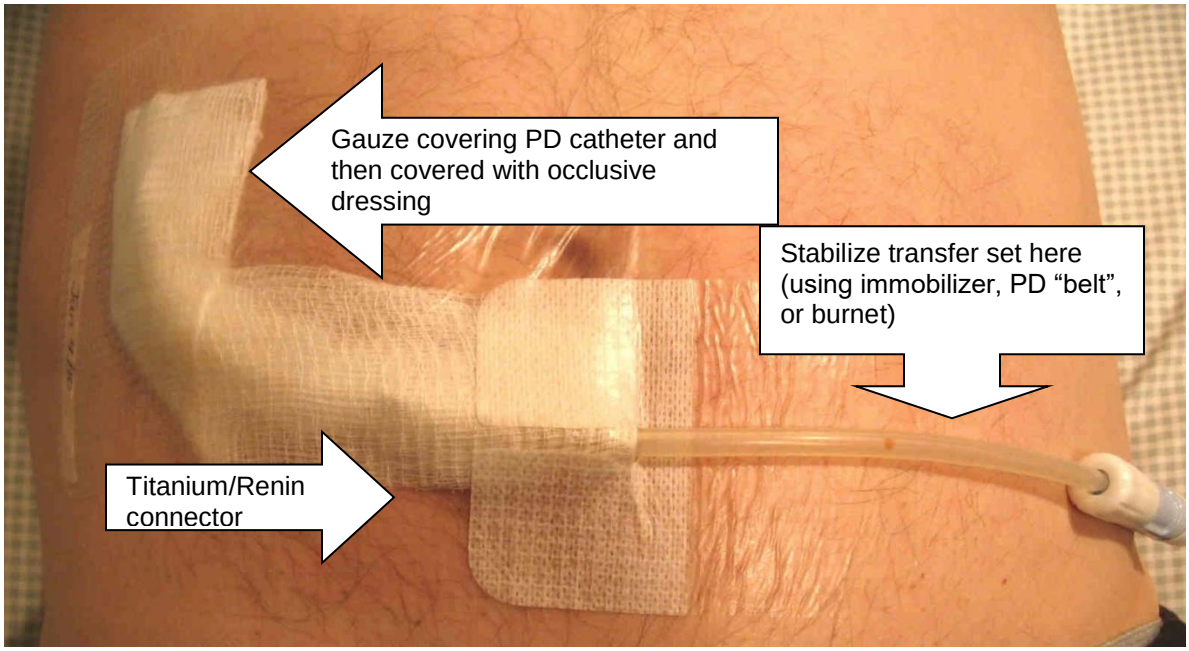


Figure 4: Final Dressing



22. Ensure that the transfer set is stabilized on the patient's abdomen using an immobilizer, the patients PD 'belt' or Burnet. Do NOT apply tape directly on the transfer set

Section B: Peritoneal flush using twin bag system followed by Heparinization and capping of the catheter

Equipment:

Quantity	Product	Order #
1	Non-sterile gloves	
1	Procedure mask	
1	Non-sterile towel (plastic disposable)	220525
2	Blue PD clamps	320680
	1- 2 Liter bag of warmed Twin Bag PD solution and volume as ordered	
2	Minicaps	320810
1	Fish scale (if measuring of fluid volume required e.g. Small fill volumes)	
1	IV pole	

If Heparin is ordered:	
Into the PD solution • 3 ml syringe • 18 g blunt fill needle • 2 alcohol swabs • Medication label • Heparin 1000 units/ ml	Into the catheter (lock) • 10 ml syringe • 18 g blunt fill needle • 1 alcohol swab • Medication label • Heparin 1000 units / ml

PROCEDURE:

1. Draw up Heparin (1000 unit/ml) as ordered using a 18 gauge blunt fill needle
   - If the Nephrologist has ordered a heparin instillation to the catheter (lock). Use a 10 ml syringe and draw up 7ml Heparin (1000 unit/ml)
   - Use a 3 ml syringe for heparin to add to the PD solution (500units/liter)
   - Apply medication labels to the syringes
   - Take syringes to bedside
2. Clean work surface with germicidal wipes prior to placing supplies on it, explain procedure to patient
3. Gather supplies and check expiry dates
4. Inspect the outer bag of warmed PD solution for damage and expiratory date. Warm PD solution expires after 7 days. If damaged or expired, do NOT use
5. Remove the outer plastic wrap. Once this wrap is removed, the solution must be used within 24 hours
6. Peel the empty drainage bag from the full bag of PD solution and place beside the full bag. Check the bag for:
   - correct solution (Dianeal vs Physioneal/Extraneal/Nutrineal)
   - volume, strength
   - expiry date
   - leaks (squeeze the bag)
   - clarity of solution
   - that protective pull ring and the injection port are intact

7. Hold the end of the tubing, uncoil the tubing and place the end under the full bag of PD solution. Check that the seal (frangible) is intact
8. If the Nephrologist has ordered heparin to be added to the PD solution, cleanse the injection port of the PD solution with an alcohol swab and inject Heparin. Apply medication label to the bag
9. Don non-sterile gloves. If patient or nurse has cold, or cough, a mask is required
10. Position the patient and expose the transfer set
11. Verify that the twist clamp on the transfer set is closed
12. Place the clean towel under the transfer set
13. Loosen the Minicap on the transfer set ¼ turn but do not remove cap, and place on clean towel
14. Pick up the Twin Bag tubing in your dominant hand (holding the tubing between your knuckles with the end facing out, leaves your fingers free to manipulate the mini-cap)
15. Remove the protective pull ring from the twin bag, drop it onto clean towel; take care not to contaminate the exposed end of the transfer set
16. While holding the Twin Bag tubing in your dominant hand, pick up the transfer set with other hand, and remove the Minicap from the transfer set with free fingers of dominant hand. Drop used Minicap onto clean towel and connects the Twin Bag tubing to the transfer set (see figure 5). Twist the tubing of the Twin Bag, not the transfer set

Figure 5

17. Place the drain bag on a clean surface lower than the patient's abdomen
18. Open the twist clamp on the transfer set and drains any residual PD solution from the peritoneal cavity (the output should correlate if the patient is empty or full)
19. When drainage is complete, close the twist clamp on the transfer set
20. Place a blue clamp on the drain line
21. Break the seal on the inflow line

22. With the new bag of PD solution still on the work surface, release the clamp on the drain line for 5 seconds to allow the PD solution to flush the air from the tubing into the drain bag (about 100 ml of PD solution should flush through)

23. Clamp the drain line with a blue clamp

24. Hang the warm PD solution bag on the IV pole or PD hook higher than the patient's abdomen

25. Verify that the fill line is free of air

26. Open the twist clamp on the transfer set. Allow the ordered amount of PD solution to infuse

27. Once the ordered amount of PD solution is infused (a fish scale may be used to measure accurate amounts of solution), close the twist clamp on the transfer set and clamp the inflow line with a blue clamp (**If you are performing an exchange, proceed directly to step #32**)

28. Remove the blue clamp from the drain line, open the twist clamp on the transfer set and allow the effluent to drain

29. Inspect the effluent for volume, clarity and presence of fibrin or blood. If the effluent is cloudy, notify the Nephrologist

30. If doing multiple flushes from the same PD solution bag:

- Close the twist clamp
- Clamp the drain line
- Remove the blue clamp from the inflow line
- Open the twist clamp
- Allow the ordered volume of solution to infuse
- Close the twist clamp
- Apply blue clamp to the inflow line
- Remove the blue clamp from the drain line
- Open the twist clamp
- Allow to drain
- Repeat for number of flushes as ordered

31. When the final drain is complete, close the twist clamp on the transfer set and apply blue clamp to the drain line

32. Check expiration date of the Minicap, open package and leave the Minicap in the package

33.

A. <u>If the Nephrologist has ordered Heparin instillation (lock) into the catheter:</u>

- Draw up 7ml Heparin (1000 unit/ml) by using a 10 ml syringe
- Disconnect the Twin Bag tubing from the transfer set (remember to twist the twin bag tubing and not the transfer set tubing). Keep transfer set in non- dominant hand and drop the Twin Bag tubing onto the clean towel
- Keeping the transfer set in your non-dominant hand (do not set it down), pick up the heparin syringe and remove the blunt fill needle. Twist the Heparin syringe on to the transfer set
- Open the twist clamp on the transfer set and instils the heparin
- Close the twist clamp on the transfer set

- Disconnect the heparin syringe from the transfer set (do not set the transfer set down), pick up the new Minicap, verify that iodine soaked sponge is intact, and apply Minicap to the end of transfer set

B. If Heparin instillation is **NOT** ordered:

- Disconnect the Twin Bag tubing from the transfer set (remember to twist the twin bag tubing and not the transfer set tubing). Keep transfer set in non- dominant hand and drop the Twin Bag tubing onto the clean towel.
- Keeping the transfer set in your non-dominant hand (do not set it down), pick up the new Minicap, verify that iodine soaked sponge is intact and apply Minicap to the end of transfer set

34. Ensure that the transfer set is well stabilized on the patient's abdomen using an immobilizer, a PD 'belt' or Burnet. Do NOT apply tape directly on the transfer set

35. Observe the volume drained and weigh the effluent bag if indicated/ordered

36. Empty the drainage bag and discard the bag and tubing. (Face protection and non-sterile gloves to be worn for emptying of effluent bags). Follow specific PPE protocol if patient is on cytotoxic medications

37. Send the blue clamps for reprocessing when no longer needed

Section C: Heparinization of PD catheter without flush

Equipment:

Quantity	PRODUCT	Order #
1	Procedure mask	
1	Sterile gloves	
1	Non-sterile towel (plastic disposable)	220525
1	18 g blunt fill needle	
2	Minicaps	320810
1	10 ml syringe	
1	Heparin 1000 units per ml	

PROCEDURE:

1. Draw up 7 ml Heparin (1,000 unit/mL) using a 10 mL syringe.

- Apply medication label to the syringe
- Take syringe to bedside

2. Gather supplies, explain procedure to patient

3. Position the patient and expose the transfer set. Place a clean towel under the transfer set

4. Check expiration date of the Minicap, open package and leave the Minicap in the package. Don non sterile gloves. If patient or nurse has cold, or cough, mask is required

5. Check that the twist clamp on the transfer set is closed

6. Hold the transfer set in your non dominant hand, and remove the Minicap and drop on clean towel
7. While continuing to hold the transfer set (do not set it down) pick up heparin syringe and remove the blunt fill needle. Attach the syringe to the transfer set
8. Open twist clamp on the transfer set
9. Instill the Heparin
10. Close the twist clamp on the transfer set
11. Remove the syringe and drop syringe on clean towel. Pick up the new Minicap, verify that iodine soaked sponge is intact and apply to the end of transfer set
12. Ensure that the transfer set is well stabilized on the patient's abdomen using an immobilizer, PD 'belt' or Burnet. Do NOT apply tape directly on the transfer set

Section D: Drainage of the abdomen

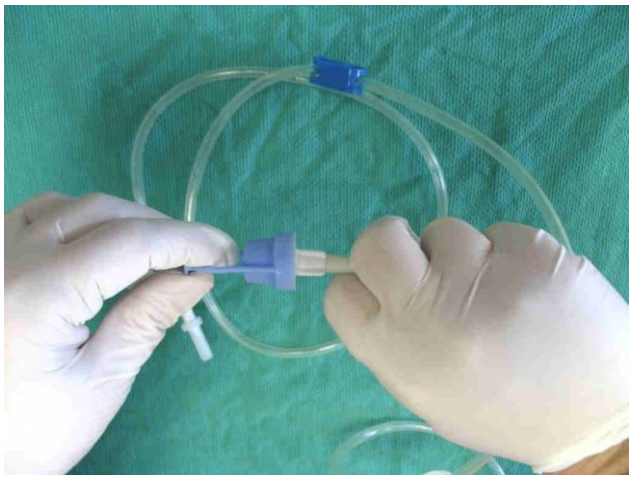
Equipment:

Quantity	PRODUCT	Order #
1	Procedure mask	
1	Non-sterile gloves	
1	Sterile gloves	
2	Minicaps	320810
1	Ultraset tubing (if unavailable, use a twin bag set)	321525
1	Non-sterile towel (plastic disposable)	220525

PROCEDURE:

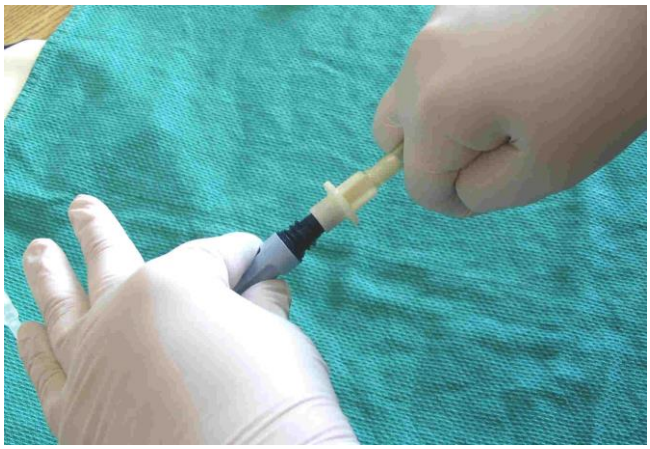
1. Gather supplies, explain procedure to patient
2. Perform hand hygiene.
3. Don mask (if you have a cough or cold).
4. Remove the Ultraset tubing from package. Close all clamps.
5. Position the patient and expose the transfer set. Place a clean towel under the transfer set.
6. Verify that the twist clamp on the transfer set is closed.
7. Loosen the Minicap on the transfer set ¼ turn but do not remove cap, place transfer set on towel.
8. Pick up the Ultraset tubing in your dominant hand, holding the tubing between your knuckles with the end facing out, leaves your fingers free to manipulate the mini-cap.
9. Remove the protective pull ring (see figure 6) and drop onto towel Ensure no contamination of the exposed end of the Ultraset), do NOT set it down once uncapped.

Figure 6



10. While holding the Ultraset tubing in your dominant hand, remove the Minicap from the transfer set and drop it on clean towel, connect the Ultraset tubing to the transfer set (see figure 7). Twist the tubing of the Ultraset; not the transfer set

Figure 7



11. Place the drainage bag on a clean surface that is lower than the patient's abdomen
12. Open the twist clamp on the transfer set and opens the clamp on the drain line. Start the drain, ensuring that the fluid is draining well
13. Remove gloves and perform hand hygiene
14. When the drain is complete, inspect the effluent for volume, clarity and presence of fibrin or blood. If cloudy, notify the Nephrologist
    - NOTE: if draining the abdomen for samples related to suspected peritonitis use a Twin Bag or an Ultraset to drain the abdomen and save this bag for obtaining samples, see HDU Medical Directive 1-03 (dwell time must be greater than 2 hours)

15. Put on non-sterile gloves. If patient or nurse has cold or cough, mask is required
16. Close the twist clamp on the transfer set and closes the clamp on the drain line
17. Follow steps 32-37 of section B

DOCUMENTATION:

1. For outpatients:
   - Document in NephroCare (medications in the medication screen and procedure in the progress note)
2. For inpatients:
   - Document medications on the Medication Administration Record and the procedure in the integrated progress notes

PATIENT TEACHING:

1. Review with patients:
   - Signs and symptoms of peritonitis, exit site infection
   - The need to keep the dressing clean and dry
   - Reason for drainage
   - The need to have regular bowel movements and to avoid constipation
   - The need for patient to follow protocol as taught when doing their independent dialysis
2. For Patients with new PD catheters provide the booklet: "Bowel routine for peritoneal dialysis" # P800 (06/2009)

RELATED POLICIES / LEGISLATION:

1. Corporate Policies and Procedures - #00014 Hand Hygiene
2. Corporate Policies and Procedures - #00233 Hand Hygiene Products and Materials
3. Infection Prevention and Control Policies and Procedures - #00023 Routine Practices
4. Nephrology Policies and Procedures - Home Dialysis - Section 01 - Medical Directives - HDU 1-02 Peritoneal Dialysis (PD) - Draining PD Fluid in Advance
5. Nephrology Policies and Procedures - Home Dialysis - Section 01 - Medical Directives - HDU 1-03 Peritoneal Dialysis - Management of Suspected Peritonitis
6. Nephrology Policies and Procedures - Home Dialysis - Section 01 - Medical Directives - HDU 1-08 Peritoneal Dialysis (PD) - Management when Peritonea
7. Nephrology Policies and Procedures - Home Dialysis - Section 01 - Medical Directives - HDU 1-09 Management of PD Catheter Post Insertion and Manipulation

REFERENCES:

1. Baxter Renal Division, Twin Bag Exchange Procedure poster, PD-S-12
2. City Wide CQI Manual Section 3: Peritoneal Dialysis Procedures- C.A.P.D., June 2006
3. Counts, C.S (2008) Core Curriculum for Nephrology Nursing 5th Edition pg 772-773, 781-786, 805-806, 810-811
4. Daugirdas, J.T., Blake, P.G., & Ing, T.S. (2007) Handbook of Dialysis 4th Edition pg 344, 377
5. Info to go- Caring for the PD patient (Instructor Manual) Baxter PD-T-06 pg 24

COMMENTS / SIGNIFICANT REVISIONS: N/A