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## PURPOSE

Peritoneal Dialysis is performed to remove fluids and toxins, regulate electrolyte levels and manage azotemia via diffusion and osmosis. Indications for peritoneal dialysis include:

- hyperkalemia
- oliguria or anuria
- metabolic acidosis
- fluid overload unresponsive to diuretics
- combination of the above
- renal failure

Expected outcomes of peritoneal dialysis include:

- therapeutic goals of Peritoneal Dialysis are achieved
- catheter and access site is maintained without complications
- peritoneal dialysis access site functions properly
- respiratory status is adequate throughout treatment
- patient has acceptable levels of comfort

## SITE APPLICABILITY

Peritoneal Dialysis is predominately done on the inpatient unit 3F.

## PRACTICE LEVEL/COMPETENCIES

Peritoneal Dialysis is an advanced skill and is practiced after the practitioner has obtained the required education and has had his/her learning validated at the bedside with the appropriate Dialysis Training Nurse.

## DEFINITIONS

**Azotemia** - is a medical condition characterized by abnormally high levels of nitrogen-containing compounds, such as urea, creatinine, various body waste compounds, and other nitrogen-rich compounds in the blood. It is largely related to insufficient filtering of blood by the kidneys. It is characterized by a decrease in the glomerular filtration rate (GFR) and increases in blood urea nitrogen (BUN) and serum creatinine concentrations.

**Dialysis fluid/dialysate**- prescribed sterile solution of specific concentrations to facilitate diffusion and osmosis across the peritoneal membranes.

**Fill volume** — the amount of dialysate prescribed to fill the peritoneal cavity per each cycle or run. The prescribed fill volume is based on weight or BSA of the child and is adjusted for numerous factors (e.g. patient's tolerance, more solute or fluid removal) in conjunction with the input of the nephrologist. Too small fill volumes may lead to rapid solute equilibration and inadequate ultrafiltration, too large fill volumes can lead to excessive increases in intra-peritoneal pressure that reduces dialysis efficiency due to enhanced lymphatic uptake. Excessive fill volumes may be associated with discomfort/pain, respiratory complications, hernia, gastroesophageal reflux, and hydrothorax.

**Effluent**- dialysis fluid (fill volume) plus ultrafiltrate and waste removal emptied from the peritoneal cavity.

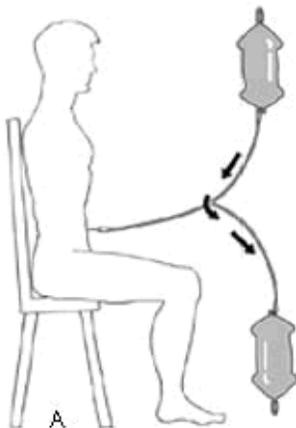
**Ultrafiltrate** – fluid and substances that have passed through the semipermeable membrane during dialysis. Calculated by subtracting dialysis fluid (fill volume) from the effluent volume.

**Hand Hygiene:** Refer to Infection Control Manual Policy and Procedure for Handwashing

**Peritoneal Dialysis (PD)** – A therapy where solutes and water are transported across the peritoneum (a semi-permeable membrane), utilizing a commercially prepared sterile solution which is introduced into and removed from the peritoneal cavity. The solution used is formulated to assist in the removal of toxins and regeneration of bicarbonate and removal of excess total body water and salt.

- **Intermittent PD (IPD):** Dialysis solution is present in the peritoneal cavity from time to time usually ranging from 15-20 exchanges per day, 3-4 days per week.
- **Continuous Ambulatory PD (CAPD):** Dialysis solution is always present in the peritoneal cavity. New solution is exchanged typically 3-5 times per day and performed manually by using gravity to move fluid into and out of the peritoneal cavity.
- **Continuous Cycling PD (CCPD):** Dialysis solution is always present in the peritoneal cavity where 6-12 night exchanges per day are performed by an automated machine (cycler) with a last fill dwelling throughout the day. This enables the patient to be disconnected from the machine and free to do normal daytime activities.

### Phases of an Exchange:



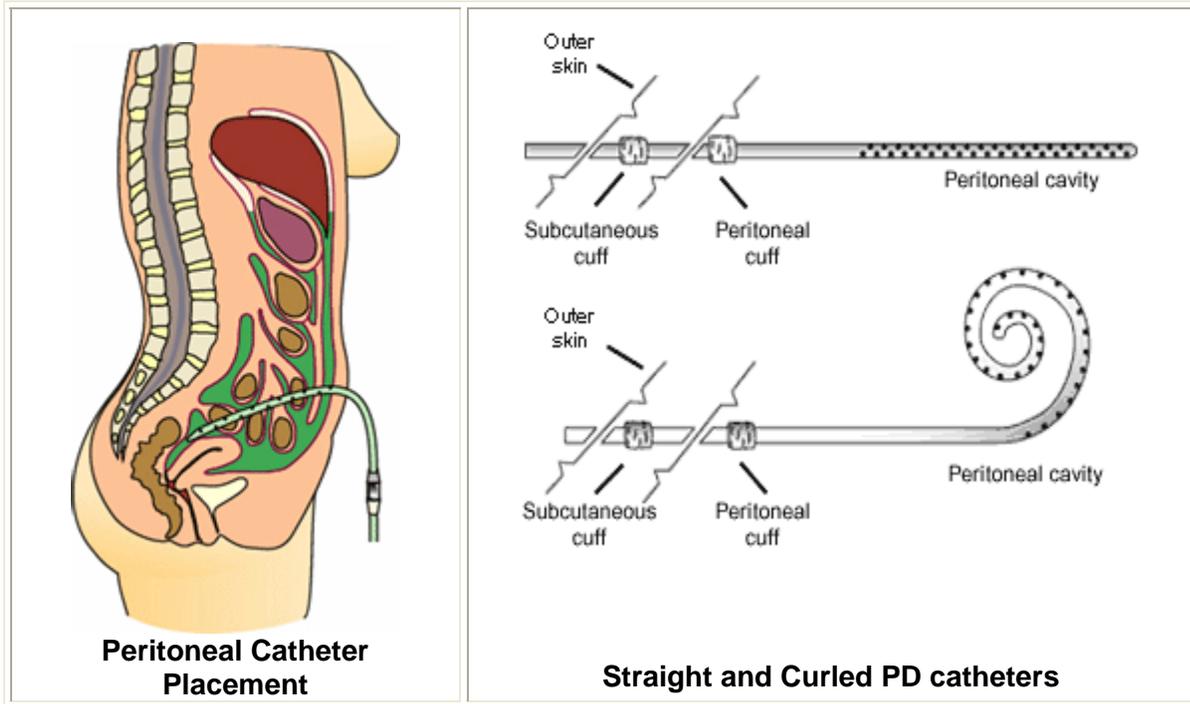
PD involves repeated fluid exchanges or cycles:

**Instillation or Fill Phase** – dialysis solution is infused into the peritoneal cavity through an abdominal catheter.

**Dwell Phase** – dialysate remains in the peritoneal cavity, which allows osmosis and diffusion to occur. Dwell time varies based on the child's clinical need and is prescribed by the responsible physician. Shorter dwell times increase ultrafiltration and urea clearance. Longer dwell times favour higher creatinine and phosphate clearance but may reduce ultrafiltration.

**Drain Phase** – the dialysate and the excess extracellular fluid, wastes, and electrolytes are drained from the peritoneal cavity via the peritoneal catheter.

**Peritoneal Catheter** – permits the infusion of dialysis fluid into the peritoneal space and the movement of water and associated solutes out of the peritoneal space.



**Titanium adapters** are adapters used to secure a Transfer Set or Dialysis Tubing to the PD catheter. They are lightweight and resistant to electrolyte-containing solutions and result in a tighter connection than plastic adapters. They do not chafe the catheter which can cause cracks or holes to develop.

**Transfer Set** – an extension tubing that attaches to the PD catheter at the skin level exit site. The transfer set remains in place between PD therapy and is replaced every 6 months or sooner if concerns regarding compromise of the transfer set integrity, post contamination episode or if recurrent/relapsing peritonitis.

Initiation of Peritoneal Dialysis requires a physician's written order. The order must be patient specific and include dialysis solution/concentration, fill volume, dwell time, frequency, last fill, number of cycles, and if heparin is to be added.

The addition of medications to dialysate solution requires a physician's written order. The order must be patient specific and include drug name, dosage, route, and frequency.

Strict aseptic technique is required during peritoneal dialysis catheter access to reduce the risk of peritoneal infection.

Peritoneal dialysis systems are changed every 96 hours or if system otherwise becomes contaminated.

An emergency clamping kit must always be prepared and available at the bedside.

### Peritoneal Dialysis Emergency Clamping Kit

- UltraClamp (Red) Clamp
- 2% Chlorhexidine/70% alcohol swabs
- Sterile towel
- Minicaps

**Setting Up and Initiating PD for Acute and Chronic Patients on Inpatient Unit 3F**  
**Policy Statements**

Both acute and chronic dialysis may be initiated utilizing either a Y-set System or the HomeChoice Pro Cycler. Differences in the prescription, dwell volumes used, cycle lengths and frequency are the main differences seen when comparing Acute to Chronic PD prescriptions and will be decided by the Nephrologist in consideration of the individual patient.

Initiation of Peritoneal Dialysis requires consent from the family or guardian and written orders by the Nephrologist. These orders must be patient specific and include the choice of dialysis solution and concentration, fill volume, inflow/dwell and drain times and cycle numbers if using a Y-set or total prescription time and cycle number if using Cycler. The choice of a last fill (if patient will be capped off) in terms of dialysis solution/ concentration and volume must also be specified.

The addition of ALL medications to any PD solution requires a Nephrologist's written order. The order must be patient specific and include drug name, dosage in both concentration and preferably also in total amount added per volume, route, and frequency and or orders for monitoring.

Aseptic technique is required during peritoneal dialysis catheter access to reduce the risk of peritonitis.

Peritoneal dialysis Y-set tubing is changed every 96 hours and cycler tubing every 24 hours or if the system otherwise becomes contaminated. Dialysis solutions are changed every 24 hours or as directed from the Stability Chart when medications are added. Please refer to the Stability Chart of Medications.

ALL infants and children receiving peritoneal dialysis MUST be weighed daily. This should occur on the same scale, same time (every 24 hours), same clothes, and following first morning void (if able). The child should be fully drained of their dwell, and weights must be recorded based on this "empty" weight.

Clinically unstable patients, or those with other concerns may require more frequent weights and this is at the discretion of the Nephrologist.

Dialysis fluid is heated between 36 to 37 degrees Celsius prior to instillation. At no time will this fluid be heated via microwave; rather the Home Choice may be used to warm and maintain appropriate temperature for both cycler fluid and even dialysate bags used for the Y-set.

<b>PROCEDURE</b>	<b>Rationale</b>				
1. <b>IDENTIFY</b> patient and <b>ENSURE</b> patient and family understand procedure and questions are answered (as appropriate)	<i>Evaluates and reinforces understanding of previously taught information.</i>				
2. <b>OBTAIN</b> and <b>VERIFY</b> Peritoneal Dialysis prescription from physician.					
3. <b>GATHER</b> needed equipment and supplies: <table border="1" data-bbox="134 1478 841 1917"> <thead> <tr> <th data-bbox="134 1478 509 1520"><b>Y-Set System:</b></th> <th data-bbox="509 1478 841 1520"><b>Cycler system:</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="134 1520 509 1917"> <ul style="list-style-type: none"> <li>▪ Dialysis fluid as per physician's orders</li> <li>▪ PD Administration Set (Y-Set)</li> <li>▪ PD Collection drainage bag</li> <li>▪ IV pole</li> <li>▪ Mask</li> <li>▪ Micropore (paper) tape</li> <li>▪ Sterile 4X4 gauze</li> <li>▪ Cycler (to use as a warmer)</li> </ul> </td> <td data-bbox="509 1520 841 1917"> <ul style="list-style-type: none"> <li>▪ Dialysis fluid concentration as per physician's orders</li> <li>▪ Cycler set with cassette (Standard or Low-recirculation)</li> <li>▪ 12 ft. Drain Line or Drain bag (15L x2)</li> <li>▪ Drain manifold (if using drain bag)</li> <li>▪ Mask</li> </ul> </td> </tr> </tbody> </table>	<b>Y-Set System:</b>	<b>Cycler system:</b>	<ul style="list-style-type: none"> <li>▪ Dialysis fluid as per physician's orders</li> <li>▪ PD Administration Set (Y-Set)</li> <li>▪ PD Collection drainage bag</li> <li>▪ IV pole</li> <li>▪ Mask</li> <li>▪ Micropore (paper) tape</li> <li>▪ Sterile 4X4 gauze</li> <li>▪ Cycler (to use as a warmer)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Dialysis fluid concentration as per physician's orders</li> <li>▪ Cycler set with cassette (Standard or Low-recirculation)</li> <li>▪ 12 ft. Drain Line or Drain bag (15L x2)</li> <li>▪ Drain manifold (if using drain bag)</li> <li>▪ Mask</li> </ul>	
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4. <b>MASK</b> and <b>PERFORM</b> hand hygiene.	<i>Standard/routine precautions.</i>
5. <b>PERFORM</b> the 7 checks of a dialysis bag: <ul style="list-style-type: none"> <li>• Right concentration</li> <li>• Right Volume</li> <li>• Expiration date</li> <li>• Clear Solution</li> <li>• No Leaks/Holes</li> <li>• Intact Frangible/Seal</li> <li>• Intact Port</li> </ul>	<i>Reduces errors and risk of contamination.</i>
<b>For Y-Set System:</b>	
6. <b>CLOSE</b> all clamps on tubing then <b>CONNECT</b> tubing to bags by luer lock.	
7. <b>ATTACH</b> drain bag to drain line.	
8. <b>SECURE</b> lines to pole using tape.	
9. <b>FILL</b> one buretrol with 70 millilitres (mL). <b>INVERT</b> the drip chamber filling it halfway. <b>CLOSE</b> clamp and return drip chamber to upright position.	
10. <b>OPEN</b> regulating clamp below chamber to prime tubing to end. <b>CLOSE</b> clamp.	
11. <b>FILL</b> second buretrol allowing solution to run through drip chamber and into drain bag. <b>Close</b> roller clamp.	
12. <b>OPEN</b> clamp on end of drainage bag to empty priming solution.	
13. <b>PLACE</b> clean towel underneath transfer set.	
14. <b>PERFORM</b> hand hygiene.	<i>Standard/routine precautions.</i>
15. <b>REMOVE</b> Minicap from patient's transfer set and <b>CONNECT</b> tubing to transfer set by luer lock.	
16. <b>OPEN</b> drain line allowing fluid to drain from the patient.	<i>Repositioning patient may assist with drainage.</i>
17. <b>CLOSE</b> drain line when drainage ceases.	
18. <b>MEASURE</b> amount of drainage/effluent and observe the appearance.	
19. <b>FILL</b> buretrol with prescribed volume + 10 mL	<i>Ensure 10 mL remains in bottom of buretrols to avoid trapping air in the line</i>
20. <b>FILL</b> patient with prescribed amount. <b>NOTE:</b> For an acute patient needing PD immediately, patient should be supine during the dwell time and started with small volume exchanges to prevent abdominal leak and risk of peritonitis.	
21. <b>DWELL</b> patient for amount of time ordered.	<i>During the dwell time, the dialysis solution bags are put on the cyclor for warming.</i>
22. <b>REPEAT</b> steps (drain, fill, dwell) for a complete exchange/cycle as ordered. <b>NOTE:</b> Patient may need 3 quick flushes (no dwell time) for: <ul style="list-style-type: none"> <li>• clearing blood in the peritoneal cavity (post catheter insertion)</li> </ul>	<i>Drain, fill, dwell is considered 1 complete exchange/cycle.</i>

<ul style="list-style-type: none"> <li>• ensuring the patency of the PD catheter</li> <li>• severe abdominal pain for suspected peritonitis (this is done prior to antibiotic administration)</li> <li>• contamination</li> </ul>	
<b>For Cyclor:</b>	
6. <b>TURN</b> on the cyclor machine.	
7. <b>SCROLL</b> down to “Change Program”	
8. <b>ENTER</b> dialysis prescription as per physician’s orders.	
9. <b>PRESS STOP</b> to complete entry.	
10. <b>PRESS GO</b> to set up the cyclor. Refer to “Home Choice PRO Automated PD Systems: Patient At-Home Guide”	
11. <b>CHECK</b> patient line for air.	
12. <b>PLACE</b> clean towel underneath transfer set.	
13. <b>MASK</b> and <b>PERFORM</b> hand hygiene.	<i>Standard/routine precautions; Reduces transmission of microorganisms and contamination.</i>
14. <b>REMOVE</b> Minicap from patient’s transfer set and <b>CONNECT</b> tubing to transfer set by luer lock.	
15. <b>OPEN</b> transfer set and <b>PRESS GO</b> to commence treatment. <b>NOTE:</b> Patient may need 3 quick flushes (bypassing the dwell phase) for: <ul style="list-style-type: none"> <li>○ severe abdominal pain for suspected peritonitis (this is done prior to antibiotic administration)</li> <li>○ contamination</li> </ul>	<i>Initiates dialysis.</i>

### Discontinuing Peritoneal Dialysis/Capping off the PD Catheter

PROCEDURE	<i>Rationale</i>
1. <b>DRAIN</b> dialysate from peritoneal cavity and <b>CLAMP</b> the catheter and the PD tubing once the effluent is completely drained.	
2. <b>PERFORM</b> hand hygiene and <b>GATHER</b> needed equipment and supplies: <ul style="list-style-type: none"> <li>• Mask</li> <li>• Securing device or tape</li> <li>• Povidone-iodine impregnated sterile cap (e.g. Baxter Opticap or Minicap)</li> <li>• Clean field</li> </ul>	<i>Facilitates completion of task in a timely manner.</i> <i>Standard/routine precautions.</i> <i>Reduces transmission of microorganisms and contamination from airborne pathogens.</i>
3. <b>MASK</b> and <b>PERFORM</b> hand hygiene.	
4. <b>PLACE</b> catheter on clean field. Aseptically, <b>OPEN</b> povidone-iodine impregnated cap from package.	
5. <b>DISCONNECT</b> the catheter from the PD tubing and <b>CONNECT</b> povidone-iodine impregnated cap to end of transfer set tubing.	
6. <b>SECURE</b> catheter to abdomen by using a securing device or tape.	<i>Avoids trauma to exit site or dislodgement of catheter; excessive movement interferes with epithelialization and healing of the exit site.</i>

**Monitoring and Care of Child Receiving Peritoneal Dialysis**

Monitor for complications and adverse outcomes in patients receiving peritoneal dialysis such as:

- Electrolyte imbalances
- Excessive fluid gains or losses
- Drainage or leakage from the exit site
- Infection
- Bowel perforation
- Dislodgement or disconnection of the PD catheter or tubings
- Respiratory complications

<b>GUIDELINES</b>	<b>Rationale</b>
1. <b>PERFORM</b> and <b>RECORD</b> pre-dialysis daily weights.	<i>Patient weights are important in guiding ongoing treatment.</i>
2. <b>PERFORM</b> baseline and ongoing assessments including: <ul style="list-style-type: none"> <li>• Vital signs</li> <li>• Presence of edema</li> <li>• Intake and output</li> <li>• Abdominal assessment</li> </ul>	<i>Establishes a baseline before therapy and monitoring through treatment for complications and unexpected outcomes.</i>
3. <b>MONITOR</b> laboratory results throughout treatment.	<i>Fluids and electrolytes shift during PD therapy.</i>
4. <b>MONITOR</b> the integrity of the PD setup.	<i>Disconnection in the setup provides a portal of entry for pathogens, which can lead to peritonitis.</i>
5. <b>MONITOR</b> for any difficulty filling or draining.	<p><i>Children may need repositioning to facilitate flow through the PD catheter.</i></p> <p><i>Catheters may become kinked or obstructed.</i></p> <p><i>Fibrin clots can obstruct drainage – heparin may be added to the dialysate to prevent this.</i></p> <p><i>If clotting is suspected, antithrombotic agents may be required.</i></p>

**Changing the Transfer Set Policy Statements**

A transfer set attachment to the PD catheter is required to enable a closed system upon discontinuation/disconnection from PD system. The transfer set is usually attached to the PD catheter at time of insertion in the operating room. Thereafter, the transfer set is changed every 6 months to reduce infection rate or sooner if concerns regarding compromise of the transfer set integrity, post contamination episode or in recurrent/relapsing peritonitis. The Transfer Set must also be changed if the Titanium Adaptor is changed.

<b>PROCEDURE</b>	<b>Rationale</b>
<p>1. <b>PERFORM</b> hand hygiene and <b>GATHER</b> needed equipment and supplies:</p> <ul style="list-style-type: none"> <li>• 70% alcohol and paper towel or disinfectant wipe</li> <li>• Chlorhexidine (CHG) 2% solution with 70% alcohol and Gauze 4x4 (3) or 3 large CHG/alcohol swabs</li> <li>• Transfer Set (appropriate size – see rationale for selection criteria)</li> <li>• Minicap (povidone-iodine impregnated cap)</li> <li>• Clean towel or blue pad</li> <li>• Red UltraClamp Tubing Clamp</li> <li>• Mask</li> <li>• Sterile gloves</li> <li>• Sterile dressing tray</li> </ul>	<p><i>Facilitates completion of task in a timely manner.</i></p> <p><i>Standard/routine precautions.</i></p> <p><i>There are 2 sizes of Transfer Sets – “Short” and “Extra Short.”</i></p> <p><i>The “Short” set is generally used unless a patient is an infant or requests the “Extra Short”.</i></p> <p><i>When replacing a Transfer Set, the same length set is used unless the nurse determines that the other length would be more appropriate or the patient requests it.</i></p>
<p>2. <b>IDENTIFY</b> patient and <b>ENSURE</b> patient and family understand procedure and questions are answered. <b>PLACE</b> towel or blue pad under patient.</p>	<p><i>Evaluates and reinforces understanding of previously taught information.</i></p>
<p>3. <b>CLAMP</b> the catheter close to the patient using the red UltraClamp tubing clamp.</p>	<p><i>Prevents leaking of fluid when transfer set removed.</i></p>
<p>4. <b>CLEAN</b> the working surface using 70% alcohol and a paper towel or disinfectant wipe.</p>	<p><i>Standard/routine precautions; Reduces transmission of microorganisms and contamination from airborne pathogens.</i></p>
<p>5. <b>PREPARE</b> supplies using aseptic technique.</p>	
<p>6. <b>MASK</b> and <b>PERFORM</b> hand hygiene. <b>DON</b> sterile gloves.</p>	
<p>7. <b>CLOSE</b> twist clamp on new transfer set.</p>	
<p>8. <b>PLACE</b> sterile drape over patient and <b>EXPOSE</b> the catheter.</p>	
<p>9. <b>CLEANSE</b> the connection site between the catheter and transfer set with CHG soaked gauze/swab as follows:</p> <ol style="list-style-type: none"> <li>a. <b>WRAP</b> first gauze/swab around the connection site, <b>SCRUB</b> for 1 minute, and <b>HOLD</b>.</li> <li>b. While holding the first gauze/swab around the connection, <b>CLEAN</b> with the second gauze from the connection site toward the patient up to the red clamp, and <b>DISCARD</b>.</li> <li>c. <b>CLEAN</b> with the third gauze/swab from the</li> </ol>	<p><i>Aseptic technique.</i></p>

<p>connection site away from the patient up to the twist clamp of the Transfer Set and <b>DISCARD</b>.</p> <p>d. <b>DISCARD</b> first gauze/swab and allow connection to dry for 1 minute.</p>	
10. <b>DISCONNECT</b> the old Transfer Set and <b>DISCARD</b> .	
11. <b>REMOVE</b> the blue protective cap from the new Transfer Set.	
12. Tightly <b>CONNECT</b> the new Transfer Set to the catheter via the adapter.	
13. <b>REMOVE</b> the red UltraClamp from the catheter. <b>OPEN</b> the twist clamp of the Transfer Set and, <i>if possible</i> , allow fluid to drain into the Transfer Set.	<i>Displaces air in the Transfer Set.</i>
14. <b>CLOSE</b> the twist clamp on the Transfer Set.	<i>Stops flow of fluid.</i>
15. <b>OPEN</b> Minicap package, <b>REMOVE</b> the clear protective end of the Transfer Set and <b>ATTACH</b> the Minicap to the Transfer Set.	
16. <b>SECURE</b> catheter and Transfer Set to patient using immobilising device. <b>ENSURE</b> no kinks or tension on the catheter when in the immobiliser.	<i>Trauma to exit site can increase the risk of bacterial growth followed by infections. It is important to minimize catheter movement to prevent fluid leaks from the exit site when performing peritoneal dialysis.</i>
17. <b>DISCARD</b> used supplies and equipment in appropriate receptacle and <b>PERFORM</b> hand hygiene.	<i>Standard/routine precautions; reduces transmission of microorganisms.</i>

**Applying a Titanium Adapter (for Transfer Set Connection)  
Policy Statements**

A Titanium Adaptor is used with most catheters to connect the catheter to the Transfer Set or directly to the dialysis tubing. It is added in the OR on all peritoneal dialysis catheters. The adapter will need to be changed in the following circumstances:

- a) Plastic adapter is in situ
- b) Adapter is faulty
- c) The distal catheter (adjacent to the titanium connection) is cracked or damaged (note if the proximal catheter is cracked or damaged within 5 cm from exit site, insertion of a new PD catheter is required).

<b>PROCEDURE</b>	<b>Rationale</b>
<p>1. <b>PERFORM</b> hand hygiene and <b>GATHER</b> needed equipment and supplies:</p> <ul style="list-style-type: none"> <li>• 70% alcohol and paper towel or disinfectant wipe</li> <li>• Chlorhexidine (CHG) 2% solution with 70% alcohol and Gauze 4x4 (3) or 3 large CHG/alcohol swabs</li> <li>• Transfer Set</li> <li>• Titanium Adapter (2 piece female luer lock)</li> <li>• Minicap (povidone-iodine impregnated cap)</li> <li>• Clean towel or blue pad</li> <li>• Red UltraClamp Tubing Clamp</li> <li>• Mask</li> <li>• Sterile gloves</li> <li>• Sterile scissors</li> <li>• Sterile dressing tray</li> </ul>	<p><i>Facilitates completion of task in a timely manner.</i></p> <p><i>Standard/routine precautions.</i></p>
<p>2. <b>IDENTIFY</b> patient and <b>ENSURE</b> patient and family understand procedure and questions are answered. <b>PLACE</b> towel or blue pad under patient.</p>	<p><i>Evaluates and reinforces understanding of previously taught information.</i></p>
<p>3. <b>CLAMP</b> the catheter close to the patient using the red UltraClamp tubing clamp.</p>	<p><i>Prevents leaking of fluid when transfer set and adapter are removed.</i></p>
<p>4. <b>CLEAN</b> the working surface using 70% alcohol and a paper towel or disinfectant wipe.</p>	<p><i>Standard/routine precautions; Reduces transmission of microorganisms and contamination from airborne pathogens.</i></p>
<p>5. <b>PREPARE</b> supplies using aseptic technique.</p>	
<p>6. <b>MASK</b> and <b>PERFORM</b> hand hygiene. <b>DON</b> sterile gloves.</p>	
<p>7. <b>CLOSE</b> twist clamp on new transfer set.</p>	
<p>8. <b>PLACE</b> sterile drape over patient and <b>EXPOSE</b> the catheter.</p>	<p><i>Aseptic technique.</i></p>
<p>9. If distal end of the catheter is cracked or damaged and the adaptor is still in situ:</p> <ul style="list-style-type: none"> <li>• <b>WRAP</b> first chlorhexidine soaked gauze/swab around the damaged area of the catheter, <b>SCRUB</b> for 1 minute, and <b>HOLD</b> in place.</li> <li>• <b>CLEAN</b> with second chlorhexidine soaked gauze/swab from the damaged area of the catheter towards the patient up to the red</li> </ul>	<p><i>Prepares catheter for insertion of titanium adapter.</i></p>

<p>clamp, and DISCARD.</p> <ul style="list-style-type: none"> <li>• With the third chlorhexidine soaked gauze/swab, <b>CLEAN</b> from the damaged area of the catheter away from the patient along the Transfer Set up to the twist clamp. Allow CHG to dry.</li> <li>• <b>INSPECT</b> and <b>CUT</b> below the damaged piece (straight across, no angulation) using sterile scissors.</li> </ul> <p>If changing a Plastic Adaptor to a Titanium Adaptor:</p> <ul style="list-style-type: none"> <li>• <b>WRAP</b> first CHG/alcohol soaked gauze at the connection site, <b>SCRUB</b> for 1 minute, and <b>HOLD</b> in place.</li> <li>• <b>CLEAN</b> with second CHG/alcohol soaked gauze from the connection site towards the patient up to the red clamp, and <b>DISCARD</b>.</li> <li>• With the third CHG/alcohol soaked gauze, <b>CLEAN</b> from connection site away from the patient along the Transfer Set up to the twist clamp.</li> <li>• <b>CUT</b> the catheter immediately proximal to the old Adapter (straight across, no angulation) using sterile scissors.</li> </ul>	
<p>10. <b>INSERT</b> the narrow end of the titanium sleeve (non-threaded end) onto the end of the exposed catheter, then insert the luer end of the adapter all the way into the catheter until fully advanced.</p>	<p><i>Secures Titanium Adapter to PD catheter.</i></p>
<p>11. <b>SLIDE</b> the titanium sleeve back down towards the adaptor and <b>SCREW</b> into the adaptor firmly.</p>	
<p>12. <b>CONNECT</b> the new Transfer Set to the patient's catheter via the adapter as per steps 11-17 of procedure for <a href="#">changing Transfer Set</a>.</p>	
<p>13. <b>SEND</b> the used Titanium Adaptor to Sterile Processing Department labelled "Return to Renal Dialysis Unit".</p>	<p><i>The titanium adapter is <b>not disposable</b> and must be appropriately sterilized between uses.</i></p>

**Adding Medications to the PD Solution  
Policy Statements**

The addition of medications to dialysate solution requires a physician's written order. The order must be patient specific and include drug name, dosage, route, and frequency.

<b>PROCEDURE</b>	<b>Rationale</b>
1. <b>PERFORM</b> hand hygiene and <b>GATHER</b> needed equipment and supplies: <ul style="list-style-type: none"> <li>• Chlorhexidine 2%/alcohol swabs 70%</li> <li>• Syringe</li> <li>• Needle</li> <li>• Medication/Diluent if necessary</li> <li>• Dialysis solution</li> </ul>	<i>Facilitates completion of task in a timely manner. Standard/routine precautions.</i>
2. <b>OPEN</b> and <b>REMOVE</b> the outer wrap from the dialysis solution bag onto a surface cleansed with alcohol.	
3. <b>PERFORM</b> the 7 checks of a dialysis bag: <ul style="list-style-type: none"> <li>• Right concentration</li> <li>• Right Volume</li> <li>• Expiration date</li> <li>• Clear Solution</li> <li>• No Leaks/Holes</li> <li>• Intact Frangible/Seal</li> <li>• Intact Port</li> </ul>	<i>Reduces error and risk of contamination.</i>
4. <b>PREPARE</b> medication aseptically as per Mixing Medications for Parenteral Administration procedure.	<i>Reduces transmission of microorganisms and contamination.</i>
5. <b>SCRUB</b> the peritoneal dialysis solution bag's medication port with a CHG/alcohol swab for 1 minute and allow to <b>DRY</b> .	<i>To reduce the risk of peritonitis</i>
6. <b>INJECT</b> prepared medication into the medication port and <b>WITHDRAW</b> the needle.	
7. <b>INVERT</b> the bag gently several times.	<i>Ensures the medication has mixed well.</i>
8. <b>DISCARD</b> used needle and syringe safely in a sharps container.	

**Heparin Flushing a PD Catheter Policy Statements**

A Peritoneal Dialysis Catheter is flushed weekly with heparin when catheter is not in use or more frequently if there is prominent bloody dialysate. A physician's order is required for flushing with heparin. The order may specify "heparin flush peritoneal catheter as per protocol."

The dose of heparin is 1 mL heparin (1000 units/mL) diluted with 7 mL NS to total volume 8 mL.

<b>PROCEDURE</b>	<b>Rationale</b>
1. <b>REVIEW</b> order for heparin flushing.	<i>There is no clear evidence supporting the various approaches to maintaining patency of a newly placed catheter that is not being utilised (or similarly an old PD catheter not being utilised such as early post renal transplantation). In these settings weekly flushing with heparin can be employed. If there has been prominent bloody dialysate during the post catheter insertion dialysis exchanges, it is recommended (opinion). Alternative strategies for PD catheter 'break-in' followed by other units include 1-3 times weekly quick in/out exchange of □eparinised (500u/L) saline/ dianeal.</i>
2. <b>GATHER</b> needed equipment and supplies: <ul style="list-style-type: none"> <li>• Mask</li> <li>• Vial normal saline</li> <li>• Heparin 1000 units/mL vial</li> <li>• 10 mL syringe/needle</li> <li>• Chlorhexidine 2%(CHG)/alcohol swab 70%</li> <li>• Minicap (povidone-iodine impregnated cap)</li> </ul>	<i>Facilitates completion of task in a timely manner.</i>
3. <b>MASK</b> and <b>PERFORM</b> hand hygiene.	<i>Standard/routine precautions.</i>
4. <b>SCRUB</b> rubber top of heparin vial and saline vial with CHG/alcohol swab and allow to dry.	
5. <b>DRAW</b> 1 mL heparin (1000 units) and 7 mL saline into syringe to a total of 8 mL.	
6. <b>CLOSE</b> clamp on Transfer Set if not already closed	<i>Occludes catheter.</i>
7. <b>REMOVE</b> Minicap.	
8. <b>ATTACH</b> heparin syringe to Transfer Set, <b>OPEN</b> Transfer Set clamp, and <b>INJECT</b> heparin/saline solution.	
9. <b>CLOSE</b> Transfer Set clamp and <b>REMOVE</b> syringe.	
10. <b>APPLY</b> new Minicap to Transfer Set.	
11. <b>SECURE</b> catheter and Transfer Set to patient using immobilising device. <b>ENSURE</b> no kinks or tension on the catheter when in the immobiliser.	<i>Trauma to exit site can increase the risk of bacterial growth followed by infections. It is important to minimize catheter movement to prevent fluid leaks from the exit site when performing peritoneal dialysis.</i>

**Specimen Collection: Peritoneal Dialysis Effluent  
Policy Statements**

A cell count, gram stain and culture of effluent is obtained if peritonitis is suspected (e.g. cloudy dialysate return, fever), or patient appears clinically septic.

<b>PROCEDURE</b>		<b>Rationale</b>	
<p>1. <b>GATHER</b> needed equipment and supplies:</p> <ul style="list-style-type: none"> <li>• Mask</li> <li>• Gloves</li> <li>• 2 C&amp;S containers</li> <li>• Minicap (povidone-iodine impregnated cap) (not on treatment)</li> <li>• 50 mL syringe/#20 gauge needle (CAPD)</li> <li>• Chlorhexidine 2%(CHG)/alcohol 70% swab (IPD, CAPD)</li> <li>• Effluent Sample Bag (CCPD)</li> </ul>		<p><i>Facilitates completion of task in a timely manner.</i></p> <p><i>Standard/routine precautions.</i></p>	
<p>2. <b>MASK</b> and <b>PERFORM</b> hand. <b>DON</b> clean gloves.</p>			
<p>3. <b>COLLECT</b> specimens by one of the following methods depending on dialysis treatment used:</p>			
<b>IPD</b>	<b>CCPD</b>	<b>CAPD</b>	<b>Not on Treatment (during the day)</b>
<ul style="list-style-type: none"> <li>• Obtain specimens during a <b>drain cycle</b></li> <li>• Carefully remove spike from drainage bag</li> <li>• Clean spike with CHG/alcohol swab for 1 minute and let dry</li> <li>• Open drainage roller clamp and collect 60 mL effluent directly into the C&amp;S container</li> <li>• Aseptically re-insert drainage spike into drainage bag</li> <li>• Open roller clamp and continue with drain cycle.</li> <li>• Pour 10 mL of specimen collected into 2<sup>nd</sup> C&amp;S container for cell count.</li> </ul>	<ul style="list-style-type: none"> <li>• Obtain specimens during <b>Initial Drain</b> or <b>Drain 1</b></li> <li>• Close clamp on sample bag</li> <li>• Connect bag to the short line that forms a "Y" on the drain line (sample line). Save caps in empty sterile sample bag package</li> <li>• Position bag below the level of the drain line</li> <li>• After draining for 2 minutes, open clamps</li> <li>• When the sample bag is full, close both clamps</li> <li>• Disconnect sample bag and recap sample line (or cover with sterile gauze)</li> <li>• Transfer 50 mL sample into one C&amp;S container and 10 mL in the other.</li> </ul>	<ul style="list-style-type: none"> <li>• Perform CAPD (twin bag) according to protocol</li> <li>• Clean injection port of drain bag with CHG/alcohol swab for 1 minute and let dry</li> <li>• Withdraw 60 ml effluent from drain bag using needle and syringe</li> <li>• Transfer 50 mL sample into one C&amp;S container and 10 mL in the other.</li> </ul>	<ul style="list-style-type: none"> <li>• Connect sample bag to transfer set</li> <li>• Open the twist clamp on the Transfer Set and fill sample bag with 60 mL effluent (If patient has no fluid to drain, fill patient with their regular fill volume preferably using CAPD and dwell for 2 hours and then obtain sample accordingly)</li> <li>• Close the twist clamp and clamp the sample bag</li> <li>• Open Minicap package</li> <li>• Disconnect sample bag from Transfer Set</li> <li>• Attach Minicap to Transfer Set</li> <li>• Transfer 50 mL sample into one C&amp;S container and 10 mL in the other.</li> </ul>

4. **LABEL** containers with patient identification and **COMPLETE** requisitions.

*50 mL specimen for Culture and Sensitivity (C&S) and gram stain, specifically request to “Please report sensitivity to Vancomycin, cefazolin, ceftazidne and tobramycin”.*

*10 mL specimen for cell count.*

5. **SEND** specimens to laboratory. If peritonitis is suspected, send to lab STAT.

*Ensures prompt identification and reporting of infectious organisms to prompt initiation of appropriate treatment.*

**Disconnecting and Capping Off the Peritoneal Dialysis Catheter**

Procedure	Rationale
1. <b>IDENTIFY</b> patient and <b>ENSURE</b> patient and family understand procedure and questions are answered (as appropriate)	<i>Evaluates and reinforces understanding of previously taught information.</i>
2. <b>CLOSE</b> curtains around bed or door to room.	<i>Standard/routine precautions; Ensures privacy.</i>
3. <b>GATHER</b> the supplies: <ul style="list-style-type: none"> <li>o Clean towel</li> <li>o Minicap ® or Opticap ® (check expiration date on package.)</li> <li>o Mask</li> </ul>	<i>Facilitates completion of task in a timely manner.</i>
4. <b>PLACE</b> a clean towel under catheter.	
5. <b>CLOSE</b> the transfer set.	
6. <b>MASK</b> and <b>PERFORM</b> hand hygiene.	<i>Standard/routine precautions.</i>
7. <b>OPEN</b> the Minicap or Opticap package.	
8. <b>DISCONNECT</b> tubing from the transfer set.	
9. <b>PLACE</b> Minicap on transfer set and luer lock tightly. If using Opticap, <b>PLACE</b> the Minicap on transfer set and screw on tightly and <b>PLACE</b> second cap on patient-line tubing and luer lock tightly.	<i>Maintains asepsis.</i>

**Exit Site Care – Post Peritoneal Dialysis Catheter Insertion  
Policy Statements**

In the immediate post-operative period, a peritoneal dialysis catheter exit site dressing is changed every 7 days for 2-3 weeks until healed and/or if a large amount of drainage is present. To minimize trauma and promote adherence to the cuff and healing of the site, the catheter is to remain undisturbed as much as possible.

PROCEDURE	Rationale
<p>1. <b>GATHER</b> needed equipment and supplies:</p> <ul style="list-style-type: none"> <li>• 70% alcohol and paper towel or disinfectant wipe</li> <li>• Sterile Normal Saline</li> <li>• 3-6 packages of 2x2 gauze</li> <li>• Sterile Q-tips</li> <li>• Sterile gauze dressing (e.g. Mepore®)</li> <li>• Sterile dressing tray</li> <li>• Antibiotic ointment ordered</li> <li>• Immobilizing device</li> <li>• Clean gloves</li> <li>• Sterile gloves</li> </ul>	<p><i>Facilitates completion of task in a timely manner.</i></p>
<p>2. <b>CLEAN</b> the work surface area with 70% alcohol and paper towel or disinfectant wipe.</p>	<p><i>Standard/routine precautions; reduces transmission of microorganisms.</i></p>
<p>3. <b>MASK, PERFORM</b> hand hygiene.</p>	
<p>4. <b>PREPARE</b> equipment using aseptic technique.</p>	
<p>5. <b>DON</b> clean gloves. <b>REMOVE</b> old dressing and <b>DISCARD</b>.</p>	
<p>6. <b>REMOVE</b> catheter from immobilizer.</p>	
<p>7. <b>ASSESS</b> exit site for redness, swelling, tenderness, or drainage. If infection is suspected, <b>NOTIFY</b> physician. <b>CULTURE</b> site after cleansing in step 8. <i>If clear drainage is suspected, dip a glucose strip in fluid to determine if potential leak</i></p>	<p><i>Culturing a site after cleansing is believed to be more reflective of tissue bioburden than swabs of exudate.</i></p>
<p>8. <b>DISCARD</b> gloves. <b>PERFORM</b> hand hygiene and <b>DON</b> sterile gloves.</p>	<p><i>Standard/routine precautions; reduces transmission of microorganisms.</i></p>
<p>9. <b>LIFT</b> catheter with sterile gauze and clean the area around the catheter with saline-soaked gauze moving outward in a circular motion covering a 5 cm radius around the exit site. Repeat as needed until clean. <b>CULTURE</b> site if needed</p>	<p><i>There is evidence in surgical literature that wound disinfectants, such as hydrogen peroxide and providone iodine, can cause tissue damage and delay wound healing.</i></p>
<p>10. <b>DRY</b> the area around the catheter with dry gauze.</p>	
<p>11. <b>APPLY</b> antibiotic ointment with sterile q-tips.</p>	<p><i>Antibiotic ointment is used as a preventative measure to fight against gram-positive organisms such as S. aureus and gram-negative such as pseudomonas.</i></p>
<p>12. <b>APPLY</b> 4 – 2x2 gauze and gauze dressing (e.g. Mepore®) over exit site. Reinforce with a second dressing if necessary.</p>	<p><i>Trauma to exit site can increase the risk of bacterial growth followed by infections. It is important to minimize catheter movement to</i></p>

<p>13. <b>PLACE</b> catheter in immobilizer device and secure well not allowing any tension or kink in the line once secured</p>	<p><i>prevent fluid leaks from the exit site when performing peritoneal dialysis (PD). It is preferred to initiate PD 2 weeks post catheter insertion. If PD is needed prior to 2 weeks, patient should be supine during the dwell time and started with small volume exchanges</i></p>
<p>14. <b>DISCARD</b> used supplies and equipment in appropriate receptacle.</p>	<p><i>Standard/routine precautions; reduces transmission of microorganisms.</i></p>

**Exit Site Care – Chronic (Healed)  
Policy Statements**

A well healed chronic exit site does not require a dressing but needs to be cleansed and dried daily. It is imperative that the peritoneal dialysis catheter be secured appropriately to prevent trauma to the exit site.

If a dressing is used on a healed site, it is changed daily and when it is grossly dirty or wet. Frequent cleansing is essential to reduce resident bacteria.

The preferred timing for cleansing the exit site is following daily showering. If patient is unable to shower, the site is cleansed daily using soap and water in the same manner.

Water submersion is contraindicated but infants and small children who do not shower may have tub baths if the water is below the waist line (below exit site).

PROCEDURE	Rationale
<p>1. <b>PERFORM</b> hand hygiene and <b>GATHER</b> needed equipment and supplies:</p> <ul style="list-style-type: none"> <li>• Clean wash cloth or gauze</li> <li>• Liquid soap</li> <li>• Q-Tips</li> <li>• Antibiotic ointment ordered</li> <li>• Sterile gauze dressing (e.g. Mepore®)</li> <li>• Immobilizing device</li> </ul>	<p><i>Standard/routine precautions; reduces transmission of microorganisms.</i></p>
<p>2. <b>REMOVE</b> catheter dressing.</p>	
<p>3. <b>ASSESS</b> exit site for redness, swelling, tenderness, or drainage. If infection is suspected, <b>NOTIFY</b> physician. <b>CULTURE</b> site after cleansing.</p> <ul style="list-style-type: none"> <li>• Refer to <a href="#">Exit Site Assessment Scoring System</a> to help determine if an infection is present.</li> <li>• If clear drainage is suspected, dip a glucose strip in fluid to determine if potential leak.</li> </ul>	<p><i>As the subjective judgment of an exit-site status may differ widely, it is imperative that objective criteria be used to diagnose an exit-site infection.</i></p> <p><i>Culturing a site after cleansing is believed to be more reflective of tissue bioburden than swabs of exudate.</i></p>
<p>4. <b>SHOWER</b> or <b>BATHE</b> as usual if showering or bathing.</p>	
<p>5. <b>REMOVE</b> catheter from immobilizer after shower.</p>	<p><i>Keeps catheter immobilized while showering.</i></p>
<p>6. <b>WASH</b> around the catheter exit site with soap and water using a clean wash cloth, moving outward in a circular motion covering a 5-cm radius around the exit site. Do not forcibly remove crusting or scabs during cleansing because this may traumatize the exit site, causing a break in the skin and increasing the risk of infection. <b>CULTURE</b> site if needed.</p>	
<p>7. <b>RINSE</b> area in same manner and <b>DRY</b> the skin around the catheter with a clean towel.</p>	
<p>8. <b>APPLY</b> antibiotic ointment with q-tips</p>	<p><i>Antibiotic ointment is used as a preventative measure to fight against gram-positive organisms such as S. aureus and gram-negative organisms such as pseudomonas.</i></p>

9. <b>APPLY</b> a gauze dressing over exit site if using.	<i>Trauma to exit site can increase the risk of bacterial growth followed by infections.</i>
10. <b>PLACE</b> catheter in immobilizer device and secure well not allowing any tension or kink in the line once secured.	<i>It is important to minimize catheter movement to prevent fluid leaks from the exit site when performing peritoneal dialysis (PD).</i>
11. <b>DISCARD</b> used supplies and equipment in appropriate receptacle.	<i>Standard/routine precautions; reduces transmission of microorganisms.</i>

### DOCUMENTATION

Document on appropriate records including Peritoneal Dialysis Flowsheet, Nurses' Notes, MAR, Patient Care Flowsheet:

- Date and time of treatment initiation/discontinuation, transfer set change, Titanium Adaptor application, specimens collected and reason
- Condition of peritoneal catheter and exit site assessment
- Exit site care
- Dressing changes
- Date and time of exchange
- Dialysis solution used (including additives), volume of dialysis fluid instilled, dwell time, amount and appearance of effluent
- Medications added to dialysate (date, time, drug name, dosage, route)
- Intakes and output and peritoneal dialysis fluid balance (hourly and cumulative output totals)
- Heparin flushes (date, time, dosage, route)
- Daily weights
- Vital signs
- Child's tolerance of procedure(s)
- Patient/Family Education
- Unexpected outcomes and complications
- any other pertinent actions or observations

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**APPENDIX A: HOW TO CULTURE AN INCISION OR WOUND**

1. **CLEAN** incision/wound of any debris or pus, bacterial buildup or necrotic tissue with normal saline. Irrigate the wound if needed.
2. **ALLOW** the incision/wound to air dry.
3. **SWAB** the incision/wound with a sterile culture swab. Gather fluid from inside the incision/wound and along the edges if applicable by **ROTATING** the tip of the swab over a 1 cm<sup>2</sup> area of the wound using sufficient pressure to express fluid from within the wound tissue.

*Rationale: This technique is believed to be more reflective of tissue bioburden than swabs of exudate or swabs taken with a broad Z-stroke. Theoretically, this technique, known as the Levine technique, is the best technique for wound swabbing, provided the wound is cleansed first and the area sampled is over viable tissue, not necrotic tissue or eschar.*

4. **PLACE** the culture swab into the tube with medium.
5. **LABEL** specimen and requisition with:
  - a. patient identification
  - b. location and type of wound (eg. post surgical incision, cellulitis, pressure ulcer)
  - c. antibiotics the patient is receiving
  - d. collection date and time
  - e. patient diagnosis
6. **PLACE** specimen in biohazard transport bag and transport to lab promptly.

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**APPENDIX B: PERITONEAL DIALYSIS EXIT SITE ASSESSMENT SCORING SYSTEM\***

	0 Points	1 Point	2 Points
<b>Swelling</b>	No	Exit only ( < 0.5 cm)	Including part of or entire tunnel
<b>Crust</b>	No	< 0.5 cm	> 0.5 cm
<b>Redness</b>	No	< 0.5 cm	> 0.5 cm
<b>Pain on Pressure</b>	No	Slight	Severe
<b>Secretion</b>	No	Serous	Purulent

\*Infection should be assumed with a cumulative exit-site score of 4 points or greater.

**Reference:**

Warady, B.A., Schaefer, F., Holloway, M., Alexander, S., Kandert, M., Piraino, B., Salusky, I., Tranaeus, A., Divino, J., Honda, M., Mujais, S. and Verrina, E. (2000). Consensus guidelines for the treatment of peritonitis in pediatric patients receiving peritoneal dialysis. *Peritoneal Dialysis International*. 20(6), 610-24.