

# PD Procedures

## Inflow and Outflow Complications

### 1.0 Practice Standard

The Registered Nurse and the Licensed Practical Nurse who is trained and has demonstrated competency in Peritoneal Dialysis Procedures:

- Will educate the patient to report evidence or concerns of peritoneal catheter blockage as evidenced by a change in inflow and/or outflow of dialysis solution.
- Will irrigate the peritoneal catheter per program policy.
- Notify the Nephrologist when a blockage is suspected.

### 2.0 Definitions and Abbreviations

**Inability to either drain or infuse dialysis solution.** Causes:

- Blood or fibrin clots
- Air lock
- Constipation
- Catheter migration
- Omental wrap
- Kinked or clamped catheter

**Outflow failure:** The drainage volume is substantially less than the inflow volume and there is no evidence of pericatheter leakage. Usually occurs soon after catheter placement. Often preceded by irregular drainage, increased fibrin in the dialysate or constipation.

**Inflow failure:** Solution will not flow from the dialysate bag into the peritoneal cavity.

**Catheter irrigation:** procedure using a large syringe containing heparinized dialysis solution or normal saline in a push/pull technique to flush

fibrin or clots from the PD catheter and tubing.  
See procedure: PD catheter irrigation

**Thrombolytic agent:** may be indicated for the restoration of function of a blocked PD catheter. The thrombolytic agent requires a dwell period in the catheter in direct contact with the clot to initiate local fibrinolysis.

### 3.0 Equipment

Dependent on assessed cause.

## 4.0 Procedure and Rationale

PROCEDURE	RATIONALE
1. ASSESS reason for catheter blockage: <ul style="list-style-type: none"> <li>• Constipation</li> <li>• Catheter malposition</li> <li>• Omental wrap</li> <li>• Catheter kinks or closed clamps</li> <li>• Blood or fibrin clots</li> </ul>	
2. Anticipate need for flat plate of abdomen and lateral view x-ray.	Necessary to confirm or rule out causes of flow problems.
3. Treat assessed cause.	
Constipation <ul style="list-style-type: none"> <li>• Induce peristalsis or a bowel movement with laxatives or enemas according to program policy.</li> </ul>	Constipation often affects outflow of dialysate solution. Correction of constipation resolves approximately 50% of catheter outflow obstructions.
Catheter migration: <ul style="list-style-type: none"> <li>• Have patient assume knee chest position.</li> <li>• Encourage ambulation and activity.</li> <li>• Induce peristalsis.</li> </ul>	Catheter may migrate out of the pelvis post insertion due to omental wrapping, lack of peristalsis, shape memory of a catheter. Generally, affects outflow of dialysate solution. Activities that help to move the catheter tip low into the pelvis will aid in accessing the peritoneal fluid.
Fluid is in a small isolated area of the peritoneal cavity: <ul style="list-style-type: none"> <li>• Reposition patient</li> </ul>	May result in the catheter tip to be relocated into the pelvis.
Omental wrap: <ul style="list-style-type: none"> <li>• Anticipate omentectomy or partial omentectomy surgical procedure.</li> </ul>	May result in both inflow and outflow complications. Outflow difficulties are more common due to the potential blockage of the small holes on the distal end of the PD catheter with omentum. Instillation of PD fluid may push the omentum away from the small holes permitting inflow while draining of PD fluid may result in the omentum being drawn into the holes causing drainage issues.

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<p>Fibrin or blood clots:</p> <ul style="list-style-type: none"> <li>• Heparin 500u/L – 1000u/L may be added to peritoneal exchanges whenever fibrin plugs or stands of fibrin or blood is visible in the drained effluent.</li> <li>• Catheter irrigation may be required: see procedure titled <a href="#">Blocked PD Catheter: Irrigation Procedure</a>.</li> </ul>	<p>Heparin may be effective resolving blood or fibrin clots. Heparin is generally more useful prophylactically than therapeutically.</p> <p>A large syringe can be used to flush the catheter with heparinized saline or dialysis solution. If the catheter does not then drain, attempts can be made to gently aspirate using a push/pull technique. If pressure is felt, the attempt should be abandoned so that adjacent tissue is not pulled into the catheter.</p>
<p>Catheter kinking:</p> <ul style="list-style-type: none"> <li>• Remove exit site dressing and assess the external catheter for kinks or clamps and correct accordingly.</li> <li>• Change position of patient (side to side, sitting/standing).</li> <li>• Press gently on the subcutaneous tunnel to assess if flow increases.</li> <li>• Anticipate catheter repositioning or surgical replacement.</li> </ul>	<p>Subcutaneous tunnel blockage may result when the cuffs have been implanted too close to each other or the catheter is twisted during the tunneling procedure. Blockage due to internal kinking is apparent post insertion and affects both inflow and outflow.</p>

## 5.0 Patient Teaching Considerations

PATIENT TEACHING	RATIONALE
1. Assess drained effluent with each exchange for color, clarity and volume.	
2. Awareness of the importance of maintaining a bowel routine.	
3. Check for line kinks and or closed clamps as a first step if difficulty in draining is noted.	
4. Change position and increase ambulation if difficulty in draining is noted.	
5. Report changes in drained volume or speed of drainage when noted.	

## 6.0 Documentation Considerations

Document in the patient's chart:

- Assessed drainage problems
- Appearance and volume of drained effluent
- Treatment options provided
- Patient response to treatment options

## 7.0 Special Considerations: Interventional Guidelines

- (does not replace individualized care and clinical expertise)

**Catheter malfunction is more frequent during the first month after catheter implantation.**

- *Refer to individual PD program protocols for additional information and step by step instructions associated with catheter flush.*
- *Refer to individual PD program protocols for additional information and step by step instructions associated with use of thrombolytic agent.*

## 8.0 References

Counts, S.C. Core Curriculum for Nephrology Nursing 5th edition 2008; 828 - 829.

Ash S. Peritoneal Access Devices. Handbook of Dialysis, 4th Edition (2007) Lippincott Williams & Wilkins 356- 375

Piarano, B., Bailie, G., Bernardini, J. et al. ISPD Guidelines Recommendations. Peritoneal dialysis – related infections recommendations: 2005 update. Peritoneal Dialysis International 2005;25:107-31.

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## 11.0 Created

- August 2017

## 12.0 Reviewed and Revised

- August 2023