

## RENAL DIALYSIS: PERITONEAL

The peritoneum serves as the semipermeable membrane permitting transfer of nitrogenous wastes/toxins and fluid from the blood into a dialysate solution. Peritoneal dialysis is sometimes preferred because it uses a simpler technique and provides more gradual physiological changes than hemodialysis.

The manual single-bag method is usually done as an inpatient procedure with short dwell times of only 30–60 minutes and is repeated until desired effects are achieved. The most commonly used type of peritoneal dialysis is continuous ambulatory peritoneal dialysis (CAPD), which permits the patient to manage the procedure at home with bag and gravity flow, using a prolonged dwell time at night and a total of 3–5 cycles daily, 7 days a week. No machinery is required.

Continuous cycling peritoneal dialysis (CCPD) mechanically cycles shorter dwell times during night (3–6 cycles) with one 8-hr dwell time during daylight hours, increasing the patient's independence. An automated machine is required to infuse and drain dialysate at preset intervals.

### **NURSING DIAGNOSIS: Fluid Volume, risk for excess**

#### **Risk factors may include**

Inadequate osmotic gradient of dialysate

Fluid retention (malpositioned or kinked/clotted catheter, bowel distension; peritonitis, scarring of peritoneum)

Excessive PO/IV intake

#### **Possibly evidenced by**

[Not applicable; presence of signs and symptoms establishes an *actual* diagnosis.]

### **DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:**

#### **Fluid Balance (NOC)**

Demonstrate dialysate outflow exceeding/approximating infusion.

Experience no rapid weight gain, edema, or pulmonary congestion.

ACTIONS/INTERVENTIONS	RATIONALE
<p><b>Peritoneal Dialysis Therapy (NIC)</b></p> <p><b>Independent</b></p> <p>Maintain a record of inflow/outflow volumes and cumulative fluid balance.</p> <p>Record serial weights, compare with I&amp;O balance. Weigh patient when abdomen is empty of dialysate (consistent reference point).</p> <p>Assess patency of catheter, noting difficulty in draining. Note presence of fibrin strings/plugs.</p> <p>Check tubing for kinks; note placement of bottles/bags. Anchor catheter so that adequate inflow/outflow is achieved.</p>	<p>In most cases, the amount drained should equal or exceed the amount instilled. A positive balance indicates need of further evaluation.</p> <p>Serial body weights are an accurate indicator of fluid volume status. A positive fluid balance with an increase in weight indicates fluid retention.</p> <p>Slowing of flow rate/presence of fibrin suggests partial catheter occlusion requiring further evaluation/intervention.</p> <p>Improper functioning of equipment may result in retained fluid in abdomen and insufficient clearance of toxins.</p>

ACTIONS/INTERVENTIONS	RATIONALE
<p><b>Peritoneal Dialysis Therapy (NIC)</b></p> <p><b>Independent</b></p> <p>Turn from side to side, elevate the head of the bed, apply gentle pressure to the abdomen.</p> <p>Note abdominal distension associated with decreased bowel sounds, changes in stool consistency, reports of constipation.</p> <p>Monitor BP and pulse, noting hypertension, bounding pulses, neck vein distension, peripheral edema; measure CVP if available.</p> <p>Evaluate development of tachypnea, dyspnea, increased respiratory effort. Drain dialysate, and notify physician.</p> <p>Assess for headache, muscle cramps, mental confusion, disorientation.</p> <p><b>Collaborative</b></p> <p>Alter dialysate regimen as indicated.</p> <p>Monitor serum sodium.</p> <p>Add heparin to initial dialysis runs; assist with irrigation of catheter with heparinized saline.</p> <p>Maintain fluid restriction as indicated.</p>	<p>May enhance outflow of fluid when catheter is malpositioned/obstructed by the omentum.</p> <p>Bowel distension/constipation may impede outflow of effluent. (Refer to CP: Renal Dialysis; ND: Constipation, risk for.)</p> <p>Elevations indicate hypervolemia. Assess heart and breath sounds, noting S<sub>3</sub> and/or crackles, rhonchi. Fluid overload may potentiate HF/pulmonary edema.</p> <p>Abdominal distension/diaphragmatic compression may cause respiratory distress.</p> <p>Symptoms suggest hyponatremia or water intoxication.</p> <p>Changes may be needed in the glucose or sodium concentration to facilitate efficient dialysis.</p> <p>Hypernatremia may be present, although serum levels may reflect dilutional effect of fluid volume overload.</p> <p>May be useful in preventing fibrin clot formation, which can obstruct peritoneal catheter.</p> <p>Fluid restrictions may have to be continued to decrease fluid volume overload.</p>

<p><b>NURSING DIAGNOSIS: Fluid Volume, risk for deficient</b></p> <p><b>Risk factors may include</b> Use of hypertonic dialysate with excessive removal of fluid from circulating volume</p> <p><b>Possibly evidenced by</b> [Not applicable; presence of signs and symptoms establishes an <i>actual</i> diagnosis.]</p> <p><b>DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:</b></p> <p><b>Hydration (NOC)</b> Achieve desired alteration in fluid volume and weight with BP and electrolyte levels within acceptable range. Experience no symptoms of dehydration.</p>
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ACTIONS/INTERVENTIONS	RATIONALE
<p><b>Peritoneal Dialysis Therapy (NIC)</b></p> <p><b>Independent</b></p> <p>Maintain record of inflow/outflow volumes and individual/cumulative fluid balance.</p> <p>Adhere to schedule for draining dialysate from abdomen.</p> <p>Weigh when abdomen is empty, following initial 6–10 runs, then as indicated.</p> <p>Monitor BP (lying and sitting) and pulse. Note level of jugular pulsation.</p> <p>Note reports of dizziness, nausea, increasing thirst.</p> <p>Inspect mucous membranes, evaluate skin turgor, peripheral pulses, capillary refill.</p> <p><b>Collaborative</b></p> <p>Monitor laboratory studies as indicated, e.g.:</p> <p style="padding-left: 40px;">Serum sodium and glucose levels;</p> <p style="padding-left: 40px;">Serum potassium levels.</p>	<p>Provides information about the status of patient’s loss or gain at the end of each exchange.</p> <p>Prolonged dwell times, especially when 4.5% glucose solution is used, may cause excessive fluid loss.</p> <p>Detects rate of fluid removal by comparison with baseline body weight.</p> <p>Decreased BP, postural hypotension, and tachycardia are early signs of hypovolemia.</p> <p>May indicate hypovolemia/hyperosmolar syndrome.</p> <p>Dry mucous membranes, poor skin turgor and diminished pulses/capillary refill are indicators of dehydration and need for increased intake/changes in strength of dialysate.</p> <p>Hypertonic solutions may cause hypernatremia by removing more water than sodium. In addition, dextrose may be absorbed from the dialysate, thereby elevating serum glucose.</p> <p>Hypokalemia may occur and can cause cardiac dysrhythmias.</p>

<p><b>NURSING DIAGNOSIS: Trauma, risk for</b></p> <p><b>Risk factors may include</b></p> <p>Catheter inserted into peritoneal cavity</p> <p>Site near the bowel/bladder with potential for perforation during insertion or by manipulation of the catheter</p> <p><b>Possibly evidenced by</b></p> <p>[Not applicable; presence of signs and symptoms establishes an <i>actual</i> diagnosis.]</p> <p><b>DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:</b></p> <p><b>Risk Control (NOC)</b></p> <p>Experience no injury to bowel or bladder.</p>
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ACTIONS/INTERVENTIONS	RATIONALE
<p><b>Peritoneal Dialysis Therapy (NIC)</b></p> <p><b>Independent</b></p> <p>Have patient empty bladder before peritoneal catheter insertion if indwelling catheter not present.</p> <p>Anchor catheter/tubing with tape. Stress importance of patient avoiding pulling/pushing on catheter. Restrain hands if indicated.</p> <p>Note presence of fecal material in dialysate effluent or strong urge to defecate, accompanied by severe, watery diarrhea.</p> <p>Note reports of intense urge to void, or large urine output following initiation of dialysis run. Test urine for sugar as indicated.</p> <p>Stop dialysis if there is evidence of bowel/bladder perforation, leaving peritoneal catheter in place.</p>	<p>An empty bladder is more distant from insertion site and reduces likelihood of being punctured during catheter insertion.</p> <p>Reduces risk of trauma by manipulation of the catheter.</p> <p>Suggests bowel perforation with mixing of dialysate and bowel contents.</p> <p>Suggests bladder perforation with dialysate leaking into bladder. Presence of glucose-containing dialysate in the bladder will elevate glucose level of urine.</p> <p>Prompt action will prevent further injury. Immediate surgical repair may be required. Leaving catheter in place facilitates diagnosing/locating the perforation.</p>

<p><b>NURSING DIAGNOSIS: Pain,acute</b></p> <p><b>May be related to</b></p> <p>Insertion of catheter through abdominal wall/catheter irritation, improper catheter placement</p> <p>Irritation/infection within the peritoneal cavity</p> <p>Infusion of cold or acidic dialysate, abdominal distension, rapid infusion of dialysate</p> <p><b>Possibly evidenced by</b></p> <p>Reports of pain</p> <p>Self-focusing</p> <p>Guarding/distraction behaviors, restlessness</p> <p><b>DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:</b></p> <p><b>Pain Level (NOC)</b></p> <p>Verbalize decrease of pain/discomfort.</p> <p>Demonstrate relaxed posture/facial expression, be able to sleep/rest appropriately.</p>
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ACTIONS/INTERVENTIONS	RATIONALE
<p><b>Pain Management (NIC)</b></p> <p><b>Independent</b></p> <p>Investigate patient's reports of pain; note intensity (0–10), location, and precipitating factors.</p> <p>Explain that initial discomfort usually subsides after the first few exchanges.</p> <p>Monitor for pain that begins during inflow and continues during equilibration phase. Slow infusion rate as indicated.</p> <p>Note reports of discomfort that is most pronounced near the end of inflow and instill no more than 2000 mL of solution at a single time.</p> <p>Prevent air from entering peritoneal cavity during infusion. Note report of pain in area of shoulder blade.</p> <p>Elevate head of bed at intervals. Turn patient from side to side. Provide back care and tissue massage.</p> <p>Warm dialysate to body temperature before infusing.</p> <p>Monitor for severe/continuous abdominal pain and temperature elevation (especially after dialysis has been discontinued).</p> <p>Encourage use of relaxation techniques, e.g., deep-breathing exercises, guided imagery, visualization. Provide diversional activities.</p>	<p>Assists in identification of source of pain and appropriate interventions.</p> <p>Information may reduce anxiety and promote relaxation during procedure.</p> <p>Pain occurs at these times if acidic dialysate causes chemical irritation of peritoneal membrane.</p> <p>Likely the result of abdominal distension from dialysate. Amount of infusion may have to be decreased initially.</p> <p>Inadvertent introduction of air into the abdomen irritates the diaphragm and results in referred pain to shoulder blade. This type of discomfort may also be reported during initiation of therapy/during infusions and usually is related to stretching/irritation of the diaphragm with abdominal distension. Smaller exchange volumes may be required until patient adjusts.</p> <p>Position changes and gentle massage may relieve abdominal and general muscle discomfort.</p> <p>Warming the solution increases the rate of urea removal by dilating peritoneal vessels. Cold dialysate causes vasoconstriction, which can cause discomfort and/or excessively lower the core body temperature, precipitating cardiac arrest.</p> <p>May indicate developing peritonitis. (Refer to ND: Infection, risk for [peritonitis], following.)</p> <p>Redirects attention, promotes sense of control.</p>
<p><b>Collaborative</b></p> <p>Administer analgesics.</p> <p>Add sodium hydroxide to dialysate, if indicated.</p>	<p>Relieves pain and discomfort.</p> <p>Occasionally used to alter pH if patient is not tolerating acidic dialysate.</p>

**NURSING DIAGNOSIS: Infection, risk for [peritonitis]**

**Risk factors may include**

Contamination of the catheter during insertion, periodic changing of tubings/bags  
Skin contaminants at catheter insertion site  
Sterile peritonitis (response to the composition of dialysate)

**Possibly evidenced by**

[Not applicable; presence of signs and symptoms establishes an *actual* diagnosis.]

**DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:**

**Dialysis Access Integrity (NOC)**

Identify interventions to prevent/reduce risk of infection.  
Experience no signs/symptoms of infection.

ACTIONS/INTERVENTIONS	RATIONALE
<p><b>Infection Protection (NIC)</b></p> <p><b>Independent</b></p> <p>Observe meticulous aseptic techniques and wear masks during catheter insertion, dressing changes, and whenever the system is opened. Change tubings per protocol.</p> <p>Change dressings as indicated, being careful not to dislodge the catheter. Note character, color, odor, or drainage from around insertion site.</p> <p>Observe color and clarity of effluent.</p> <p>Apply povidone-iodine (Betadine) barrier in distal, clamped portion of catheter when intermittent dialysis therapy used.</p> <p>Investigate reports of nausea/vomiting, increased/severe abdominal pain; rebound tenderness, fever, and leukocytosis.</p>	<p>Prevents the introduction of organisms and airborne contamination that may cause infection.</p> <p>Moist environment promotes bacterial growth. Purulent drainage at insertion site suggests presence of local infection. <i>Note:</i> Polyurethane adhesive film (e.g., blister film) dressings have been found to decrease amount of pressure on catheter and exit site as well as incidence of site infections.</p> <p>Cloudy effluent is suggestive of peritoneal infection.</p> <p>Reduces risk of bacterial entry through catheter between dialysis treatments when catheter is disconnected from closed system.</p> <p>Signs/symptoms suggesting peritonitis, requiring prompt intervention.</p>
<p><b>Collaborative</b></p> <p>Monitor WBC count of effluent.</p> <p>Obtain specimens of blood, effluent, and/or drainage from insertion site as indicated for culture/sensitivity.</p> <p>Monitor renal clearance/BUN, Cr.</p> <p>Administer antibiotics systemically or in dialysate as indicated.</p>	<p>Presence of WBCs initially may reflect normal response to a foreign substance; however, continued/new elevation suggests developing infection.</p> <p>Identifies types of organism(s) present, choice of interventions.</p> <p>Choice and dosage of antibiotics are influenced by level of renal function.</p> <p>Treats infection, prevents sepsis.</p>

**NURSING DIAGNOSIS: Breathing Pattern, risk for ineffective**

**Risk factors may include**

Abdominal pressure/restricted diaphragmatic excursion; rapid infusion of dialysate; pain  
Inflammatory process (e.g., atelectasis/pneumonia)

**Possibly evidenced by**

[Not applicable; presence of signs and symptoms establishes an *actual* diagnosis.]

**DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:**

**Respiratory Status: Ventilation (NOC)**

Display an effective respiratory pattern with clear breath sounds, ABGs within patient's normal range.  
Experience no signs of dyspnea/cyanosis.

ACTIONS/INTERVENTIONS	RATIONALE
<p><b>Respiratory Monitoring (NIC)</b></p> <p><b>Independent</b></p> <p>Monitor respiratory rate/effort. Reduce infusion rate if dyspnea is present.</p> <p>Auscultate lungs, noting decreased, absent, or adventitious breath sounds, e.g., crackles/wheezes/rhonchi.</p> <p>Note character, amount, and color of secretions.</p> <p>Elevate head of bed or have patient sit up in chair. Promote deep-breathing exercises and coughing.</p> <p><b>Collaborative</b></p> <p>Review ABGs/pulse oximetry and serial chest x-rays.</p> <p>Administer supplemental O<sub>2</sub> as indicated.</p> <p>Administer analgesics as indicated.</p>	<p>Tachypnea, dyspnea, shortness of breath, and shallow breathing during dialysis suggest diaphragmatic pressure from distended peritoneal cavity or may indicate developing complications.</p> <p>Decreased areas of ventilation suggest presence of atelectasis, whereas adventitious sounds may suggest fluid overload, retained secretions, or infection.</p> <p>Patient is susceptible to pulmonary infections as a result of depressed cough reflex and respiratory effort, increased viscosity of secretions, as well as altered immune response and chronic/debilitating disease.</p> <p>Facilitates chest expansion/ventilation and mobilization of secretions.</p> <p>Changes in Pao<sub>2</sub> and Paco<sub>2</sub> and appearance of infiltrates/congestion on chest x-ray suggest developing pulmonary problems.</p> <p>Maximizes oxygen for vascular uptake, preventing/lessening hypoxia.</p> <p>Alleviates pain, promotes comfortable breathing, maximal cough effort.</p>