

Peritoneal dialysis



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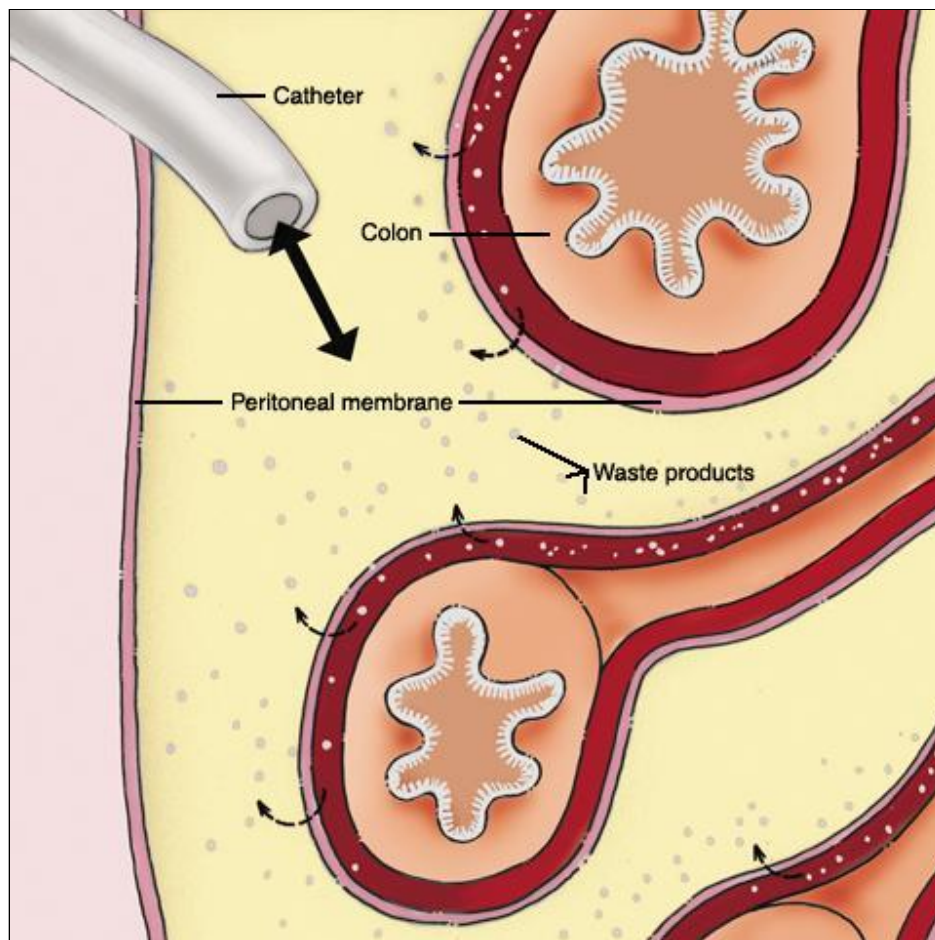
Revised: September 15, 2025

■ Introduction

Peritoneal dialysis, a treatment for kidney failure, removes fluids and toxins from the blood and regulates electrolyte levels. Peritoneal dialysis gives the patient more independence, requires less travel for treatments, and results in more stable fluid and electrolyte levels than conventional hemodialysis. Because the patient can resume normal daily activities between dialysate solution changes, peritoneal dialysis helps the patient return to a near-normal lifestyle. It also costs less than hemodialysis.

Peritoneal dialysis requires insertion of a peritoneal dialysis catheter (such as a Tenckhoff catheter) into the peritoneal space in the abdomen.^[1] The practitioner inserts a catheter with the patient under general or local anesthesia, sutures it in place, and tunnels the distal portion subcutaneously to the skin surface. There, it serves as a port for the dialysate solution—the solution instilled into the peritoneal cavity through the catheter—which draws waste products, excess fluid, and electrolytes from the blood across the semipermeable peritoneal membrane.^[2] After a prescribed period, dialysate drains from the peritoneal cavity. (See [How peritoneal dialysis works.](#))

HOW PERITONEAL DIALYSIS WORKS
Peritoneal dialysis works through a combination of diffusion and osmosis. Diffusion In diffusion, particles move through a semipermeable membrane from an area of high-solute concentration to an area of low-solute concentration. In peritoneal dialysis, the water-based dialysate contains dextrose, sodium chloride, calcium, magnesium, acetate or lactate, and no waste products; this causes the waste products and excess electrolytes in the blood to cross through the semipermeable peritoneal membrane into the dialysate. Removing the waste-filled dialysate and replacing it with fresh solution keeps the waste concentration low and encourages further diffusion. Osmosis In osmosis, fluids move through a semipermeable membrane from an area of low-solute concentration to an area of high-solute concentration. In peritoneal dialysis, dextrose is added to the dialysate to give it a higher solute concentration than the blood, creating a high osmotic gradient. Water migrates from the blood through the membrane at the beginning of each infusion, when the osmotic gradient is highest.



Each solution change is called an *exchange* or *cycle*. Each exchange or cycle involves three phases:

- During the instillation (fill) phase, dialysate infuses through the catheter into the abdominal cavity, typically requiring 5 to 10 minutes for the dialysate to infuse and fill the abdominal cavity
- During the dwell phase, the dialysate remains in the abdominal cavity, allowing osmosis and diffusion to occur. The dwell time varies (as prescribed and determined by the patient's condition and delivery method), but typically ranges from 30 minutes to 4 hours
- In the drain phase, dialysate and excess extracellular fluid, waste, and electrolytes drain from the abdominal cavity via the catheter, typically over 15 to 20 minutes.^[2]

If this is the patient's first time receiving peritoneal dialysis, the instillation phase is first. For patients who have been receiving therapy, the drain phase must be completed first, followed by the instillation phase and then the dwell phase.^[2] The procedure is indicated for patients with stage 5 chronic kidney disease or an earlier stage of kidney disease when signs and symptoms become severe.^{[3][4]} Patients with acute kidney injury, hemodialysis vascular access issues, chronic heart failure, coagulation abnormalities, or ischemic heart disease can also benefit from peritoneal dialysis.^{[4][5]}

Methods of peritoneal dialysis include manual and automated methods.^[2] The manual method requires a tubing and bag setup that fills and drains by gravity. The automated method requires a machine that uses gravity or a pump to drain dialysate. (See [Peritoneal dialysis machine](#).)

Contraindications to peritoneal dialysis include an inability to perform self-care or the absence of a capable caregiver to assist with peritoneal dialysis after discharge, recent major intra-abdominal surgery, and body mass index greater than 40.^[6] Extraperitoneal procedures, such as nephrectomy,

aren't necessarily contraindications.^[6] Contraindications to urgent peritoneal dialysis for acute kidney injury include ileus, appendicitis, bowel ischemia, intestinal obstruction or perforation, bacterial or fungal peritonitis, new aortic grafts, abdominal or diaphragmatic fistulae, abdominal burns, cellulitis, severe hypercatabolic states, and profound metabolic acidosis.^[6]

The practitioner may insert the peritoneal catheter in the operating room or interventional radiology department under sterile conditions. Peritoneal dialysis may be performed by a nephrology nurse, acute care hemodialysis nurse, acute care dialysis technician with nurse supervision, critical care nurse, expert medical-surgical nurse, or contracted nurse from an agency who's trained and competent to perform peritoneal dialysis.^[6] Nurses should know who may perform peritoneal dialysis at their facilities.

■ Equipment

- Antiseptic solution (povidone-iodine, hypochlorite, or chlorhexidine)^{[2][7]}
- Disinfectant pad
- Facility-approved disinfectant
- Facility-approved pain assessment tool
- Gloves
- Heating pad or commercial warmer
- Hypoallergenic tape or catheter securement device
- Intake and output monitoring supplies
- IV pole
- Masks
- Peritoneal dialysis administration set (usually a closed delivery system with attached drainage bag)^[2]
- Prescribed dialysate solution
- Scale
- Sterile 4" × 4" (10- × 10-cm) gauze pads
- Sterile drapes
- Sterile gloves
- Transfer set
- Stethoscope
- Vital signs monitoring equipment
- Optional: labels, laboratory biohazard transport bag, laboratory request form, other personal protective equipment, peritoneal dialysis machine, prescribed medication, specimen container or sterile culture tube with transport medium, specimen label, sterile cap or disinfectant-containing disconnect cap, sterile container, sterile swabs



EQUIPMENT

PERITONEAL DIALYSIS MACHINE

A peritoneal dialysis machine, also known as a *cycler*, is a machine that has multiple functions within the administration of peritoneal dialysis. Cycler functions can vary based on the model and manufacturer, but generally include warming fluid, delivering the dialysate using a preset inflow volume, allowing the dialysate to dwell for a specific period using a preset dwell time, and allowing for a drain cycle using a predetermined volume or time.^[6] The cycler uses disposable tubing and can be set up by the patient, nurse, or caregiver. Some cyclers can communicate with the clinic or

nurse, sharing details of each dialysis session.^[6] Follow the manufacturer's instructions for the cyclor that you're using.^[6]

Commercially prepared sterile continuous ambulatory peritoneal dialysis kits are available.

■ Preparation of Equipment

Inspect all equipment and supplies. If a product is expired, is defective, or has compromised integrity, remove it from patient use, label it as expired or defective, and report the expiration or defect as directed by your facility.

Perform hand hygiene.^{[8] [9] [10] [11] [12] [13]} Check each dialysate solution bag *to make sure that the solution is clear, matches the practitioner's order, and contains the correct volume and concentration of dextrose; the expiration date hasn't passed; and the bag is intact.* If medications are prescribed for the peritoneal dialysis solution and the pharmacy can't add them into the dialysis solution bag using a laminar airflow hood, add them using sterile technique *to prevent bacterial and fungal contamination of the solution bag.*^[6] (See the "[Peritoneal dialysis, adding medications to dialysate](#)" procedure.)^[6] Warm the dialysate solution bags to body temperature using dry heat *to prevent patient discomfort and abdominal pain.*^{[1] [14]}

■ Implementation

- Avoid distractions and interruptions when preparing and administering dialysate solution *to prevent administration errors.*^{[15] [16]}
- Verify the practitioner's order, which should include the number of daily exchanges, frequency of exchanges, fill volume, dialysis solution type, dextrose and calcium concentrations, and added medications.^{[2] [6] [17] [18] [19] [20]}
- Review the patient's medical record for primary kidney disease and other comorbid conditions, response to previous peritoneal dialysis treatments (if applicable), medication history, and pertinent laboratory test results (blood urea nitrogen, serum creatinine, albumin, bicarbonate, glucose, potassium, and hemoglobin levels; hematocrit; and white blood cell and platelet counts).^{[2] [3]}
- Gather and prepare the necessary equipment and supplies.
- Perform hand hygiene.^{[8] [9] [10] [11] [12] [13]}
- Confirm the patient's identity using at least two patient identifiers.^[21]
- Close the door to the room or pull the curtain around the bed *to minimize airborne contaminants.*
- Provide privacy.^{[22] [23] [24] [25]}
- Explain the procedure to the patient and family (if appropriate) according to their individual communication and learning needs *to increase their understanding, allay their fears, and enhance cooperation.*^[26] If the patient previously received peritoneal dialysis, ask about the patient's response to the previous treatment.
- Raise the bed to waist level before providing care *to prevent caregiver back strain.*^[27]
- Perform hand hygiene.^{[8] [9] [10] [11] [12] [13]}
- Obtain the patient's vital signs *for baseline comparison.* Report abnormal findings to the practitioner.
- Assess the patient's respiratory and abdominal status.^[2] Assess for signs of dehydration and unusual insensible fluid loss.^[6]

- Obtain the patient's baseline weight (in kilograms) before initiating peritoneal dialysis therapy and then weigh the patient daily. Obtain the patient's weight consistently with or without fluid dwelling. Use the same scale and make sure that the patient wears similar clothing *to ensure consistency for accurate weight measurement.*^[6]
- Compare the dialysate solution label to the order in the patient's medical record.^{[17] [18] [19] [20]}
- Check the patient's medical record for an allergy or contraindication to the prescribed dialysate solution or its additives. If an allergy or contraindication exists, don't administer the dialysate solution and notify the practitioner.^{[17] [18] [19] [20]}
- Visually inspect the dialysate solution for particles, discoloration, or other loss of integrity. Don't administer the dialysate solution if integrity is compromised.^{[17] [18] [19] [20]}
- Discuss any unresolved concerns about the dialysate solution with the patient's practitioner.^{[17] [18] [19] [20]}
- Screen for and assess the patient's pain using facility-defined criteria that are consistent with the patient's age, condition, and ability to understand.^[28]
- Treat the patient's pain, as needed and ordered, using nonpharmacologic, pharmacologic, or a combination of approaches. Base the treatment plan on evidence-based practices and the patient's clinical condition, past medical history, and pain management goals.^[28]
- Clean and disinfect your identified work surface.^[2]
- If you're using an automated peritoneal dialysis machine, program the machine as prescribed and according to the manufacturer's instructions for use.

For the instillation phase

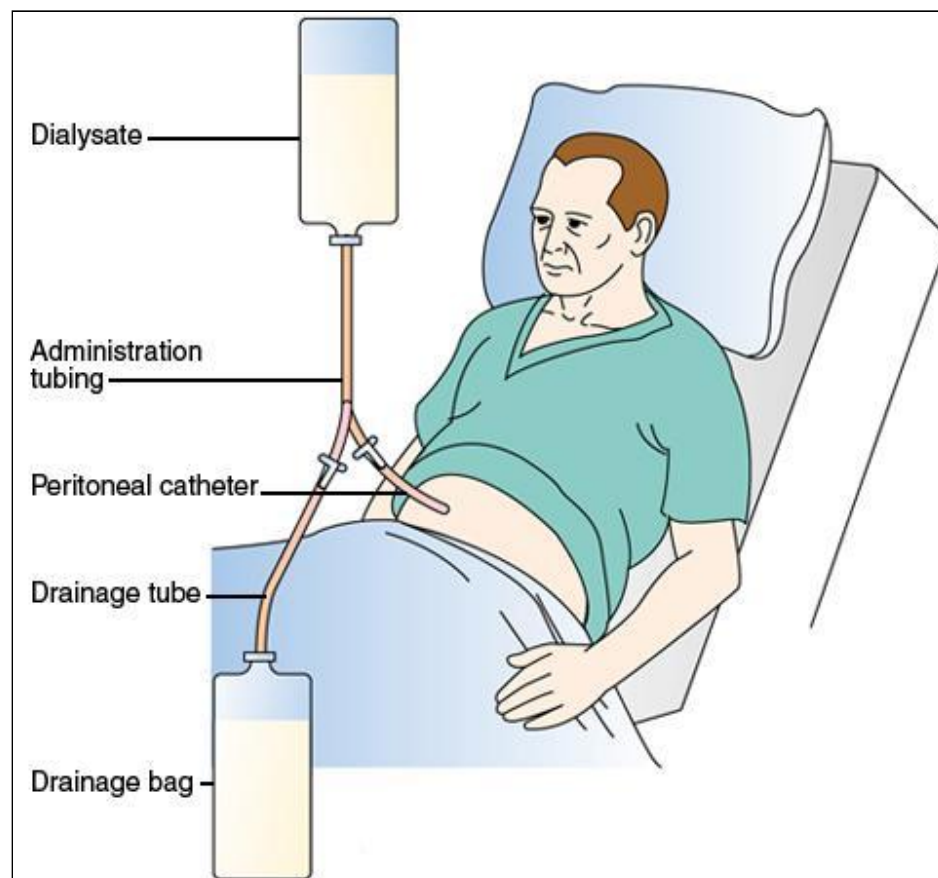
- Put on a mask and help the patient and anyone else who remains in the room put on a mask.^{[2] [6]}
- Perform hand hygiene.^{[8] [9] [10] [11] [12] [13]}
- Position the patient with the head and upper torso elevated during dialysate infusion and drainage, if possible, *to prevent respiratory compromise when infusing dialysate and maximize gravity's effect when draining dialysate.*^[6] Place the patient in a supine position if peritoneal dialysis becomes necessary during the first 2 weeks after catheter insertion.
- Perform hand hygiene.^{[8] [9] [10] [11] [12] [13]}
- Put on other personal protective equipment, as needed, *to comply with standard precautions.*^{[29] [30] [31]}
- Hang the dialysate bag on an IV pole and connect the peritoneal dialysis administration set to the dialysate. Prime the dialysis administration set tubing with the dialysate *to purge the system of air because air in the peritoneum can cause pain and interfere with filling.* Clamp the tubing.^[2]
- Place the drainage bag on a clean surface below the midabdominal area *to facilitate drainage.*^[2]
- Remove and discard your gloves, if worn.^[30]
- Perform hand hygiene.^{[8] [9] [10] [11] [12] [13]}
- Prepare a sterile field using a sterile drape. Open a sterile container package or sterile 4" × 4" (10- × 10-cm) gauze pads. Pour antiseptic solution into a sterile container or onto the gauze pads.^[2]
- Perform hand hygiene.^{[8] [9] [10] [11] [12] [13]}
- Put on sterile gloves.^{[2] [6] [29] [30]}
- If the patient doesn't have a transfer set attached to the peritoneal catheter, scrub the catheter-cap connection using a gauze pad soaked in antiseptic solution.^[6] The antiseptic solution effectiveness depends on the length of scrub time. Povidone-iodine requires 2 to 3 minutes,

hypochlorite requires 1 minute, and chlorhexidine requires 30 seconds. Follow the manufacturer's instructions for the correct disinfectant to use.^[2]

- Wrap another antiseptic-soaked gauze pad around the distal end of the catheter–cap connection and leave it in place for 5 minutes *to reduce the transmission of microorganisms*.^[6]
- Remove and discard the used gauze pad and let the catheter-cap connection dry.^{[2] [6] [30]}
- Remove the cap and wrap another antiseptic-soaked gauze pad around the catheter adapter *to disinfect the open catheter adapter*.^[6]
- Using sterile technique, attach the transfer set. Be sure to secure the luer-lock connector tightly.^[6]
- If the patient already has a transfer set attached to the peritoneal catheter, scrub the area from the cap to the roller or twist clamp as directed by your facility. The antiseptic solution effectiveness depends on the length of scrub time. Povidone-iodine requires 2 to 3 minutes, hypochlorite requires 1 minute, and chlorhexidine requires 30 seconds. Follow the manufacturer's instructions for the correct disinfectant to use.^[2]
- Using sterile technique, attach the dialysate administration set to the transfer set. Be sure to secure the luer-lock connector tightly.^[6] Follow facility guidelines for further disinfection of the transfer set, if required.
- Trace the tubing from the patient to its point of origin *to make sure that you're connecting the tubing to the proper port*.^{[32] [33]} (See [Setup for peritoneal dialysis](#).)

SETUP FOR PERITONEAL DIALYSIS

This illustration shows the proper setup of the peritoneal dialysis administration set tubing for peritoneal dialysis.



- Unclamp the dialysate administration set tubing and flush the tubing *to reduce the risk of peritonitis for 3 to 5 seconds*, and then clamp the drainage bag tubing.^[34] Unclamp the transfer set and instill the dialysate, as ordered. Alternatively, unclamp the catheter and let the peritoneal dialysis machine instill the dialysate.^[2]
- Monitor the flow of the dialysate, making sure that the catheter isn't kinked or occluded.
- Allow the patient and anyone else in the room to remove and discard their masks.^[30]
- Return the bed to the lowest position *to prevent falls and maintain the patient's safety*.^[35]
- Monitor the patient closely for signs and symptoms of complications, such as abdominal pain, edema, respiratory distress, hypotension, fever, and hypothermia, and notify the practitioner as needed.^[2]
- Discard used supplies in appropriate receptacles.^[30]
- Remove and discard your gloves, mask, and, if worn, other personal protective equipment.^[30]
- Perform hand hygiene.^{[8] [9] [10] [11] [12] [13]}

For the dwell phase

- If you're using a manual system, after the dialysate infuses, close the clamp on the transfer set and peritoneal dialysis administration set tubing *to make sure that air doesn't enter the patient's peritoneum*.
- If the patient's schedule requires disconnection from the system during the dwell phase, disconnect the patient from the system.
 - Put on a mask and help the patient put on a mask.^[2]
 - Perform hand hygiene.^{[8] [9] [10] [11] [12] [13]}
 - Put on sterile gloves and, as needed, other personal protective equipment.^{[29] [30]}
 - Thoroughly disinfect the connection between the peritoneal dialysis administration set tubing and the transfer set, as directed by your facility and according to the manufacturer's instructions.
 - Using a sterile gauze pad, disconnect the peritoneal dialysis administration set tubing from the transfer set.
 - Using sterile technique with the transfer set tubing pointing downward, carefully connect the catheter cap to the transfer set.^[2]
 - Secure the catheter to the patient's abdomen.^[2]
 - Remove and discard the patient's mask.^[30]
 - Remove and discard your gloves, mask, and, if worn, other personal protective equipment.^[30]
 - Perform hand hygiene.^{[8] [9] [10] [11] [12] [13]}
- Allow the solution to dwell for the prescribed dwell time.
- Explain that the patient may resume normal activities during the prescribed dialysate dwell time.

For the drain phase

- If the patient was disconnected from the system during the prescribed dwell time, reconnect the peritoneal dialysis catheter to the system following the attachment steps after the prescribed dwell time elapses.
- If you're using a manual system, place the drainage bag below the patient's midabdominal area *to enhance gravity flow*. Unclamp the transfer set and drainage bag tubing and let the drainage

flow from the patient's peritoneal cavity.^[2] Alternatively, make sure that the peritoneal dialysis machine is functioning according to the drain phase.

- Assist the patient with position changes, as needed, *to facilitate drainage*.^[2]
- Monitor the patient's vital signs, as ordered or according to the patient's condition, *to assess for signs of hypovolemia (hypotension and tachycardia) and the sudden release of intraperitoneal pressure*. Notify the practitioner if the patient develops hypotension, tachycardia, or abdominal pain.^[2]
- Observe the appearance of the effluent. The fluid may be bloody or pink after catheter insertion but should become clear and colorless to light yellow after the first few exchanges. Suspect peritonitis if the fluid is cloudy; notify the practitioner and obtain a specimen for laboratory testing, if ordered.^[2] Label the specimen in the presence of the patient *to prevent mislabeling*.^[21] Place the specimen in a laboratory biohazard transport bag and send it to the laboratory immediately with the appropriate laboratory request form (if necessary).^[30]
- If you're using a manual system, clamp or close the transfer set and clamp the drainage bag tubing after the peritoneal fluid drains completely.^[2]
- Obtain the weight of the drainage bag or measure the drainage volume, as ordered, *to ensure adequate drainage and assess intake and output*.^[2]

Completing the procedure

- Perform hand hygiene.^{[8] [9] [10] [11] [12] [13]}
- Put on a mask and help the patient and anyone else in the room to put on a mask.^{[2] [6]}
- Raise the bed to waist level before providing care *to prevent caregiver back strain*.^[27]
- Perform hand hygiene.^{[8] [9] [10] [11] [12] [13]}
- Put on sterile gloves and, as needed, other personal protective equipment.^{[6] [29] [30]}
- Thoroughly disinfect the transfer set and dialysate administration set tubing connection as directed by your facility and according to the manufacturer's instructions.
- Disconnect the peritoneal dialysis administration set tubing from the transfer set.^[2]
- Visually inspect the disinfectant-containing cap *to ensure wetness*.
- With the transfer set pointing down, attach the cap to the transfer set using sterile no-touch technique.^[2]
- Secure the catheter and transfer set to the patient's abdomen using hypoallergenic tape or other securement device *to prevent accidental dislodgement*.^[2]
- Allow the patient and anyone else in the room to remove and discard their masks.^[30]
- Carefully monitor the patient's intake and output, including dialysis losses.^[2]
- Obtain the patient's postdialysis weight in kilograms.^[2]
- Reassess and respond to the patient's pain by evaluating the response to treatment and progress toward pain management goals. Assess for adverse reactions and risk factors for adverse events that may result from treatment.^[28]
- Return the bed to the lowest position *to prevent falls and maintain the patient's safety*.^[35]
- Discard used supplies in appropriate receptacles.^[30]
- Remove and discard your gloves, mask, and, if worn, other personal protective equipment.^[30]
- Perform hand hygiene.^{[8] [9] [10] [11] [12] [13]}
- Clean and disinfect your stethoscope with a disinfectant pad.^{[36] [37]}
- Perform hand hygiene.^{[8] [9] [10] [11] [12] [13]}
- Put on gloves and, as needed, other personal protective equipment *to comply with standard precautions*.^[30]

- Clean and disinfect other reusable equipment according to manufacturer's instructions *to prevent the spread of infection*.^{[36][37]}
- Remove and discard your gloves and, if worn, other personal protective equipment.^[30]
- Perform hand hygiene.^{[8][9][10][11][12][13]}
- Document the procedure.^{[38][39][40][41]}

■ Special Considerations

- Change the catheter dressing at an interval determined by your facility or whenever it becomes wet or soiled.^{[2][42]}
- *To prevent protein depletion*, the practitioner may order a high-protein diet or a protein supplement as well as serum albumin level monitoring.^[1]
- *To prevent respiratory distress*, place the patient in a position that maximizes lung expansion. Promote lung expansion through turning and deep-breathing exercises. In some patients, decreasing the dialysate volume may be necessary.

♦ **Clinical alert:** If the patient suffers severe respiratory distress during the dwell phase of dialysis, immediately drain the peritoneal cavity and notify the practitioner. Carefully monitor any patient on peritoneal dialysis who's being weaned from ventilation.♦

- Dialysate is available in three concentrations: 4.25%, 2.5%, and 1.5% dextrose.^[6] The 4.25% solution usually removes the largest amount of fluid from the blood *because its glucose concentration is the highest*.^[2] Carefully monitor the patient who receives this concentrated solution *to prevent excess fluid loss*. Also, some of the dextrose in the 4.25% solution may enter the patient's bloodstream, causing hyperglycemia severe enough to require an insulin injection or an insulin addition to the dialysate.^[2]
- Patients with a low serum potassium level may require the addition of potassium to the dialysate *to prevent further losses*.^[43]
- It's common to add heparin to the dialysate *to prevent the formation of fibrin in the dialysis catheter*.^{[2][43]}
- *To reduce the risk of peritonitis*, use strict sterile technique during catheter insertion, dialysate exchanges, and dressing changes. Ensure that all personnel and the patient wear masks in the room whenever you open or enter the dialysis system.^[2]
- Monitor the patient's hemodynamic status.^[2] Note the patient's fluid balance at the end of each infusion-dwell-drain cycle. (The fluid balance is positive if the patient retains fluid at the end of an exchange and negative if you recover more fluid than you instilled with the exchange.) Notify the practitioner if the patient retains 17 oz (500 mL) or more of fluid for three consecutive cycles or if the patient loses 34 oz (1 L) or more of fluid for three consecutive cycles.
- If dialysate instillation or drainage is slow or absent, check the tubing for kinks. You can also try raising the IV pole or repositioning the patient *to increase the inflow rate*. Repositioning the patient or applying manual pressure to the lateral aspects of the abdomen may also help increase drainage. If these maneuvers fail, notify the practitioner. The catheter may be positioned improperly, or fibrin may be obstructing the catheter.^[2]
- Always examine the drained fluid (effluent) of each exchange for color and clarity. Normally, the fluid is clear or pale yellow, but pink-tinged effluent may appear during the first three or four cycles.^[1] If the effluent remains pink-tinged or if it's grossly bloody, suspect bleeding into the peritoneal cavity and notify the practitioner.^[2] Also notify the practitioner if the effluent contains feces, which suggests bowel perforation, or if it's cloudy, which suggests peritonitis. The practitioner should also be notified if fibrin is present in the fluid. Obtain a specimen for culture

and sensitivity testing and Gram stain, as ordered. Place the specimen in a labeled specimen container, place the container in a laboratory biohazard transport bag, and send it to the laboratory with a laboratory request form (if necessary).^{[21][30]}

- Expect patient discomfort at the start of the procedure. If the patient experiences pain during the procedure, determine when it occurs, its quality and duration, and whether it radiates to other body parts and notify the practitioner.
 - Pain during infusion usually results from dialysate that's too cool or acidic.^[1]
 - Pain may also result from rapid instillation. Slowing the inflow rate may reduce the pain. Severe, diffuse pain with rebound tenderness and cloudy effluent may indicate peritoneal infection.^[1]
 - Pain that radiates to the shoulder commonly results from air accumulation under the diaphragm.
 - Severe, persistent perineal or rectal pain can result from improper catheter placement.
- Remember that a patient undergoing peritoneal dialysis commonly requires a great deal of assistance with daily care. *To minimize the patient's discomfort*, perform daily care during a drain phase in the cycle, when the abdomen is less distended.
- During and after dialysis, monitor the patient, including performing abdominal and respiratory assessments and assessing the patient's response to treatment.^[2]
- Monitor the vital signs according to the patient's condition and at an interval determined by your facility; *no evidence-based research indicates the best practice for frequency of vital signs*.^[44] Notify the practitioner of any abrupt changes in the patient's condition.
- Monitor the patient's fluid and electrolyte status.^[2] Report unexpected results to the practitioner and administer fluids and electrolytes, as prescribed.
- Check whether your facility has a clearly developed curriculum for peritoneal dialysis training.^[42]
- Support the patient with a potential alteration in body image and ability to live a satisfying lifestyle as a peritoneal dialysis patient. Encourage the patient and caregiver to build and use available support systems.^{[45][46]}
- Typically, the transfer set attached to the catheter is changed every 6 months; however, if contamination or damage occurs, the change may need to take place sooner.
- The Joint Commission issued a sentinel event alert related to managing risk during transition to new International Organization for Standardization tubing standards that were designed to prevent dangerous misconnections, which can lead to serious patient injury and death. During the transition, make sure to trace the tubing and catheter from the patient to the point of origin before connecting or reconnecting any device or infusion, at any care transition (such as a new setting or service), and as part of the handoff process; route tubes and catheters having different purposes in different standardized directions; when there are different access sites or several bags hanging, label the tubing at both the distal and proximal ends; use tubing and equipment only as intended; and store medications for different delivery routes in separate locations.^[33]

■ Patient Teaching

If the patient or a caregiver will perform peritoneal dialysis at home, begin teaching the purpose and indication for it; appropriate techniques for dialysate preparation, instillation, and drainage; and methods to troubleshoot complications. Ensure that the patient is aware of the importance of infection control, proper diet and hydration, routine care and maintenance of the catheter and insertion site, and adherence to the prescribed regimen.^[2] Review potential complications and instruct the patient or caregiver to immediately report cloudy effluent, abdominal pain, and fever and to save any drained, cloudy dialysate to bring to the clinic.^[34] Provide the patient with contact

information to report complications and additional educational information and resources, as indicated.

■ Complications

Complications associated with peritoneal dialysis may include:

- peritonitis
- mild abdominal pain or bloating
- intra-abdominal bleeding
- leakage around the catheter site
- inadequate drainage
- bowel perforation
- respiratory distress from increased pressure on the diaphragm
- atelectasis
- pneumonia
- pleural effusion
- gastroesophageal reflux
- aspiration
- protein depletion
- excessive fluid loss
 - hypovolemia
 - hypotension
 - shock
- excessive fluid retention
 - blood volume expansion
 - hypertension
 - peripheral edema
 - pulmonary edema
 - heart failure
- glucose imbalance
- electrolyte imbalances
- arrhythmias.²⁵

■ Documentation

Documentation associated with peritoneal dialysis includes:

- type and amount of dialysate infused
- type and amount of dialysate drained
- medications added to the dialysate solution
- color and character of the effluent
- daily weight
- fluid balance
- calculated total fluid balance after each exchange
- assessment findings
 - vital signs
 - tolerance of the treatment
 - other pertinent observations
 - pain
 - interventions performed
 - response to those interventions
- complications
 - name of the practitioner notified
 - date and time of practitioner notification
 - prescribed interventions
 - response to the interventions
- teaching provided to the patient and family (if applicable)
 - understanding of that teaching
 - follow-up teaching needed.

This procedure has been reviewed by the Academy of Medical-Surgical Nurses.



■ Related Procedures

- [Peritoneal dialysis catheter exit site care, pediatric](#)
- [Peritoneal dialysis, pediatric](#)

■ Related UpToDate Patient Teaching Handouts

- [Dialysis and diet](#)
- [Peritoneal dialysis](#)

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[\(Rating System for the Hierarchy of Evidence for Intervention/Treatment Questions\)](#)

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Rating System for the Hierarchy of Evidence for Intervention/Treatment Questions

The following leveling system is adapted from *Evidence-Based practice in nursing & healthcare: A guide to best practice*, Fifth edition, by Bernadette Mazurek Melnyk and Ellen Fineout-Overholt (2023).

Level I	Evidence from a systematic review or meta-analysis of all relevant randomized controlled trials (RCTs)
Level II	Evidence from well-designed single RCTs (experimental)

Level III	Evidence from well-designed nonrandomized controlled trials (quasi-experimental), systematic reviews of a complete body of evidence, and intervention studies using mixed methods
Level IV	Evidence from well-designed case-control and cohort studies (observational)
Level V	Evidence from systematic reviews of qualitative and descriptive studies
Level VI	Evidence from single descriptive and qualitative studies, evidence-based practice implementation, and quality improvement projects
Level VII	Evidence from expert opinion, expert committee reports, and literature reviews

Data from Gyatt, G., & Rennie D. (2002). Users' guides to the medical literature. American Medical Association; Harris, R. P., et al. (2001). Current methods of the U.S. Preventative Services Task Force: A review of the process. American Journal of Preventative Medicine, 20, 21-35.