CONTINUOUS
AMBULATORY
PERITONEAL DIALYSIS

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PERITONEAL DIALYSIS EXCHANGE

• A dialysis exchange removes old dialysis fluid from the peritoneal cavity and replaces it with new fluid. There are 3 major phases of a dialysis exchange.

• They are:
  
a. Drain

  • Fluid currently in your peritoneal cavity is drained through your peritoneal catheter into a bag
  • Fluid contains waste products and extra water from your blood
b. Fill

- New dialysis fluid flows into your peritoneal cavity through your peritoneal catheter

![Diagram showing new fluid flow into peritoneal cavity](clamp.png)

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c. Dwell

- Fluid stays in your peritoneal cavity
- Dialysis and excess fluid removal occurs during this time
PERITONEAL DIALYSIS EQUIPMENT

In order to understand how peritoneal dialysis works, it is important that you understand the following terms:

1. **Peritoneal Dialysis Catheter**
   - All peritoneal dialysis catheters are made of a soft, flexible plastic.
   - The catheter is tunneled through the skin and layers of fat and tissue below, into the peritoneal cavity.
2. Peritoneal Dialysis Fluid

- Dialysis fluid is a clear, sterile solution that is made up of sterile water, sugar and electrolytes.
- Dialysis Fluid comes in different strengths and volumes, with tubing attached as shown below.
3. **Dialysis Clamps**
   - Come in different colours
   - Work like scissors but are not sharp and will not cut the tubing
   - Not sterile but should be kept clean by washing in soap and water.

4. **Titanium Adapter**
   - Connects the Peritoneal Dialysis Catheter to the Transfer Set (see page 9).
   - Does not need changing.
   - Reduces wear and tear on your catheter.
5. **Transfer Set**

- A piece of tubing attached to the titanium adapter at end of the peritoneal dialysis catheter
- Tubing from the Twin Bag® tubing is attached when performing a dialysis exchange.
- Helps to avoid pulling and tugging on your catheter.
- Transfer Set will be changed every 6 months during your clinic visit.
- When Twist Clamp is open fluid flows in and out of the peritoneal cavity.
- When Twist Clamp is closed, no fluid will flow.
- Never open Twist Clamp unless connected to the dialysis fluid tubing.

**REMEMBER: DO NOT TOUCH THE END OF YOUR TRANSFER SET IF THE CAP IS OFF!**
6. Mini Cap

- This is a plastic cap with a medicated sponge inside, designed to keep germs from entering your catheter and peritoneal cavity.
- At the end of each dialysis exchange, put a **new** cap on the end of your transfer set.
- Always check the expiration date on the packaging and never use one that has expired.

**REMEMBER: NEVER TOUCH THE INSIDE OF THE CAP OR THE SPONGE!**

Sponge Soaked with Povidine-Iodine Solution
7. Masks

- Always wear a mask when doing your dialysis exchange.
- This prevents germs from your nose and mouth contaminating sterile parts of your equipment.
- Discard the mask after every use.

REMEMBER: ALWAYS PUT YOUR MASK ON BEFORE WASHING YOUR HANDS!
REMINDERS TO REDUCE THE RISK OF CONTAMINATION DURING EXCHANGE

1. Clean Work Area
   - Work area should be: well lit; no blowing air from drafts, open windows, or fans; clean and dry.
   - Counter tops, tables and equipment, must be cleaned before each use.
   - No pets in the area while connecting or disconnecting, or other treatment procedures, or where you store supplies and equipment.

![NO PETS Sign](image_url)
2. **Hand Washing**

- Hand washing is **very important** for you to reduce the risk of developing infections.
- Thorough hand washing will decrease the number of germs on your hands, but not all of them.
- Whenever you are going to do any procedures related to your dialysis treatment or peritoneal dialysis catheter, you **MUST** wash your hands for 2 minutes.

- Your hands will never be completely free of germs so hand washing does not replace the need to pay careful attention when doing procedures and follow all directions – **NO SHORTCUTS!**
WARMING DIALYSIS SOLUTION

• Cold dialysis fluid can be uncomfortable when used
• Warming dialysis fluid increases comfort
• Leave dialysis fluid bag in Over-pouch while heating
• Warm dialysis solution bag by placing it on a heating pad left on the LOW temperature setting
• Warm solution until it reaches a comfortable temperature – practice with your nurse so you know how warm they should be
• If the dialysis fluid is too hot, it can hurt your peritoneal membrane and cause you pain

1. NEVER WARM YOUR DIALYSIS FLUID BY Putting bag in warm water – germs may be found in warm water and contaminate connections and dialysis fluid

2. NEVER WARM YOUR DIALYSIS FLUID BY Using a microwave – it may cause overheating of the dialysis fluid and that could damage your peritoneal membrane.
DIALYSIS PRESCRIPTION

- You will be told how many exchanges you need to do per day (prescribed by Nephrologist) but generally it is 3 or 4 per day
- Try to do exchanges at regular intervals throughout the day about 4 – 6 hours apart
- CAPD is flexible so fit your exchanges into your schedule

EXAMPLE:

<table>
<thead>
<tr>
<th>Time</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morning</td>
<td>8:00 a.m.</td>
</tr>
<tr>
<td>Mid Day</td>
<td>1:00 p.m.</td>
</tr>
<tr>
<td>Evening</td>
<td>6:00 p.m.</td>
</tr>
<tr>
<td>Bedtime</td>
<td>11:00 p.m.</td>
</tr>
</tbody>
</table>

- If you are late doing an exchange, **DO NOT** skip the exchange…. Adjust your exchange times instead
- The number of exchanges prescribed may increase over time as your urine output decreases but this will be discussed with you by the nurse or Nephrologist
CAPD TWIN BAG PROCEDURE

• Follow this procedure **EXACTLY** when performing your peritoneal dialysis exchange

• Short cuts or changing the order of the steps may put you at risk for infection

**PREPARATION:**

1. Weigh yourself and record on your Daily Record sheet. (Example in “Assessment and Peritoneal Dialysis Fluid Selection” section)

2. Do your blood pressure - sitting and standing, and record on your Daily Record sheet.

3. If you have Diabetes, check your blood sugar and record on your Daily Record sheet.

4. Decide what bags to use for the day, using the Bag Selection Guide (found in “Assessment and Peritoneal Dialysis Fluid Selection” section) and record on your Daily Record sheet.
5. Warm the bags of dialysis fluid, using a heating pad.

6. Gather the following supplies:
   - Tape
   - Mask
   - Towel
   - 2 clamps
   - Mini Cap
   - Hand sanitizer
   - Optional: extra towel or paper towel to be used on floor under drain bag
PROCEDURE:

1. Assemble supplies on a clean surface.
2. Check Twin Bag® for: Solution strength, bag size and expiry date.
3. Check expiry date on Mini Caps.
4. **MASK**.
5. **WASH HANDS** as instructed.

   (Procedure found in “Infection Prevention and Exit Site Care” section)
a. Open Twin Bag® over-pouch.

b. Check full bag for leaks, clarity of solution and that all covers or tips are intact.

c. Untangle the tubing, and separate the full bag from the empty bag.

d. Apply one clamp to each, the fill and drain lines.

e. Place the towel on your lap.

f. Make sure the TWIST clamp on the transfer set is closed.
3. a. Remove pull ring from the Twin Bag® connector.

4. a. Remove Mini Cap from transfer set.
a. Immediately attach Twin Bag® connector to transfer set.

b. **AVOID TOUCHING THE ENDS.** (to prevent contamination/infection)

c. Hang the full bag on a hook.

d. Put the empty bag on the floor. You may put paper towel, cloth towel or Dialysis Fluid over-pouch may be used on floor under drain bag.
DRAIN

a. OPEN the TWIST clamp of your transfer set (the light blue and white twist clamp).

b. Remove clamp from drain line.

c. NOW, you are DRAINING.

d. After draining is complete, CLOSE the TWIST clamp on your transfer set.
**FLUSH**

a. Break green seal (located on the fill line (blue line—from the new dialysis fluid bag).

b. Open clamp on fill line for 5 seconds (Count 1-2-3), flushing fresh dialysis fluid into drain bag, to flush air out of the tubing.

c. **IMMEDIATELY CLAMP THE DRAIN LINE** (clear line).
**FILL**

a. Open transfer set TWIST clamp to fill.
b. After filling, place clamp on fill line.
c. Close transfer set TWIST clamp.
d. Make sure you have a mask on.
e. Sanitize your hands and allow to air dry.
9. Open Mini Cap package carefully so cap does not fall out of package.

10. Unscrew Twin Bag® connector from transfer set, keeping transfer set in your hand.
a. Immediately and carefully apply Mini Cap on your transfer set.
b. Secure the end of the transfer set to your abdomen, using tape or use an improvised stabilizing device.
a. Check fluid in the drain bag for clarity, colour, volume and fibrin.

b. Discard the used solution in the toilet and used tubing in the garbage.

c. Remove mask and discard.

d. If fibrin is present, add heparin to bag for next exchange.

e. If bag is cloudy or is an abnormal colour, contact the Home Dialysis Unit.

f. Record appearance and volume of fluid in the drain bag on your Daily Record sheet.
PROCEDURE FOR ADDING HEPARIN TO DIALYSIS FLUID

• Occasionally you may find fibrin in your peritoneal dialysis drainage (effluent)

• When you check the effluent in the bag, if fibrin is present, it will look like clumps or strands that are creamy white or pinkish in colour (If your catheter is new, fibrin may be red)

• If fibrin is present, Heparin is added to peritoneal dialysate to prevent blockage of your peritoneal dialysis catheter so fluid can flow in and out of the peritoneal cavity

• Fibrin may be present at any time but is more common if you have peritonitis

• **Fibrin alone is not a sign of peritonitis**

• Follow the procedure **EXACTLY**, as described on the next page, to avoid contaminating the dialysis fluid and causing peritonitis
PREPARATION:

1. Gather supplies:
   - Peritoneal Dialysis Fluid – Twin Bag
   - 3mL syringe with needle attached
   - 1 vial of 1:1000 Heparin
   - 1 Alcohol swab
   - Mask

2. Place equipment on clean work surface.

3. Put on mask.

4. Wash hands.

5. Check dialysis fluid as described in CAPD Twin Bag Procedure (page 19) and place on table, writing side down.

6. Check expiry date of heparin. If opening a new vial, write the date on the vial. Do not use after one month of its first use.
7. Remove black cap on Heparin vial, if it is still on.

8. Wipe rubber stopper of Heparin vial and the injection port on the Twin Bag Dialysis Fluid with alcohol swab and place swab under medication port on bag after so the clean port does not touch the table surface.
9. Open needle/syringe and tighten needle on syringe.

10. Remove cap from needle and pull back on plunger to ensure it moves freely and then push plunger until there is 0.5 (1/2mL) – 1.0mL of air left in the syringe.

11. Insert needle into centre of rubber stopper on vial and inject air into vial.
12. Hold vial so it is upside down ensuring that tip of needle is still covered by the liquid.

13. Gently pull back on the plunger of the syringe to draw up 0.5mL (1/2 mL) of heparin into syringe. If you have fibrin because of peritonitis, draw up 1.0mL of heparin into syringe.

14. Gently insert needle into middle of medication port on bag making sure that you don’t puncture the side of the port.

15. Inject heparin into bag by pressing on the syringe plunger.

16. When empty, remove needle from port and discard syringe and needle into sharps container. **Do not put the cap back on the needle.**

17. Gently shake the bag to mix the drug into the fluid.

18. Perform dialysis exchange as per procedure.
19. Record use of Heparin on Daily Dialysis Record.

**REMEMBER: DO NOT LET ANYTHING TOUCH THE NEEDLE OR YOU WILL GET AN INFECTION**

**DISPOSAL OF TUBING AND USED DIALYSIS FLUID**

- To dispose of used dialysis fluid, carefully cut bag and empty fluid into toilet
- Dispose of empty bag and used tubing in green or black garbage bag as per your local municipality guidelines with all other non-recyclable or compost garbage

**REMEMBER: WASH YOUR HANDS THOROUGHLY AFTER DISPOSING OF USED DIALYSIS FLUID AND TUBING**
PERITONEAL ADEQUACY AND EQUILIBRATION TESTING

• Peritoneal Dialysis Adequacy Testing
  o The Nephrologist will ask you to have an Peritoneal Adequacy Test done to help determine the effectiveness of your dialysis prescription
  o Usually performed 4-6 weeks after the beginning of peritoneal dialysis therapy and as required.
  o If your urine output is greater than 150mL/24 hours, your nurse will ask you to do a 24 hour urine collection; review the instruction sheet with you and give you a collection bottle.
  o You will also be asked to bring all bags of effluent and 24 hour urine collection on specified date to Home Dialysis Unit.
  o Blood will be taken within the same 24 hour period as urine and effluent collections are done.
  o Your nurse will review the instruction sheet (page 33) with you when arranging testing
CAPD 24 HOUR DIALYSATE COLLECTION

**Purpose:** To measure the amount of urea and creatinine removed by dialysis over 24 hours.

**How to collect:** Do your dialysis as normal. Make sure you drain completely for each exchange and then fill with the entire fill bag.

Collection Day – record the following information:

Morning weight _______ (lbs/kg) (full/empty).

<table>
<thead>
<tr>
<th>Exchange #1</th>
<th>Time drain started ______  fill finished ______</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fill bag ______ %. <strong>Discard drainage.</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exchange #2</th>
<th>Time drain started ______  fill finished ______</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fill bag ______ %. <strong>Save drainage.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Label it bag “A”</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exchange #3</th>
<th>Time drain started ______  fill finished ______</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fill bag ______ %. <strong>Save drainage.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Label it bag “B”</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exchange #4</th>
<th>Time drain started ______  fill finished ______</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fill bag ______ %. <strong>Save drainage.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Label it bag “C”</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exchange #5</th>
<th>Time drain started ______  fill finished ______</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fill bag ______ %. <strong>Save drainage.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Label it bag “D”</strong></td>
</tr>
</tbody>
</table>
Next Morning

*Exchange #1* Time drain started ______ fill finished ______
Fill bag ______%.
Save drainage. Label it bag “E“

- Do this exchange at the same time as you did the previous morning.

Note:
- **Tie off or clamp each tubing securely, to ensure there is no leak.** Place bags in a cool place once each exchange is completed.
- Bring in this sheet once collection for test complete, along with this paper.
- If you develop cloudy fluid, abdominal pain or your catheter is draining poorly on the day that you are to do this collection, contact your nurse as soon as possible.
• **Peritoneal Equilibration Testing**
  o The Nephrologist will ask you to have an Peritoneal Equilibration Test done to help determine the condition of your peritoneal membrane and how effectively it allows for the removal of toxins and fluid
  o Usually performed 4-6 weeks after the beginning of peritoneal dialysis therapy and as required.
  o Your nurse will review the instruction sheet (page 35) with you when arranging testing
  o You will be asked to perform your CAPD exchange using 2.5% dialysate or 1.5%, if blood pressure is low at bedtime exchange
  o You will need to come to Home Dialysis Unit with dialysate dwelling for a maximum of 10-12 hours
  o While in the Home Dialysis Unit the nurse will perform the test that has many steps including a modified exchange, taking samples from your drainage and blood tests
  o You will need to allow approximately 5 hours for the test to be completed
PERITONEAL EQUILIBRATION (P.E.) TEST

1. Your P.E. Test is booked for:________________ at __________________ a.m. The test will take at least 5 hours. Please come to the Home Dialysis Unit is located on the 8th Floor of the Cardinal Carter Wing, Room 8-090.

   * If your drain bags are cloudy or you have abdominal pain, please contact the Home Dialysis Unit. This test cannot be done if you have an infection but, you still have to come to the hospital to be assessed.

2. On __________________, you will need to do your bedtime exchange using a 2.5% 2L bag. It is important to drain completely before you fill with this bag.

   * If your blood pressure is too low or you feel dizzy at bedtime, you may use a 1.5% bag instead. Please remember to tell the nurse which bag you used.

3. On __________________, **DO NOT YOUR FIRST MORNING EXCHANGE.** When you get to the hospital, your nurse will do your dialysis exchange. If you have diabetes, discuss with your nurse whether you should eat your breakfast at home or, at the hospital. If you desire, your lunch will be provided.

   **PLEASE BRING WITH YOU, ALL MEDICATIONS THAT YOU WILL NEED TO TAKE DURING THIS TIME.**
MY GOALS:

______________________________________________

______________________________________________

______________________________________________

______________________________________________

______________________________________________

______________________________________________

______________________________________________

______________________________________________

______________________________________________

______________________________________________

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______________________________________________
IMPORTANT POINTS TO CONSIDER:

1. What should I do to prepare the area where I can do my exchange safely?

______________________________________________
______________________________________________
______________________________________________
______________________________________________
______________________________________________

2. Can I name all of the supplies that I will need to do my exchange?

______________________________________________
______________________________________________
______________________________________________
______________________________________________
______________________________________________
3. How should I warm my dialysis fluid bags?

4. How should I dispose of my effluent and used tubing?
5. When should I add Heparin to my dialysis fluid and for how long?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

6. Label the 2 diagrams.
REFERENCES


Toronto Western Hospital, University Health Network; Home Peritoneal Dialysis Unit Patient Manual, 8th edition, February 26, 2002