What is peritoneal dialysis?

It is a form of renal replacement therapy or dialysis where abdominal cavity is filled with a special fluid called dialysate which is very pure form of water mixed with electrolytes and dextrose (a form of sugar). Dialysate fluid is left in abdomen for several hours (usually 4-6 hours). During this process toxins move from numerous capillaries in peritoneal membrane into dialysate and body is cleared of harmful toxins. Thereafter fluid is drained out and abdomen is filled with fresh dialysate again. This process is repeated 4-5 times a day and need to be done every day. Volume of dialysate (1.5-3.0 L) and strength of dextrose (1.5%, 2.25%, 4.5%) is decided by your nephrologist.

For PD, it is also necessary to have a catheter in abdomen (some part of catheter is outside the abdomen) which is usually placed by a surgeon or a nephrologist. Patients are usually trained by healthcare providers to do PD at home. They also receive training to do PD very cleanly to avoid infections.

It is important to know that dialysis doesn’t help your kidneys to get better or cured of underlying disease. It doesn’t perform all the functions of a kidney such as formation of hormones (erythropoietin), vitamins (vitamin D) etc. Dialysis rather replaces only a part of kidney function such as clearing blood of toxins, excess fluid and electrolytes.
When kidney fails and dialysis is needed, it is a lifesaving treatment.

![Peritoneal Dialysis Diagram](https://upload.wikimedia.org/wikipedia/commons/thumb/0/00/Peritoneal_dialysis.png/260px-Peritoneal_dialysis.png)

**Image 1: Peritoneal Dialysis. Source of image: Wikipedia.org (image used under Creative Commons License)**

**What are different forms of peritoneal dialysis?**

PD can be performed either manually (continuous ambulatory peritoneal dialysis also known as CAPD) or using a machine (automated peritoneal dialysis also known as APD). Since PD is a slow and steady form of dialysis, it needs to be done continuously and 7 days a week. Biggest advantage of PD is independence and adaptable schedule and lifestyle.

**CAPD:** This form of PD is done manually at home by patient him/herself. Abdominal cavity is filled with fresh dialysate in morning and left for 4-6 hours while patient is free to do routine activities. Then, fluid containing toxins is drained and fresh dialysate is filled again (a process called EXCHANGE). This process is repeated 3-4 times in day and once before patient goes to sleep. Total of 4-5 exchange are done over 24 hours and needs to be done every day. Advantage of CAPD is good understanding of PD technique and underlying process. Disadvantage includes frequent exchanges which may be initially overwhelming.
APD: This form of PD is performed at home by patient using a machine. In the evening, patient connects catheter to a machine which automatically fills the abdomen with dialysate and drains after few hours. Machine repeats this process several times overnight. Dialysate volume and strength is decided by your nephrologist. Final dialysate volume is filled in abdomen in the morning before you wake up which you will need to manually drain after few hours. You may need to do an additional daytime manual exchange depending upon your clinical status. This process is also done every day.

What are potential complications related to peritoneal dialysis?

Patients may feel overwhelmed by the frequent dialysis procedures at home.

If not done cleanly, PD may lead to infection of peritoneal membrane (peritonitis).

Often peritoneal dialysate solutions use dextrose which is a form of sugar and can lead to elevated blood sugar level.

Long term inflammation of peritoneal membrane may occasionally cause a disease condition called encapsulated peritoneal sclerosis (EPS)

What precautions I need to take while on PD?

Limit daily oral fluid intake.

Avoid constipation.

Do not fill abdomen with dialysate until you drain the existing fluid completely.

Thoroughly wash and dry your hands and wear mask before performing an exchange.

Do not perform an exchange if catheter tip gets contaminated or any break in sterile technique is noted.

Use Flush before fill technique.
Discuss with your nephrologist for the application and choice of antibiotic around catheter exit site.

If you are diabetic and use Icodextrin (Extraneal) as dialysate, use only Extraneal compatible glucose sticks. If incompatible glucose stick is used, it can show FALSELY elevated blood glucose level and administration of insulin can cause serious drop in blood glucose level.

**You should report to your dialysis unit if**

a) Drained dialysate is noted found to be cloudy or not to be clear (usually you should be able to see through the fluid bag and even read)

b) Pain in abdomen, fever

c) Inability to drain dialysate from abdomen

d) Redness or pus around catheter exit site

e) You are travelling

**What are the other adjuvants to PD?**

Patients may require medications to control blood pressure, PTH and low hemoglobin.

You will get advice from dietician and social worker.

You will get information on kidney transplantation and referral for transplant evaluation if agreed by you.

You will get information on advance directives on resuscitation measures in future.

**How is PD treatment monitored?**

You will undergo regular blood tests assessing electrolytes, phosphorus, anemia and iron status and PTH (parathyroid hormone) level.
Kt/V (Target ≥1.7 per week) is commonly used test to measure adequacy of hemodialysis.

Know your Kt/V and be aware that you are receiving adequate hemodialysis.

**What are alternative options to PD?**

Patients may choose hemodialysis.

If suitable donor is available, kidney transplantation is the best form of renal replacement therapy.

You also may decide Not to choose any form of renal replacement therapy.

**How is peritoneal dialysis as compared to hemodialysis?**

Patient education and information is vital in deciding between hemodialysis and peritoneal dialysis (PD). Based upon current evidence and research, both hemodialysis and PD are known to be equivalent forms of therapy with individual benefits and risks.

**Benefits of PD:** It is performed by patients at home hence provide better lifestyle schedules. Patients don’t need to travel to dialysis unit and be dependent upon dialysis nurses for dialysis treatment. Since PD is slow but steady and continuous form of dialysis treatment, treatment schedule is somewhat similar to function of a normal kidney. It also offers freedom for more liberal intake of food and diet intake in contrast to hemodialysis patients who often need to limit potassium and phosphorus intake. Patients can travel without much restriction. Hence PD offers personal independence, lifestyle flexibility and dietary freedom.

**Concerns of PD:** Since, patients perform PD at home by themselves; they may feel overwhelmed by the dialysis procedure. If not done cleanly, it may lead to infection of peritoneal membrane (peritonitis). Often peritoneal dialysate solutions use dextrose which is a form of sugar and can lead to elevated blood sugar level. Long term
inflammation of peritoneal membrane may occasionally cause a disease condition called encapsulated peritoneal sclerosis (EPS).

**Benefit of hemodialysis:** Majority of patients in the United States choose hemodialysis as the mode of renal replacement therapy. Patients don’t have to worry about technical difficulties during a dialysis treatment. Patients with limited functional status or disabilities may feel more comfortable while receiving dialysis in a monitored setting. Patients may also see medical assistance during dialysis as promptly available. In the dialysis unit, patients may develop social relationship and bonding with other patients and healthcare providers.

**Concerns of hemodialysis:** If you receive in-center hemodialysis then you will need to travel to dialysis unit 3 times a week and spend approximately 4-5 hours for dialysis treatment. Dialysis schedule and timings are usually fixed hence doesn’t offer flexibility to daily lifestyle schedules. Patients may report feeling dizzy, fatigued and tired after a hemodialysis treatment. You also will need to follow a stricter dietary regimen restricting potassium, phosphorus and fluid intake. Using catheter as a dialysis access also increases risk of variety of serious complications.

**FURTHER SUGGESTED READING AND INFORMATION RESOURCES:**

1) Know more about Peritoneal Dialysis Options- The American Associations of Kidney Patients:
   

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