Kidneys & Kidney Failure 3

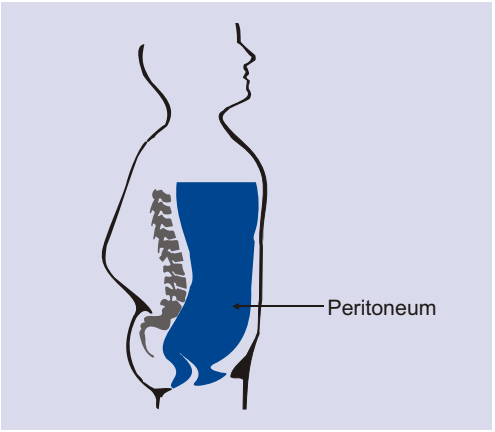
Peritoneal Dialysis

This booklet will help you know more about Peritoneal Dialysis (PD), its different forms and its process. The advantages and disadvantages of this therapy have also been described so that decision making becomes simple.

iRf

Peritoneal Dialysis is another method of removing excess of water and impurities from the blood. It is done with the help of **PERITONEUM,** which is a cavity, which surrounds the intestine and other organs in the stomach area.

In Peritoneal Dialysis (PD), the Peritoneal cavity acts as a semi-permeable membrane. PD can be done by the patient himself or by his attendant at home.



The three main types of peritoneal dialysis are

1. CAPD (Continuous Ambulatory Peritoneal Dial/sis)

This is the therapy in which dialysis is done through the peritoneum, manually, 3-4 times per day.

2. CCPD (Continuous Cyclic Peritoneal Dialysis)

This is the therapy in which dialysis is done through the peritoneum with the help of a cycler machine, usually 6-8 cycles overnight.

3. IPD (Intermittent Peritoneal Dialysis)

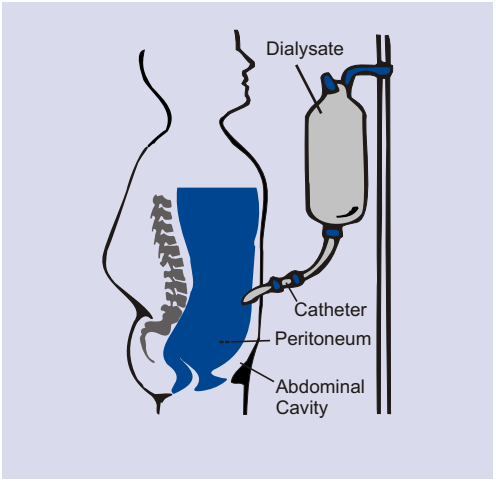
This is the therapy, which is mostly used to treat Acute Renal Failure when haemodialysis treatment is not possible. This is generally done in a hospital.

Today, there are almost one lakh patients taking peritoneum dialysis in the world.

The Process of Peritoneal Dialysis

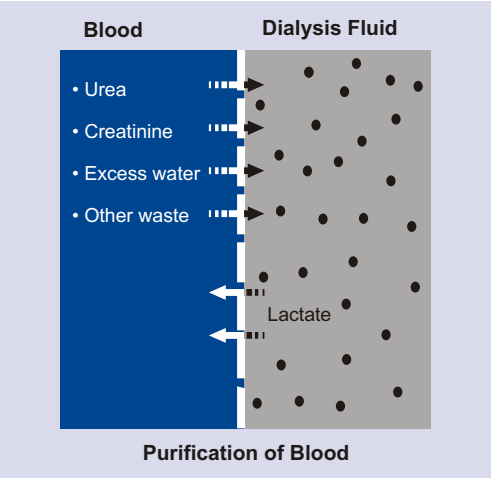
In PD, as in Haemodialysis, a dialysis solution is used to clean the blood. The dialysis solution is introduced and drained from the Peritoneal Cavity through a soft elastic tube called Catheter. Time between the filling and draining of the dialysis solution, in and from the Peritoneal cavity, is called the dwell time. During this time excess water and toxic wastes diffuse from blood across the peritoneal membrane into the dialysate because of the processes of Diffusion and Osmosis.

In PD, Diffusion helps to remove solutes e.g. urea, creatinine etc. Diffusion happens because there is a concentration



difference of solutes, in the blood and dialysis solution. For example there is high concentration of urea and creatinine in blood but they are totally absent in the dialysis solution. So urea and creatinine diffuse from the blood to the dialysis solution.

Due to diffusion, lactate from the dialysis solution diffuses to the blood and neutralises the acidity in blood.



Ultrafiltration means the removal of excess water. It happens because the dialysis solution contains a sugar called 'Dextrose' which has the ability to attract water from the blood. The excess water flows from the blood to the dialysis solution and is removed while draining.

Generally 2 liters of dialysis fluid is filled in the peritoneum each time. In a day 8-10 liters of fluid is filled and drained from the peritoneum. The normal dwell time is 4-6 hours.

The main components of Peritoneal dialysis are:

1. Catheter
2. Connector
3. Transfer set
4. Safety cap
5. Dialysis Solution Bag

Catheter

Catheter is an elastic tube made up of silicone rubber. It is the lifeline of the patient on Peritoneal dialysis. It provides an access to the peritoneum. It comes in different shapes to suit different patient needs.

Catheter is inserted into the Peritoneum by a minor surgery. It remains attached to the patient for life time. It has small pores on the segment which remains in the peritoneum. It also has a white radio-opaque line so that it is visible on the X-ray.

Proper care of the catheter, tunnel and exit site are very critical in taking long term, infection free, peritoneal dialysis.

Connector

Connector is made up of Titanium/ plastic. It connects to the catheter on one end and to the transfer set at the other.

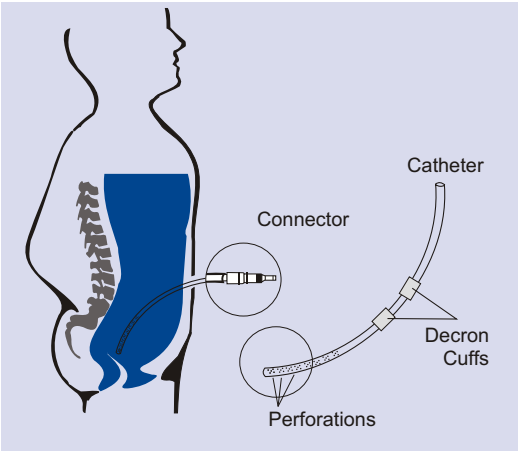
If the connector is of Titanium, it is not required to change it for lifetime. But if it is of plastic, the patient has to change every 2-3 months.

Connector forms the intermediate part between the permanent catheter and non-permanent transfer set.

Transfer Set

Transfer set is an elastic tube with a roller clamp on it to regulate the flow. At one end it is attached to the connector and at the other end with Safety cap or the dialysis solution bag.

The main work of the transfer set is to control the flow of dialysis solution in and out of the peritoneum. It has to be changed every 2-3 months for problem free peritoneal dialysis.



Safety Cap

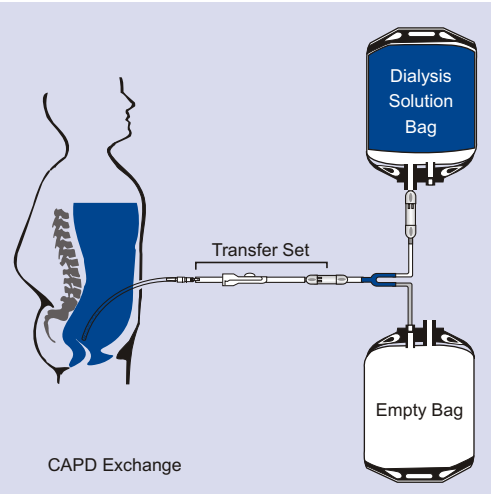
SAFETY CAP is made up of polycarbonate and is used to close the transfer set when it is not in use. It contains Povidone Iodine for disinfection.

Dialysis Solution Bag

This contains the dialysis solution which helps in removing excess water and toxins from blood. It contains glucose and

other ingredients. It is available in appropriate glucose/dextrose concentrations.

These bags contain sterile fluid which is then introduced into the peritoneum through the catheter. The electrolyte



composition of these bags is similar to the electrolyte composition of blood. Various types of bag systems have been developed looking into the needs of patients.

Complications of CAPD

Peritonitis

Peritonitis is the condition of infection of the peritoneal cavity due to bacteria. It is the biggest threat to CAPD treatment. It happens due to bacteria entering the peritoneal cavity either from external environment or from internal organs.

Peritonitis is a major problem in Peritoneal Dialysis. Treatment of peritonitis is a costly affair. So patients are trained in doing asceptic exchange procedure to avoid peritonitis.

Exit Site Infection

Exit site infection means infection at the site from where the catheter comes to the surface of the skin. This happens due to inappropriate care of exit site, slow healing characteristics, etc.

Fibrin in Peritoneal Fluid

Fibrin appears in the peritoneal fluid due to peritonitis or catheter irritation of the peritoneum. White strand (egg white mass) is seen in the drained fluid bag.

Diarrhea

Diarrhea can be caused by peritonitis, viral infection, etc.

Advantages

1. Allows patient to be independent.
2. Can be done at many locations.
3. Does not require any machine.
4. Improves appetite.
5. Less dietary restrictions compared to haemodialysis.
6. Good control of Blood Pressure, Weight, Sodium and Uremic toxins.

Fibrin in Bag During Peritonitis

Disadvantages

1. Must be performed four times daily.
2. Dialysatetobecarriedaround.
3. Riskofperitonitis.
4. Cost is high compared to Haemodialysis.

It is important to remember that the treatment options cannot cure chronic kidney failure. This is because the damage to the kidney is irreversible. These treatments aim to reduce the production of waste products and their removal through other methods.

Keywords

Dialysis, Peritoneal Dialysis, Catheter, CAPD, Transfer set, Peritonitis, Exit site, Fibrin

Please also refer the following information booklets from India Renal Foundation for more information.

1. Choosing Your Treatment
2. Haemodialysis
3. Kidney Transplantation
4. Diabetes and Kidney Failure
5. Hypertension and Kidney Failure
6. Kidney Failure and Anemia
7. Kidney stones and Kidney Failure

Publication of this booklet was done with the help of **JD Printers** and **Gajjar Scanna Pvt. Ltd.,** Ahmedabad.

Registration No. :- U85110GJ2002NPL40355

India Renal Foundation
60-61, A Wing, Nobles, Opp. Nehru Bridge, Ashram Road,
Ahmedabad 380 009, India.
Ph : +91-79-26584251 Fax: +91-79-26587042
Email : irf@indiarenalfoundation.org
visit us at : www.indiarenalfoundation.org