Introduction to Peritoneal Dialysis

Many prospective patients think that their only option for end-stage renal disease (ESRD) is dialysis in a center at least three times a week for an average of four hours a session. This however is not true and there are several other types of options available including peritoneal dialysis (PD), home hemodialysis and transplants. For more information on home hemodialysis options visit our classhere[1].

Peritoneal Dialysis (PD) is a treatment that utilizes your peritoneum, a membrane lining your abdominal cavity, as a filter to remove wastes from your body. Your peritoneum does a similar job as the dialyzer on a dialysis machine during treatment or that your kidneys do every day. Waste products and fluid pass through the membrane into dialysate (dialysis fluid) and the fluid is drained with the waste products. Your peritoneum is what separates your blood from the dialysis fluid and allows the process to occur. Each time fluid is added to the abdomen and extra fluid and wastes are removed is called an exchange. PD has been used in the United States since the 1980?s and improvements continue to be made to ensure it is a safe and effective treatment (1). There are potential benefits and negatives to the treatment and those will be covered in the rest of the class. Upon completing this class, you should be able to make a more informed treatment decision.

1. National Kidney & Urologic Diseases Information Clearinghouse (NKUDIC). (2010), *Treatment Methods for Kidney Failure: Peritoneal Dialysis.* Retrieved from http://kidney.niddk.nih.gov/kudiseases/pubs/childkidneydiseases/overview [2].

Helpful Terminology for this class

Abdomen ? the portion of your body between your chest and pelvis. Commonly referred to as the belly.

Catheter ? rubber tubing that will serve as the access (entry and exit point) for PD.

Continuous ambulatory peritoneal dialysis (CAPD) - is where the blood is always being cleaned. It doesn?t require a machine and fluid is added and removed throughout the day.

Continuous cycling peritoneal dialysis (CCPD) - is a form of PD where a machine helps cycle the exchanges while you are sleeping.

Cycler ? a device or machine that automatically performs PD exchanges.

Dialysate ? the solution that helps your body remove excess waste during dialysis.

Diffusion ? the mechanism that allows your body?s peritoneum to filter materials from higher to lower concentrations

Dwell time - the amount of time dialysis solution remains in the patient's abdominal cavity during a peritoneal dialysis exchange.

Exchange ? the entire process of adding clean dialysate and removing old solution during PD.

Membrane ? a thin layer of tissue that covers a surface.

Nocturnal ? happening at night, in dialysis this is treatment that it done at night while sleeping.

Peritoneum ? the membrane that lines your abdominal cavity that acts as your filter during PD.

Peritonitis ? inflammation of the peritoneum caused by an infection and is a situation that requires medical attention.

Sterile techniques/practices ? washing your hands and other surfaces using prescribed methods to help eliminate potential sources for infections.

I know the terms what is next?

Now that you know the basics of PD, you can learn the details of what makes it work. To prepare for PD therapy, you need to undergo a small surgical procedure to have a catheter inserted into your abdomen. The catheter is a small rubber tube that is placed into the wall of your abdomen and secured using Dacron cuffs. Generally two cuffs are used in adults and they help secure your catheter and prevent some forms of infections.[1] The catheter is your entry and exit point for dialysate and for waste products.

Catheter placement:

The surgery itself can be done in several different ways.[2] It can be done percutaneous, through a laparoscopic surgery or an open surgical route. The laparoscopic and open surgery techniques are preferred because there are additional risks such as bowel injury with the percutaneous method.

Laparoscopic surgery ? is a minimally invasive technique when the operation is performed through a small incision. A laparoscope (type of small camera) is used to view the operation site and place the catheter.

Percutaneous surgery ? involves a guidewire being placed inside of tube. The guidewire is then used to place the catheter into the correct spot and a tunnel is made under the skin to the exit site. This is also a less invasive technique, but could have complications due to the nature of the surgery.

Open surgery ? is where a scalpel is used to but a tiny incision through your skin and muscle of your abdomen. The ?open? area allows the surgeon to place the catheter and the wound is stitched around it. This is the largest incision, but most common surgery.

A similar surgery that takes place in the chest as compared to the abdomen is the use of a presternal catheter. During surgery the longer catheter is placed into the chest using two small incisions. The device has two rubber tubes connected by a metal connector. Since the chest skin is less likely to move and thinner than the abdomen, this could be a good option for children or heavier adults. Patients are also able to bathe with these as long as water levels aren?t up to the catheter.[3]

As with any surgery there can be complications including infections and bleeding. Working with your healthcare team to properly care for your catheter can greatly reduce complications. The most common types of issues involve catheter placement, infections and blockages.

After your catheter has healed, you will begin training. Training differs from office to office, but the basics remain the same. At training you will learn how to:

- Prepare to do an exchange
- Practice safe sterile practice
- Do the exchange itself
- Order supplies you need and how to store
- Follow your fluid and diet restrictions
- Do basic troubleshooting and when to call for additional help
- Use your cycler (if you have one)

Once you have been trained and feel comfortable doing PD, you will be ready to do exchanges yourself. Here [3] is a great animation of the process.

For those of you that prefer text over a video, here are the steps of a CAPD exchange. (Please note this is a generalization and shouldn?t replace the steps given to you by your medical team).[4,5]

1. Wash your hands with proper antibacterial soap.

2. Clean the surface where you will place your supplies and check the expiration dates on

your supplies.

3. Open up your bag of dialysate.

4. Wash your hands again after touching the dialysate bag.

5. Connect your protector to the dialysate?s opening to prevent infection.

6. Hang the fresh dialysate solution bag at your station above your head.

7. Connect your catheter line to the protected end of the dialysate bags.

8. Open the clamp to the drain bag and the old fluid will begin to drain into the empty bag.

9. Allow the fluid that is currently in your abdomen to drain out into the empty bag placed on a low surface or on the floor. This process takes about 20 minutes.

10. Turn the position on the transfer set to allow fresh dialysate to drain into your abdomen, which takes about 5 minutes.

11. After the fill portion has completed, turn the close the clamp.

12. Use the disconnection cap to close off the open end of the catheter.

13. The bag of collected old fluid can be disposed of in the toilet.

14. The bag itself can be collected in a medical waste container.

15. The dialysate that was added will need time to dwell or rest and will remain in your abdomen until your next exchange or overnight if this was your last exchange for the day.

16. The process will be repeated anywhere from 3-5 times a day as prescribed by your physician.

1. Ellsworth, Pamela. MD. FACS. Peritoneal Dialysis Catheter Insertion. Retrieved from http://emedicine.medscape.com/article/1829737-overview#a01 [4].

2. Twardowski ZJ., Prowant BF., Nicholas WK,. Nolph KD,. and Khanna R. Six-year experience with Swan neck presternal peritoneal dialysis catheter. *Peritoneal Dialysis International*. Nov-Dec; 18(6):598-602, 1998. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/9932658 [5].

3. Peritoneal Dialysis ?Is it the right choice for me??. 2002 Retrieved from http://www.med.umich.edu/intmed/nephrology/docs/pd_book_11_30_02.pdf [6].

4. The University of Connecticut Health Center. Procedure for: Peritoneal Dialysis: Acute, Stay-Safe CAPD exchange procedure. Revised May 2010. Retrieved from http://nursing.uchc.edu/nursing_standards/docs/Peritoneal%20Dialysis%20-%20Acute,%20Stay%20Safe%20CAPD%20Exchange%20Procedure.pdf [7].

Links
[1] http://dpcedcenter.org/classroom/home-hemodialysis
[2] http://kidney.niddk.nih.gov/kudiseases/pubs/childkidneydiseases/overview
[3] http://www.kidneypatientguide.org.uk/pdanim.php
[4] http://emedicine.medscape.com/article/1829737-overview#a01
[5] http://www.ncbi.nlm.nih.gov/pubmed/9932658
[6] http://www.med.umich.edu/intmed/nephrology/docs/pd_book_11_30_02.pdf
[7] http://nursing.uchc.edu/nursing_standards/docs/Peritoneal%20Dialysis%20-%20Acute,%20Stay%20Safe%20CAPD%20Exchange%20Procedure.pdf