



Pediatric ESRD Peritoneal Dialysis Fact Sheet

**American
Nephrology
Nurses'
Association**

*Developed by:
ANNA Hemodialysis
Specialty Practice Network*

ANNA's Mission Statement

*ANNA promotes excellence in and
appreciation of nephrology nursing so
we can make a positive difference for
people with kidney disease.*

Additional Information:

American Nephrology Nurses' Association
East Holly Avenue/Box 56
Pitman, NJ 08071-0056
(856) 256-2320
1-888-600-2662

Copyright© 2013
American Nephrology Nurses' Association
Pitman, NJ

This fact sheet may be photocopied for patient
education purposes.

www.annanurse.org

Pediatric ESRD Peritoneal Dialysis Fact Sheet



CHRONIC KIDNEY DISEASE STAGE 5: WHAT IS IT?

Chronic kidney disease (CKD) stage 5 may occur as a result of many systemic disorders or congenital malformations. Children with CKD stage 5 (also known as End Stage Renal Disease – ESRD) may experience fatigue, sluggishness, decreased urine output, difficulty concentrating, inattention in school, anemia, bone disease and hypertension. The treatment involves the use of medication, special diet, and dialysis or transplantation.

PERITONEAL DIALYSIS: WHAT IS IT?

Peritoneal dialysis (PD) is a treatment option for children with CKD stage 5. The patient and/or parents/caregivers usually do the peritoneal dialysis at home following completion of a training program. Peritoneal dialysis requires surgical placement of a catheter into the patient's peritoneal space. Sterile, warmed, electrolyte containing solution, called dialysate, is instilled into the abdomen and allowed to dwell for a prescribed period of time. The lining of the peritoneum is semipermeable and functions as a filter, allowing certain molecules (such as urea) to move across the peritoneal lining into the dialysate. This process of solute removal from high concentration in the blood to low concentration in the dialysate is diffusion. Osmosis occurs when excess water from the patient crosses over the peritoneal membrane in response to the hypertonic glucose concentration in the dialysate. Peritoneal dialysis solutions are manufactured in several different glucose concentrations to help control the amount of fluid removed from the patient. After the prescribed period of time, the used dialysate is drained from the peritoneum and replaced with fresh dialysate.

There are two major types of peritoneal dialysis. Continuous ambulatory peritoneal dialysis (CAPD) requires fresh dialysate to be instilled manually into to peritoneum via the catheter, allowed to dwell for 3 to 5 hours, and then drained from the peritoneum. This process of instilling, dwelling and draining

is referred to as one exchange. CAPD does not require a machine, but because the catheter is opened frequently to allow for several exchanges a day, there is greater risk of infection with CAPD than with peritoneal dialysis modalities that utilize machines. The second type of peritoneal dialysis is continuous cycling peritoneal dialysis (CCPD) and is most commonly used in children. CCPD or automated peritoneal dialysis (APD) requires the patient to be connected to a machine (cycler) which controls the exchange of the dialysate fluid over a period of 8 to 12 hours. This is sometimes easier for the family as the child is having dialysis performed while asleep, and during the day the family and child are able to go about the normal daily activities.

Peritoneal dialysis is a desirable therapy for children as it allows for more regular school attendance and extracurricular activities than hemodialysis does. Because it is performed daily, diet and fluid intake may be less restrictive as well. However, peritoneal dialysis in the home requires significant commitment from the parents/caregivers. They must demonstrate the ability to safely and accurately perform the dialysis and catheter care as well as verbalize understanding of when to call the dialysis center or Nephrologist. Parents/caregivers must be able to provide the peritoneal dialysis on a daily basis and to attend clinic visits with their child monthly. The home environment must allow for storage of large amounts of equipment and have an appropriate area for catheter care and peritoneal dialysis. As the educator, clinician and coordinator of care, the role of the PD nurse is an essential component in the success of the pediatric home PD patient.

CARE OF THE PERITONEAL DIALYSIS CATHETER

Catheter care consists of careful assessment and observation and meticulous sterile dressing changes for 2-4 weeks after placement or until the catheter exit site is healed. After it is healed, the dressing is optional unless the patient wears diapers or has a gastrostomy tube, colostomy, vesicostomy or any other drain or condition that would be a potential source of contamination to the PD catheter site. In all of these cases, continued use of dressings at the PD catheter exit site is recommended. The catheter should also be stabilized securely to the abdomen to avoid trauma or injury to the exit site. Any redness, streaking along the tunnel, drainage, bleeding or leaking of dialysis fluid should be reported to the PD nurse and Nephrologist immediately.

The catheter should remain closed when not in use. Most PD catheters have a piece of tubing attached called an extension set or transfer set. All catheters have a sterile

cap placed on the end to keep the catheter closed in a sterile manner. If the extension set becomes detached, or the sterile cap comes off unintentionally, the PD nurse and the Nephrologist should be notified immediately. If the catheter end is exposed or contaminated by coming in contact with non-sterile items, there is risk of peritonitis, a potentially life threatening infection of the peritoneum. Symptoms of fever, abdominal pain, vomiting, diarrhea, or cloudy dialysate drainage should be reported to the PD nurse and/or the Nephrologist immediately.

VOLUME AND BLOOD PRESSURE CONTROL

Peritoneal dialysis patients may have high or low blood pressure. Fluid status may play a role in blood pressure. Parents/caregivers should monitor both weight and blood pressures at home. Weight greater than estimated dry weight (EDW) after dialysis may mean the patient is fluid overloaded and could contribute to high blood pressure. Edema and headaches may be symptoms of volume related hypertension. Of course, it is possible to have high blood pressure in the absence of hypervolemia. Symptoms of dizziness may be due to low blood pressure. Patients who are hypovolemic may experience low blood pressure. Patients may become hypovolemic if too much fluid is removed during dialysis. In this case their weight after dialysis would be below their estimated dry weight. It can also be the result of vomiting, diarrhea or excessive sweating during summer months. Symptoms as well as blood pressure and weight measurements that are out of desired range for the patient should be reported to the Nephrologist. Because children should gain weight with normal growth, home blood pressure and weight data as well as physical exam should be utilized to evaluate estimated dry weight frequently. Weights greater than EDW after dialysis with normal or low blood pressures and no appreciable edema likely indicates actual weight gain associated with growth.

MEDICATIONS

Adherence to fluid restriction, dietary restriction, and medication regimen are necessary along with dialysis treatment for optimal patient outcomes. Below are some common medications associated with children receiving dialysis.

- *Calcium carbonate, TUMS, Phoslo, Renagel, Renvela* – Phosphorus binders taken with meals and snacks to decrease bone loss.
- *Rocaltrol, Calcitriol* – Vitamin D analog which help manage low calcium levels and treats bone disease
- *Erythropoetin, Epogen, Aranesp, Darbepoetin* – Promotes red blood cell production, injection usually given 2 times per week. Aranesp./darbepoetin is long acting

and usually given monthly.

- *Ferrous Sulfate, Niferex – Iron supplement* – Treats iron deficiency anemia.
- *Multivitamins* – Used as supplement for vitamins lost during dialysis treatments
- *Human Growth Hormone, HGH* – Long term treatment for growth failure, daily injection.
- *Antihypertensives* – Treatment of high blood pressure
- *Colace, Miralax* – Stool softeners to relieve constipation associated with peritoneal dialysis

CHILDREN ON PERITONEAL DIALYSIS: WHAT IS THE GOAL?

The goal for children on peritoneal dialysis is optimal patient outcomes in order to remain as healthy as possible for an eventual kidney transplant. Patient care is very individualized based on the child's health status, physical age and emotional age, parental or guardian support and resources, as well as many other factors. Not all children will qualify for a kidney transplant, therefore their goal would be to maintain optimal health and to successfully transition into the adult dialysis environment.

_____ is a student at your school and is being treated with peritoneal dialysis at _____. His/her primary cause of renal failure was _____.

Other Questions:

For questions and/or concerns please contact us at 1-888-600-2662

For more information about nephrology nursing, dialysis, transplantation, or other renal disorders, check out the American Nephrology Nurses' Association (ANNA) Web site at annanurse.org.