

Hemodialysis Fact Sheet

ANNA

**American
Nephrology
Nurses'
Association**

*Developed by:
ANNA Hemodialysis
Specialty Practice Network*

Hemodialysis Fact Sheet

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:

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CHRONIC KIDNEY DISEASE: WHAT IS IT?

Chronic Kidney Disease (CKD) may become a progressive loss of renal function leading to but not always requiring *replacement therapy*. The etiology of ESRD can be from a variety of diseases, most notably:

- Diabetes mellitus
- Glomerular disease
- Chronic pyelonephritis
- Obstructive disorders
- Hypertension
- Interstitial nephritis
- Cystic/hereditary/congenital diseases
- Drugs/toxins

Regardless of the etiology, many body systems depend upon an environment in which normal kidney function exists. CKD affects virtually every system in the body. These alterations may include:

- Cardiovascular disease
- Bone and mineral imbalances and disorders
- Chronic Inflammatory State
- Anemia
- Hypertension

Manifestations of these alterations include:

- Decreased or no urine output
- Fluid retention/edema – hands, feet, face
- Nausea/vomiting
- Thirst
- Shortness of breath
- Sleep interruption
- Restlessness (“restless legs syndrome”)
- Decreased appetite

Replacement Therapy can take several forms: kidney transplantation, peritoneal dialysis, and the most common form of therapy – hemodialysis. Hemodialysis can be performed acutely, chronically, or as a home therapy.

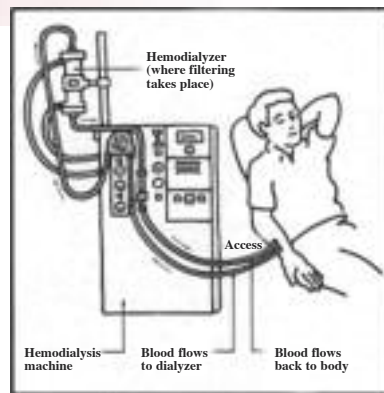
HEMODIALYSIS

Hemodialysis is the most common therapy for patients with CKD because it:

- Removes waste products and excess fluid directly from the vascular system by passing the blood through the artificial kidney, dialyzer (filter).
- Performed 3 to 5 hours three times per week in-center, nocturnally up to 6 hours, or done in short, daily increments if a patient is at home.
- Corrects the pH, electrolytes, and chemical levels of the blood.

The dialysis process:

- Blood is separated from the dialysate (the fluid that passes through the dialyzer and causes the removal of toxins) by a thin semipermeable membrane.



- Uremic toxins and excess levels of chemicals like potassium are removed from the artificial kidney through diffusion.
- Pressure in the dialyzer is used to remove excess fluid. The blood and the dialysate do not come in direct contact with each other.

VASCULAR ACCESS FOR HEMODIALYSIS: *The patient's lifeline*

- Three types of access to circulation can provide adequate blood flow for a thorough dialysis.
- Two types of internal accesses require cannulation with two large bore fistula needles for every dialysis session. One needle will pull the blood into the tubing and dialyzer, while the other is used to return the blood. The needles are removed after the treatment is completed.

Arterio-venous Fistula

- Created by surgically connecting an artery to a vein.
- It is the standardly preferred access.
- Should not be used until it is determined to be ready for use, usually 6 to 12 weeks after its creation.
- Lowest risk for infection.

Arterio-venous Graft:

- Created by attaching a special synthetic tubing to an artery at one end and a vein at the other.
- Ready for use in 2 to 3 weeks (after surgical site healed and swelling has gone down).

Central Vein Catheter :

- Is an external access and may be used for hemodialysis immediately.
- Is placed in a large vein through the neck or upper chest.
- The ports to access the catheter remain outside the body.
- Does not require cannulation.
- Connects directly to the blood tubing of the dialysis machine.

NOTE: DO NOT USE any of these forms of vascular access for anything other than hemodialysis!

NUTRITIONAL MANAGEMENT: TYPICAL RECOMMENDATIONS

- **Protein** 1.0-1.2 g/kg/day 50% high biologic value protein
- **Potassium** 40-70 mEq (1,500-2,500 mg)/day (avoid high potassium foods and salt substitute that is potassium chloride)
- **Sodium** 750-1,000 mg/day (avoid high sodium foods and do not use added salt)
- **Phosphorus** 600-1,200 mg/day (limit dairy products)
- **Calories** >35 kcal/kg/day, less for obese patients (25-30 kcal/kg), and more with stress or malnutrition (40-45 kcal/day)
- **Fluids** limited to 1-1.5 liters plus urine output per day

Diabetes Mellitus: Same meal plan but limit concentrated sweets

TYPICAL MEDICATIONS

- **Multivitamins without minerals or vitamin D** to replace excess loss during hemodialysis (folic acid 1 mg/day)
- **Phosphate binders** to limit GI absorption of phosphorous and prevent renal bone disease or hyperparathyroidism (e.g. Phoslo[®], Renvela[®], Fosrenal[®])
- **Erythropoietin** for anemia (Aranesp[®], Epogen[®], Procrit[®])
- **Iron** for anemia management (oral or IV – e.g. Ferrlecit[®], iron dextran, Venofer[®] or Ferraheme[®])
- **Vitamin D** (1,25 vitamin D₃) to prevent/treat renal bone disease (Hectorol[®], Rocaltrol Zemplar[®])
- **Antihypertensives** for blood pressure management (ACE inhibitors, angiotensin receptor blockers, beta blockers, calcium channel blockers, central alpha-2 agonist, alpha-1 blockers, vasodialators, and especially for CKD, diuretics)

ACTIVITY AND LIMITATIONS: EXERCISE BENEFITS FOR DIALYSIS PATIENTS

- Increased strength and energy
- Improved muscle strength and stronger bones
- Better BP control
- Better sleep
- Better control of body weight
- Lowered level of blood fats (cholesterol & triglycerides)

GUIDELINES FOR EXERCISE

- Advise patients to:
 - a. Check with their health care professional,
 - b. Follow the treatment plan,
 - c. Take any appropriate medications, and
 - d. Follow their diet.
- Emphasize that individual health, fitness level, interest, and available time will vary.

TYPE OF EXERCISE

- Recommend *continuous exercises* that will move large muscle groups, such as walking, swimming, bicycling, skiing, and aerobic dancing.
- Recommend *low level strength exercises*, such as low weights and high repetitions.
- Emphasize that there is to be *no* heavy lifting, and that a slow, relaxed pace of exercise can still yield positive benefits!

TIME TO EXERCISE

- Recommend a minimum of 3 days per week of exercise.
- Advise patients to work toward exercising 30 minutes/session.
- Emphasize that a patient's endurance will be better on nondialysis days.

PARTNERING WITH THE HEALTH CARE TEAM

- Patients can be confident that health care professionals will listen, offer education, continuity of care, and encouragement, as well as information on support groups and rehabilitation.
- Patients who are active participants in their care may have a greater sense of control of their disease.
- Health care professionals (doctors, nurses, social workers, dieticians, and case managers) are invaluable resources to patients.
- Worldwide web is also available and offers numerous informative sites sponsored by nationally recognized kidney organizations, but beware of misinformation.
- Patients can be confident that support is available for lifestyle changes.
- Hemodialysis can be offered as a home therapy when appropriate and if desired by the patient.
- **Remember: Health Care Team + Patient = The Winning Team!**

Advanced Practice Nursing Care (Gomez, 2011) (in addition to the items outlined above):

1. Order and Interpret laboratory results and diagnostic tests (i.e. kinetics, renal function, electrolytes, blood volume monitoring, echocardiograms, x-ray). Order appropriate follow-up and refer to physician as needed.
2. Monitor patient's treatment plan, dialysis prescription, and target weight. Adjust as warranted based on patient's response.
3. Monitor for any signs of infection. Order diagnostic studies or laboratories (i.e. exit site cultures, blood cultures) as warranted and treat as appropriate in collaboration with physician.
4. Monitor patient's response to medications (i.e. ESA, iron, bone disease medications, antihypertensives). Adjust as warranted.
5. Monitor patient's response to diet in collaboration with RD. Adjust as needed in response to patient's treatment plan.
6. Monitor patient's access (see separate Vascular Access Fact sheet).

Reference

- Gomez, N.J. (Ed.). (2011). *Nephrology nursing scope and standards of practice, 7th Edition*. Pitman, NJ: American Nephrology Nurses' Association

Other Questions:

For questions and/or concerns please contact us at 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 www.annanurse.org.

