Chronic Kidney Disease Fact Sheet

American Nephrology Nurses' Association

Revised by:
ANNA Chronic Kidney Disease Special Interest Group

ANNA's Mission Statement

ANNA will advance nephrology nursing practice and positively influence outcomes for patients with kidney disease through advocacy, scholarship, and excellence.

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Chronic Kidney Disease: What Is It?

Chronic kidney disease (CKD) is a slow progressive loss of kidney function as a result of structural or functional abnormalities of the kidney for ≥ 3 months or glomerular filtration rate (GFR) <60ml/min/1.73^2 for ≥ 3 months irrespective of presence or absence of kidney damage. The National Kidney Foundation estimates that around 20 million Americans have CKD and another 20 million are at risk. Individuals diagnosed with CKD should be assigned a stage of disease based on level of kidney function, irrespective of diagnosis. The stages of kidney disease are determined by GFR. The majority of patients with CKD are actually in stages 1 and 2, and not all patients progress to stage 5 and dialysis.

Stages of Chronic Kidney Disease

Stage	Description	GFR (ml/min/1.73m^2)
1	Kidney damage with normal or ↑ GFR	≥ 90
2	Kidney damage with mild ↓ GFR	60-89
3	Moderate ↓ GFR	30-59
4	Severe ↓ GFR	15-29
5	Kidney Failure	<15 (or dialysis)

(NKF Clinical Practice Guidelines for Chronic Kidney Disease, 2002)

Risk Factors for Chronic Kidney Disease

- Diabetes
- Hypertension
- Urinary tract infections
- Systemic infections
- Urinary stones
- Lower urinary tract obstruction
- Neoplasia
- Family history of CKD
- Recovery from acute kidney failure
- Reduction in kidney mass
- Exposure to certain drugs
- Older age
- Autoimmune disease
- Ethnicity: African American, American Indian, Hispanic, Asian, or Pacific Islander

Etiology from a Variety of Diseases, Including but Not Limited To:

- Diabetes mellitus
- Hypertension
- Glomerular disease
- Vascular disease
- Obstructive disease
- Heredity disease
- Chronic pyelonephritis

CKD SIGNS AND SYMPTOMS ACCORDING TO STAGES

Signs, symptoms, and lab abnormalities vary based on the level of kidney dysfunction.

Stage	Signs and Symptoms
1	Normal or ↑ GFR Structural or functional abnormality of kidney based on markers of kidney disease (e.g. proteinuria, abnormalities of imaging tests, etc.) May have normal BP No serum lab abnormalities; there may be abnormalities in the composition of urine or imaging tests No symptoms
2	GFR 60-89 ml/min/1.73m^2 Generally asymptomatic Hypertension usually develops at this stage Serum lab abnormalities are not present
3	GFR 30-59 ml/min/1.73m^2 Serum lab abnormalities may be present indicating anemia, bone disease, and disorders of calcium, phosphorus, and parathyroid hormone (PTH) levels Usually asymptomatic Hypertension usually present
4	GFR 15-29 ml/min/1.73m^2 Serum lab abnormalities as above including metabolic acidosis Mild symptoms such as fatigue, anorexia, edema, impaired memory Hypertension Dyslipidemia
5	GFR <15 ml/min/1.73m^2 Serum lab abnormalities as above More symptomatic due to uremia: malaise, weight loss/gain, neuropathy, trouble sleeping, anorexia, nausea, vomiting, taste changes, edema, muscle cramping, cognitive decline Hypertension Malnutrition due to anorexia or decreased protein intake and/or increasing proteinuria Dyslipidemia

TESTS

Urine: Proteinuria can occur when there is damage to the kidney. The excretion of albumin is a sensitive marker for CKD due to diabetes, glomerular disease or hypertension. Microalbuminuria is not detected with tests for total protein, so random spot urine samples can be used to detect and monitor protein excretion.

Serum creatinine: Creatinine is a waste product that comes from muscle activity. Serum creatinine alone is not an accurate indicator for kidney dysfunction.

GFR: Identifies CKD stages and is used as a monitor of kidney function. GFR is a more sensitive measure to estimate kidney dysfunction. It can be estimated by obtaining a 24-hour creatinine clearance or by use of one of the formulas that have been developed to estimate the GFR using different variables.

Ultrasound: Shows kidneys and urinary tract; can identify stones, tumors, or structural problems.

Kidney biopsy: A small piece of kidney tissue is removed and looked at under a microscope to determine the exact cause of kidney dysfunction.

TREATMENT

1. Initial treatment is aimed at treating the primary disease. For example, if diabetes, then strict glycemic control is very important. Hypertension management to optimally control blood pressure; recommended goal is 130/80.
2. Cessation of medications that are damaging to the kidneys, such as NSAIDs.
3. Reduction of proteinuria with appropriate medications, such as ace inhibitors or angiotension receptor blockers.
4. Monitor for signs and symptoms of anemia, metabolic bone disease, and disorders of calcium, phosphorus, and parathyroid gland function such as secondary hyperparathyroidism. Abnormalities should be treated with appropriate medications and/or dietary measures.
5. Early referral to a nephrologist at stage 3 or 4 is important so that treatments focusing on preventing the progression of CKD are initiated. In addition, the person should receive guidance in developing self-management strategies that promote health as well as treatment of complications and co-morbid conditions. It is important in stage 4 to begin timely discussions of kidney replacement therapy, such as hemodialysis, peritoneal dialysis, or transplantation, to enable the person to make an informed decision and initiate planning and implementation for appropriate access if indicated. Ongoing education about vein preservation of both peripheral and central vessels should be stressed, especially if hemodialysis is the choice.
6. Individuals diagnosed with CKD have an increased risk of death from cardiovascular disease (CVD). It is important to assess the risk factors for CVD and implement appropriate interventions.
7. It is important to monitor patients' nutritional health. Nutritional needs for patients with CKD often change based on the decline of kidney function. A number of tests can be done to monitor their nutritional health. It is important that they are getting the right amount of protein and calories to maintain a healthy body weight. Their health care provider may refer them to a registered renal dietician who will help them plan their meals, select the right foods and amounts, and assist in making changes in their diet based on their nutritional health and kidney function.
8. Lifestyle changes, such as weight reduction, exercise programs, avoiding salt intake, and cessation of smoking, should be included in the plan of care.

COMMON MEDICATIONS USED IN CKD TREATMENT

Erythropoietic stimulating agents: Promote red blood cell production by the bone marrow; can be given as a subcutaneous or intravenous injection.

Iron preparations: Treat iron deficiency anemia. May be given orally but often there is a poor response due to decreased absorption; then it can be given intravenously.

Phosphate binders: Decrease the level of phosphorus in the body by binding with phosphorous from food before it is absorbed into the blood stream. They are to be taken with food and depending on the product, can be taken at the beginning or the end of the meal.

Vitamin D preparations: Treat and prevent progression of metabolic bone disease and secondary hyperparathyroidism.

Antihypertensives: Treat hypertension, but can be used to treat proteinuria with or without hypertension and cardiomyopathy without hypertension.

Vitamin preparations: Patients with CKD should not take over-the-counter (OTC) vitamins; there are several specific vitamins for individuals with CKD.

It is important to remember that medication doses may need to be adjusted as kidney disease progresses. All medications, including OTC medications and herbal supplements, should be reported to the patient's provider.

ADDITIONAL INFORMATION

National Kidney Foundation. (2002). *NKF/KDOQI guidelines.* New York: National Kidney Foundation. Retrieved from www.kidney.org

American Nephrology Nurses' Association (ANNA) – www.annanurse.org

American Dietetic Association. (2002). *Guidelines for nutritional care of renal patients.* American Dietetic Association

Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure

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 go to ANNA Web site www.annanurse.org

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05/09