

# HEALTH IN OUR HANDS!

The Arkansas State University Wellness Program Newsletter  
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## Kidney Health

This month's issue of *Health in our Hands* recognizes national kidney month.

### Overview

The kidneys are a bean-shaped organ located in the middle of the back. The kidneys filter blood and remove extra water and waste from the body by producing urine. The kidneys filter approximately 200 quarts of blood. After the kidneys have removed the waste and water, it travels down the ureter to the bladder where it is stored until a person goes to the bathroom. The filtering occurs in the nephrons of the kidney. Every kidney has about a million nephrons. The kidneys measure chemicals like sodium, phosphorus, and potassium and release a certain amount back into the blood to return to the body. This is how the kidneys regulate the body's level of these substances. Beside removing waste and excess fluid, the kidneys also release three hormones: erythropoietin, renin, and calcitriol. Erythropoietin stimulates the bone marrow to make red blood cells. Renin regulates blood pressure and calcitriol helps maintain calcium for bones and for normal chemical balance in

the body. When the kidneys are damaged and don't filter blood like they should, waste builds up in the body. The amount of kidney damage is indicated by renal function which is the activity level of the kidneys. Renal function is described by the glomerular filtration rate, the volume of fluid filtered through the kidney's capillaries. Serious health conditions begin when you have less than 25 percent of renal function. If renal function is below 10 to 15 percent the prognosis is poor without some form of continuous renal replacement therapy. The most common type of kidney damage is chronic kidney disease. Chronic kidney disease (CKD) occurs slowly over many years. When someone has a sudden change in kidney function it is called acute kidney injury. More than 20 million Americans have kidney disease.

### Chronic Kidney Disease

Chronic kidney disease is most often caused by diabetes or high blood pressure. Early detection can help prevent the progression of kidney disease to kidney failure. However, kidney disease often goes undiagnosed because the

signs and symptoms are so subtle. Symptoms include:

- Changes in urination – changes include frequency, amount, foam or blood in the urine, and difficulty urinating.
- Swelling – swelling in the legs, ankles, feet, face or hands
- Skin rash/itching
- Leg, back or side pain
- Bad breath – the buildup of waste can cause a metallic taste in the mouth, affect how food tastes and results in weight loss
- Nausea and vomiting
- Feeling cold – the depletion of erythropoietin causes a depletion of red blood cells causing anemia
- Shortness of breath – kidney disease can cause fluid buildup around the lungs.
- Dizziness and trouble concentrating – anemia causes a lack of oxygen to the brain
- Fatigue – includes tired muscles, weakness and overall fatigue

There are five stages of CKD. In stage one the glomerular filtration rate (GFR) is normal or slightly higher being greater than 90 ml/min. There are no symptoms in stage one. In stage

two, the GFR is at 60-89 ml/min but there are still no noticeable symptoms. In stage three the GFR is 30-59 ml/min and the patient could show signs of kidney disease including high blood pressure, anemia and early bone disease. The GFR in stage four is 15-30 ml/min and the person will need dialysis or a kidney transplant before long. Stage five the GFR is 15 ml/min or less and the kidneys have lost nearly all their ability to function. Dialysis or a kidney transplant is needed for survival.

### **Acute Kidney Injury**

There are three different kinds of acute kidney injuries including prerenal failure, intrinsic renal failure and postrenal failure. Prerenal failure is caused by hypovolemia (hemorrhage or GI fluid loss), volume overload with reduced renal perfusion or peripheral vasodilation. Intrinsic renal failure is caused by acute tubular necrosis, acute interstitial nephritis, and atheroembolic acute kidney injury. Postrenal failure is caused by ureteric obstruction or bladder outflow obstruction.

### **Risk Factors**

The most common risk factors include hypertension, diabetes and family history. Another important risk factor is certain other diseases. Lupus, sickle cell anemia, cancer, AIDS, hepatitis C and congestive heart failure put a person at an increased risk of developing kidney disease. Early kidney disease has no signs or symptoms so it is important to assess your risk. After assessing your risk, people with a high risk should be checked regularly.

Early detection can prevent kidney failure. The National Kidney Foundation's Kidney Early Evaluation Program (KEEP) offers free screenings for those at risk for kidney disease.

### **Diagnosis/Treatment**

Blood tests will assess the glomerular filtration rate. Urine tests check the albumin levels. The simple treatment methods include diet changes and medications. Later stages may require transplant or kidney dialysis. Dialysis removes waste and extra fluid using a filter. There are two types of dialysis; peritoneal dialysis and hemodialysis. In peritoneal dialysis, the filter is in the lining of the abdomen. Hemodialysis is when the filter is in a plastic tube filled with millions of hollow fibers, called a dialyzer. A kidney transplant can happen quicker than most transplants because of live donation. A person only needs one kidney for a normal, healthy life.

### **Healthy Tips**

There are several tips to keeping your kidneys healthy from changing your diet to managing your other diagnoses.

- Control blood pressure/glucose levels – controlling these levels is the easiest way to prevent kidney disease.
- Medicine – Be sure to take all medication the way it is prescribed. Blood pressure medicine can help to protect the kidneys.
- Nutrition – Ingest less than 1500 mg of sodium per day. Try to choose foods that are heart healthy such as fruit,

vegetables, whole grains, and low-fat dairy foods.

- Be physically active.
- Maintain a healthy weight – Being overweight can put strain on the kidneys because of the needed increase in filtration rates.
- Stop smoking
- Remove blockage – Have kidney stones removed immediately. Scarring from infections or a malformed urinary tract system can cause urine to back up into the kidneys
- Painkillers/Antibiotics – Don't overuse these drugs because they can cause kidney inflammation leading to kidney failure.
- Inflammation – certain illnesses such as strep throat can cause inflammation in the kidneys decreasing filtration rates.

### **References**

- [www.davita.com](http://www.davita.com)
- [www.kidney.org](http://www.kidney.org)
- <http://nkdep.nih.gov>
- [www.nationalkidneycenter.org](http://www.nationalkidneycenter.org)
- [www.clinicalkey.com](http://www.clinicalkey.com)

### **Other News**

\*\*If you have any suggestions for newsletter topics, please contact Dean Susan Hanrahan at [hanrahan@astate.edu](mailto:hanrahan@astate.edu).

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The Arkansas State University Employee Wellness Newsletter is published monthly during the academic year by the College of Nursing and Health Professions. Health questions can be addressed to Dean Susan Hanrahan, Ph.D., ext. 3112 or [hanrahan@astate.edu](mailto:hanrahan@astate.edu). Produced by Michelle Williams, graduate student in the College of Nursing and Health Professions, Physical Therapy Program.