

# Diabetes Newsletter



1600 North Second Street

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## Why the Kidneys Are Key

Healthy filters keep the body's chemistry in balance

By Erika Gebel, PhD

This article was featured in the July 2010 Diabetes Forecast magazine.

The kidneys are the most discriminating of filters. They constantly sift through the blood, making sure the body keeps the good stuff and sends waste on its way. This sophisticated selectivity requires a network of delicate filtration units, which unfortunately are prone to damage by diabetes. Such kidney disease is called diabetic nephropathy and occurs in 20 to 40 percent of people with diabetes. Until its late stages, nephropathy can be detected only by special blood and urine tests. By the time symptoms develop, the condition can be debilitating. Yet, there are ways to protect the kidneys—and keep these filters healthy for a lifetime.

### Busy Bundles

Kidneys come in pairs, with one nestled on either side of the crook in the lower back. To visualize these organs, look no further than your pantry: The kidney bean is shaped very much like its namesake, although the kidneys themselves are considerably larger, each roughly the size of a fist.

Every day, 45 gallons of blood are processed through the kidneys. Blood enters each kidney through a single artery, which then branches immediately off into smaller and smaller blood vessels that spiral around the organ's perimeter. Along the way, the blood vessels form little bundles that fit into the kidney's drainage pipes, or tubules. Where the tubules and vessel bundles meet, a complex exchange takes place that cleanses the blood of chemicals that would be toxic if allowed to accumulate. These toxins, along with some water, enter the tubules and become urine, which travels to the bladder for excretion.

While expelling toxins, the kidneys also make sure the body doesn't rid itself of anything useful. They retain certain amounts of vital chemicals, like sodium and potassium, to tweak blood salt and pH levels, which need to be kept within a very tight range for the body to function properly. The kidney filtration system also reabsorbs enough water to keep the body adequately hydrated. The amount of water and salt in the body affects blood volume, which allows the kidneys to regulate blood pressure. Kidneys also make hormones that cause blood vessels to constrict, which raises blood pressure.

### A Sick Sieve

Kidney failure, or end-stage renal disease, is the complete or almost complete inability of the

kidneys to detoxify the blood and can be fatal. The first sign of kidney damage is typically the presence of a protein called albumin in the urine; in a healthy person, the albumin is retained in the blood. This is why urine albumin tests are used to help diagnose nephropathy. When urine protein levels are low, and kidney disease is in its early stages, there are generally no outward symptoms, which often don't appear until the last stage of the disease. Symptoms may include fatigue, foamy urine, hiccups, headache, itchiness, nausea, vomiting, loss of appetite, and fluid retention.

Diabetes isn't the only reason why kidneys fail, but it is the No. 1 cause. Exactly how the high blood glucose of diabetes causes nephropathy isn't entirely understood. Researchers suspect that tiny blood vessels, like the ones that are critical to kidney function, are particularly vulnerable to high blood glucose levels. Other common complications of diabetes also involve body parts, such as the eyes and nerves, that rely on similarly delicate vessels. Hence, the diabetes-caused afflictions retinopathy, neuropathy, and nephropathy are called "microvascular" complications.

The American Diabetes Association (ADA) recommends that people with type 2 diabetes have their doctors check for albumin in their urine at diagnosis and then annually. With type 1, the annual albumin tests should begin five years after diagnosis (nephropathy rarely occurs in the first few years after developing type 1). Another test is recommended at least annually for all adults with diabetes regardless of urine albumin levels: It is a blood test that checks for serum creatinine, a protein normally cleared by the kidneys, and can be used to assess kidney function and the severity of kidney disease.

## **To Your Health**

Preventing and treating nephropathy both begin with blood glucose control. Research shows that bringing down blood glucose levels with diet, exercise, and medicine can reduce the risk of developing kidney disease and slow its progression. Lowering A1C (average blood glucose over the past two to three months) by 1 percentage point can cut the risk of diabetic nephropathy by 40 percent.

Another way to fight nephropathy is by keeping blood pressure in check. Kidney disease can cause an increase in blood pressure, while high blood pressure can also lead to and accelerate kidney disease.

For people with diabetes, ADA recommends that blood pressure be kept under 130/80 mm Hg.

Treatment of the early stages of nephropathy usually includes specific kidney-protecting blood pressure medication, either ACE inhibitors or ARBs. Doctors may also recommend reducing the amount of protein in the diet, which has been found to help ailing kidneys.

If the progression of kidney disease can't be arrested and the kidneys fail, dialysis may be needed.

There are two main types of dialysis. In hemodialysis, blood is removed from the body, cleaned in a machine, and then returned to the body. The process typically takes around four hours per session, three times a week. The other type is called peritoneal dialysis and can be done at home. In this treatment, a catheter is surgically inserted into the abdomen. The patient fills this cavity with a special fluid that draws out toxins from the blood as it travels through the abdomen. Afterward, the soiled fluid is drained and discarded.

A kidney transplant is another option; it is one of the most common transplant operations done in the United States. A donor kidney must come from someone with the same blood type and a similar immune system. For people with type 1 diabetes, transplantation of a kidney and a pancreas at the same time is sometimes possible. For a person who is healthy enough for and has access to a donor kidney (the average wait time for a kidney is a little over three years), transplantation offers a better and longer life than dialysis, research shows.

Diabetes can turn the body's twin filters from picky to passive. But good blood glucose and blood pressure control, timely screening, and aggressive treatment can help preserve these vital organs' discriminating tastes.

## Clinton Support Group

### TOPIC

Gastroparesis

### DATE

Thursday,  
August 12, 2010

### TIME

10:30—11:30 a.m.

### PLACE

GVMH Medical Plaza Classroom

### Presented By:

**Jamie Ketterman, RN, BSN, CDE**

## Windsor Support Group

### TOPIC

Gastroparesis

### DATE

Tuesday,  
August 10, 2010

### TIME

11:30—12:30 a.m.

### PLACE

GVMH Medical Windsor Rehab and Wellness  
Center

### Presented By:

**Jamie Ketterman, RN, BSN, CDE**

### Breakfast-In-A-Glass Smoothie

#### Marlene Koch

April 2010

#### Note:

*Courtesy of "Eat What You Love: More Than 300 Recipes Low in Sugar, Fat, and calories" by Marlene Koch (Running Press, 2010)*

Here's news for all breakfast skippers; studies show that those who eat breakfast tend to be stronger, smarter, thinner, and happier than those who don't. A great grab-n-go smoothie makes it easy. Kid-friendly and packed with nutrients, a single serving of this delicious orange tinged smoothie delivers as much muscle-building protein as two eggs, and over 20 percent of the daily requirement for vitamins A, C, and calcium. Feel free to serve it with a piece of whole grain toast or whip one up as a nutritious afternoon snack.

#### Ingredients & Methods

Makes 1 serving

1/3 cup light orange juice

1/3 cup nonfat plain yogurt

4 packets no-calorie sugar substitute

1/3 cup liquid egg substitute

Dash of vanilla

1/2 cup crushed ice

#### Method:

Place all the ingredients, except the ice, in a blender. Blend to mix.

Add crushed ice and blend on high until the ice is completely incorporated and drink is frothy.

#### Nutrition at a Glance

Calories	130
Carbohydrate	16 g (Sugars 10 g)
Total fat	2 g (Sat. fat 5 g)
Protein	14 g
Fiber	0 g
Cholesterol	0 g
Sodium	170 mg

Food Exchanges: 1 lean meat; 1/2 non-fat milk, 1/2 fruit

Carbohydrate choices 1

Weight Watchers Point Comparison 3