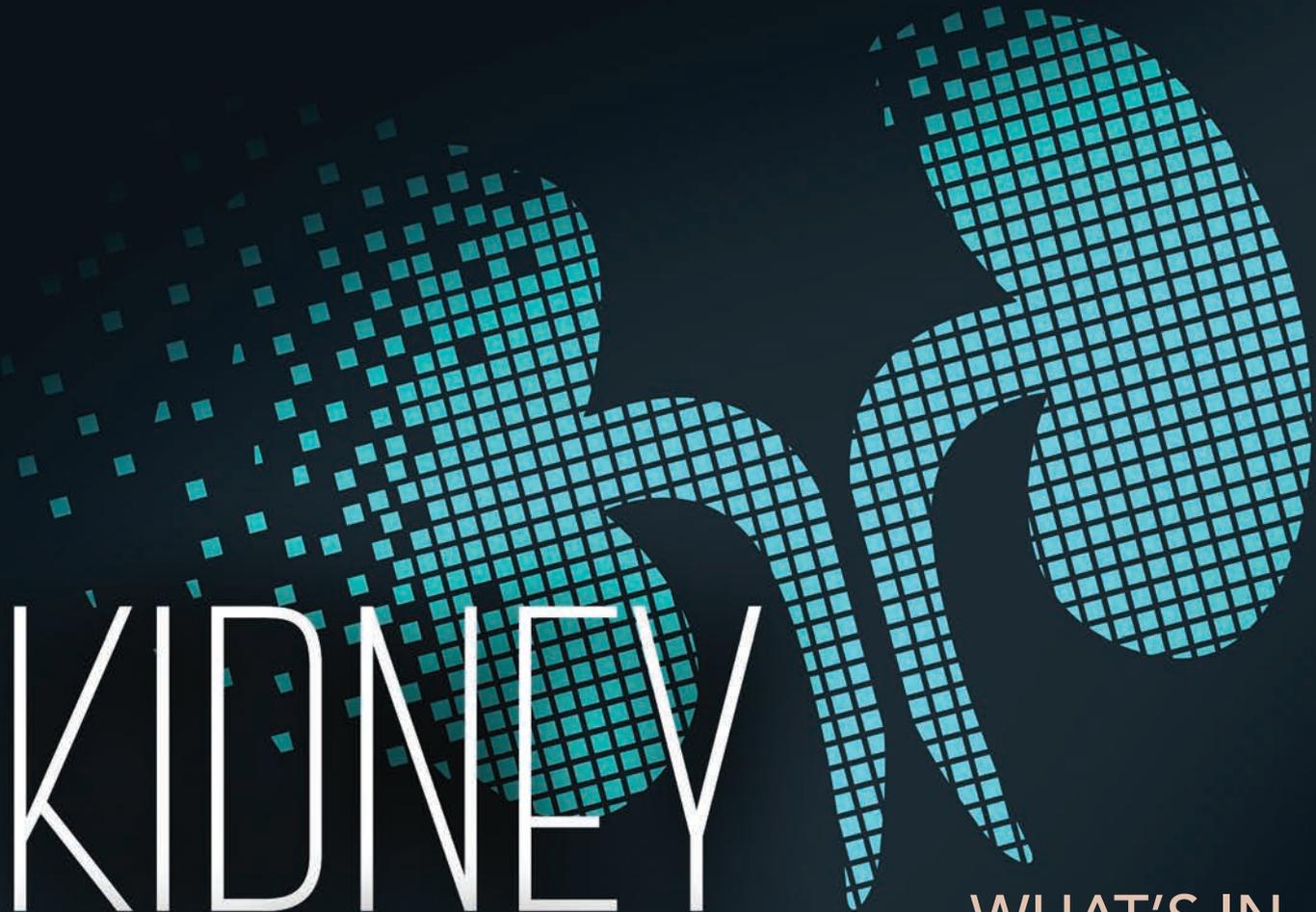


Nutrition Action

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HEALTH LETTER®
CENTER FOR SCIENCE IN THE PUBLIC INTEREST



KIDNEY CHECK

How to keep yours going strong

WHAT'S IN
YOUR WATER?

Is butter
better?

Snacks that *sound*
good. Snacks that
are good.

KIDNEY CHECK

How to keep yours going strong

BY BONNIE LIEBMAN

"I didn't know that I had end-stage renal disease until I was admitted to the hospital in 2009," says David White, who was then in his mid-40s. "A few days later, I stopped producing urine."

Doctors told White that he had crashed. "It was scary," he says. "I went from 'Something may be wrong' to 'Oh my god am I going to die?' to 'I have to spend the rest of my life on dialysis.'"

And with four hours of dialysis three times a week, he never felt great.

"People call it the dialysis hangover," says White, from Temple Hills, Maryland.

"You're so tired that you want to sleep all day after dialysis and most of the following day. And then you gear up for the next treatment."

And White struggled with his one-quart-a-day limit on fluids. "When you drink too much, moving isn't comfortable, laying down isn't comfortable," he says. "It's hard to breathe."

For Gail Rae-Garwood, the news about her kidneys came when she switched to a new doctor closer to her home in Glendale, Arizona.

"She decided that as a new patient, I

One out of ten adults have chronic kidney disease. Most don't know it because early on, kidney disease has no symptoms. And because the risk rises as you age, roughly one out of two people aged 30 to 64 are likely to get the disease during their lives. Here's how to find out if your kidneys are healthy...and how to keep them that way.

should have all new tests," says Rae-Garwood, now 69. "When the results came in, she got me an appointment with a nephrologist the next day. When you get an appointment with a specialist the next day, you know something is not right."

Rae-Garwood had chronic kidney disease. "My GFR was down to 39, and apparently had been low for quite a while," she says. (Your GFR, or glomerular filtration rate, is the rate at which your kidneys filter your blood.)

"What is chronic kidney disease and how did I get it? I demanded," recalls Rae-Garwood.

Every 30 minutes, your kidneys filter all the blood in your body. Without at least one, you need dialysis or a transplant. Yet most people have no idea how well their kidneys are working.

"It's very common for people to have no idea that they have early chronic kidney disease," says Alex Chang, a nephrologist at Geisinger Health System in Danville, Pennsylvania.

A routine blood test sent to a major lab—like Quest or LabCorp—typically includes your GFR. If it doesn't, your [doctor can calculate it](#).

"A GFR is pretty routine for anyone who has blood work done," says Chang. "But if you



Gail Rae-Garwood found out she had kidney disease when she switched doctors.

have very mild kidney disease, and especially if you're older, a doctor might not mention it since kidney function tends to decline as you age."

Doctors also look for kidney disease by testing your urine for a protein called albumin (see p. 4). "That's usually only done if you have high blood pressure or diabetes or some risk factor for kidney disease other than age," says Chang.

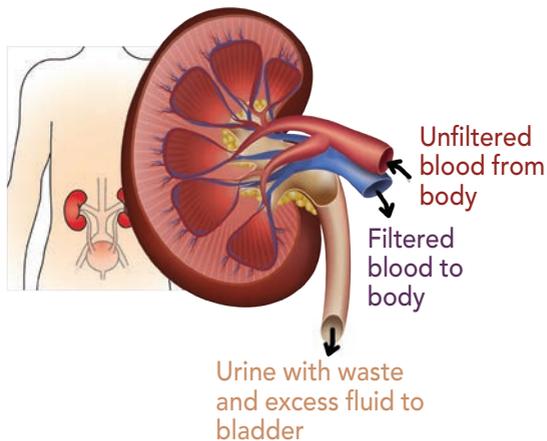
Rae-Garwood's previous doctor missed that memo. "I had been on medication for high blood pressure for decades," she explains. "I wonder how much more of my kidney function I could have preserved if I'd known about it earlier."

What Raises Risk

Millions of people have the biggest risk factors for kidney disease:

■ **Age.** "There's some debate about whether a small decline in kidney function is part of normal aging or whether

How Kidneys Work



Dish Up Some DASH

A DASH-like diet can help lower your risk of stroke, heart attack, heart failure, and maybe kidney disease. Here's a 2,100-calorie version.

	Daily Servings
 VEGETABLES & FRUIT 1 serving: ½ cup (or 1 cup greens) or 1 piece fruit	11
 GRAINS 1 serving: ½ cup pasta or rice or cereal or 1 slice bread	4
 LOW-FAT DAIRY 1 serving: 1 cup milk or yogurt or 1½ oz. cheese	2
 LEGUMES & NUTS 1 serving: ½ cup beans or ¼ cup nuts or 4 oz. tofu	2
 POULTRY, FISH, LEAN MEAT 1 serving: ¼ lb. cooked	1
 OILS & FATS 1 serving: 1 Tbs.	2
 DESSERTS & SWEETS 1 serving: 1 tsp. sugar or 1 small cookie	2
 WILD CARD Poultry, Fish, Meat or Oils & Fats or Grains or Desserts & Sweets	1

it's a pathologic loss of kidney function," says Geoffrey Block, associate clinical professor in medicine at the University of Colorado Health Sciences Center.

A normal GFR is 90 or above, but some doctors consider 60 or above normal for older people.

"Age is a very good predictor of risk," notes Block. "There's no stronger risk factor for kidney disease than age."

■ **Diabetes.** "Diabetes is the second biggest risk factor," says Block, not only for getting kidney disease but for its consequences—heart attacks, strokes, heart failure, and further kidney damage.

One in three adults with diabetes have chronic kidney disease.¹ And people with diabetes make up nearly 44 percent of new cases of kidney failure. That's when you need dialysis or a kidney transplant to survive.

uria go away," he says.

For example, medications like ACE inhibitors, which lower blood pressure, may keep your kidneys from leaking albumin into your urine.

And whether your kidneys are in tip-top shape or starting to decline, a healthy lifestyle can protect them.

"If you're smoking, quitting can help," says Chang. Smoking slows blood flow to the kidneys.

"If you're obese," he adds, "losing weight could reduce the albumin in your urine and improve your blood pressure

And it's not just diabetes. "Some studies show that prediabetes can increase the risk of kidney damage later," says Chang.

■ **Hypertension.** One in five adults with high blood pressure also have chronic kidney disease.

■ **Race.** "We know that African-Americans are more at risk for developing kidney disease and more at risk to have their kidney disease progress," says Block.

What Lowers Risk

What's the best strategy to keep your kidneys in good working order?

"If tests show that you have mild kidney disease, I'd say you're lucky you caught it early," says Chang.

The good news: "Controlling your blood pressure and blood sugar might make the albumin-

and diabetes." And it's not just *how much* but *what* you eat that matters.

In a study that tracked roughly 3,700 people with chronic kidney disease for seven years, those who consumed the most salt had a higher risk of stroke and heart failure than those who consumed the least.² And it wasn't just because sodium raises blood pressure.

"A high-sodium intake may have an independent effect on the kidney," says Chang. "Focusing on salt is a good target because it's so prevalent and most people eat too much."

Eating healthy foods may also protect your kidneys. Chang and his colleagues tracked roughly 2,300 adults aged 28 to 40 in the CARDIA study for 15 years.³ "We wanted to find the early risk factors for kidney disease," he explains.

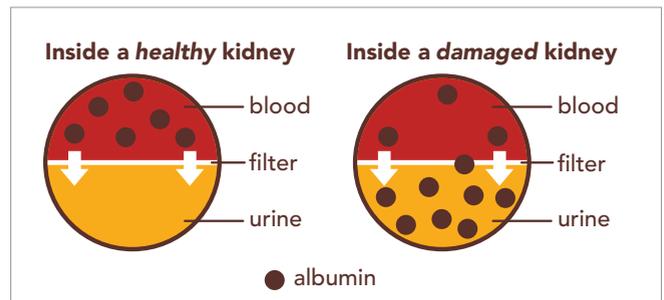
"We found that being obese and eating an unhealthy diet were strongly associated with albumin in the urine."

An "unhealthy" diet was one with few features of the DASH (Dietary Approaches to Stop Hypertension) diet. (See "Dish Up Some DASH.")

Similarly, when researchers tracked roughly 3,000 women in the Nurses' Health Study for 11 years, those who ate a DASH-like diet were 45 percent less likely to have a rapid drop in GFR.⁴ In both studies, a DASH diet meant:

- **MORE** fruits, vegetables, nuts and legumes, low-fat dairy products, and whole grains, and
- **LESS** salt, sugar-sweetened drinks, and red and processed meats.

"Following a DASH-type diet has the



Healthy kidneys allow little or no albumin to leak into urine.

potential to improve kidney function,” notes Chang. “And it affects other cardiovascular risk factors, too.”

And that’s critical, because only a small fraction of people with kidney disease end up with kidney failure.

“You are four to five times more likely to die of a cardiovascular event like a heart attack or stroke than to reach dialysis,” says Block.

Phosphorus

Obesity, hypertension, diabetes, smoking. All are known threats to kidneys. Now a number of scientists are worried that the list may also include the phosphorus in our food.

Phosphorus occurs naturally in meat, poultry, grains, dairy, and many other foods. But in recent decades, companies

now that people with chronic kidney disease tend to retain phosphorus, and that leads to cardiovascular disease and worse kidney function,” says Jaime Uribarri, professor of nephrology at Mount Sinai Hospital in New York.

What about people with normal kidneys?

“The picture is not perfectly clear, but several pieces of evidence suggest harm,” says Block.

For example, among roughly 2,270 participants without kidney disease in the Framingham Heart Study, people with blood phosphorus levels of 4 mg/dL or higher—which is the higher end of the normal range—were twice as likely to be diagnosed with chronic kidney disease over the next 25 years.⁶

And several studies report a higher risk

15 years,” says Chang. One out of three participants ate more than 1,400 mg a day—that’s double the Recommended Dietary Allowance.

How might phosphorus harm the heart or kidneys?

“This field exploded when we learned that as you raise blood phosphorus to levels seen in kidney disease, you push the balance of hormones toward calcifying your arteries,” says Block.

“Phosphate turns certain cells in your blood vessels into cells that act as if they are mineralizing bone. And as you calcify your arterial system, you increase the demand on the heart.”

That’s because it takes more work to pump blood through calcified arteries.

What’s more, when you consume phosphorus, blood levels temporarily

How to Protect Your Kidneys



Keep blood sugar under control.



Reduce salt intake.



Keep a lid on blood pressure with diet, exercise, and meds.



Stop smoking.



Exercise daily, and lose excess weight.



Eat a DASH-like diet rich in fruits and vegetables.

have started adding phosphorus-containing compounds—like sodium phosphate and phosphoric acid—to thousands of foods. In a 2010 survey of roughly 2,400 branded grocery items, 44 percent had added phosphorus.⁵

“Phosphates have so many different functions—homogenizing, smoothing, water retention, a leavening agent, and more,” says Mona Calvo, a nutrition scientist formerly at the Food and Drug Administration.

Too much phosphorus is clearly a problem for people with kidney disease.

“We’ve known for a couple of decades

of arterial stiffness, heart failure, or death from cardiovascular disease in people with higher blood phosphorus levels (and, in most cases, no kidney disease).⁷⁻⁹

“Those findings are by no means universal,” says Block. “But they’re seen in a large body of evidence.”

Several years ago, Alex Chang and colleagues at Johns Hopkins University also looked at how much phosphorus people in the National Health and Nutrition Examination Survey ate.¹⁰

“Above 1,400 milligrams of phosphorus a day or so, we started seeing an increased risk of dying over the next

rise, triggering the release of hormones that tell the kidney to excrete more phosphorus. One is fibroblast growth factor 23 (FGF23).

“FGF23 is toxic to heart cells,” says Block. In animal experiments, it leads to left ventricular hypertrophy, a weakening of the chamber of the heart that pumps blood throughout most of the body.

Excess phosphorus may also calcify the kidneys. “As more phosphate goes through the kidney, it accelerates microcalcification of the kidney’s tubules,” Block explains.

Is the evidence strong enough to say

Basketful of Phosphates?

Companies add phosphates to these foods and thousands more without providing evidence that phosphates are safe for kidneys, arteries, and the heart.



that high phosphorus levels *cause* heart and kidney damage?

“We have pretty universal agreement that phosphates added to foods could cause harm,” says Block. “But you’re not going to stand up and pound your fist on the table that the data is conclusive.”

To get good answers, scientists have to see if people without kidney disease who consume more phosphorus are at greater risk.

But knowing how much phosphorus people eat is nearly impossible.

In most studies, says Uribarri, “dietitians ask, ‘What did you eat today?’ And then they go to databases to look up phosphorus levels.”

But the databases don’t take into account that we absorb more phosphorus from some sources than from others.

“The naturally occurring phosphate in plants is less well absorbed than phosphate in animal protein,” says Uribarri. “And the phosphate added in food processing is much better and rapidly absorbed than the phosphate in its natural state. So just asking people what they eat may not give you the best picture.”

What’s more, phosphate levels vary widely from brand to brand, and phosphorus shows up in unexpected foods.

“A Revive Fruit Punch Vitaminwater has a ridiculous amount of phosphate—about 260 milligrams—whereas a Focus Kiwi-Strawberry Vitaminwater has virtually none,” says Block, referring to a 2013 analysis.¹¹ “And food manufacturers keep changing their ingredients.”

He and others want Nutrition Facts labels to say how much phosphorus a food contains. That’s crucial for people

with kidney disease, many of whom have to limit phosphorus.

Without food labeling, “it’s impossible for people to restrict their phosphate intake to a certain level,” says Block. “Honestly, there is no way a human being can figure it out.”

A more basic question: Why does the Food and Drug Administration allow



David White didn’t know that he had kidney disease until his kidneys failed.

companies to add phosphates to foods without showing that levels in the food supply are safe?

“We’re exposing people to a possible risk for decades without doing anything,” says Block. “The onus should be on companies to show that the phosph-

phates added to foods don’t cause harm.”

In the meantime, millions of people with kidney disease are on their own.

David White had a kidney transplant in 2015. “It’s given me my life back,” he says. “No more dialysis.”

He takes anti-rejection drugs and steroids, and, like Rae-Garwood, he gets exercise and has to watch what he eats.

“I’ve changed my diet radically,” says Rae-Garwood. “I

have to limit the three P’s—protein, potassium, and phosphorus. I’m restricted to 5 ounces of protein a day. We have no red meat in the house. Any product above 7 or 8 percent of a day’s worth of sodium I don’t buy.

“And you know what? It’s fine. It’s been nine years now, and I’ve been able to keep my GFR around 50.”

Both patients are now advocates for preventing kidney disease. “I’ve written four books and almost 400 weekly blogs, and I post a daily fact about chronic kidney disease on Facebook,” says Rae-Garwood. White chairs the Mid-Atlantic Renal Coalition’s patient advisory committee, among other things.

“Get tested,” urges Rae-Garwood. “Millions of people have chronic kidney disease and don’t even know it. All it takes is a blood and urine test.” 🍌

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- 3 *Am. J. Kidney Dis.* 62: 267, 2013.
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