

DIABETES DEFENSE

How to slash your risk

BY BONNIE LIEBMAN

One out of three U.S. adults have prediabetes. Nine out of ten of them don't know it. The good news: A healthy diet and exercise can cut their risk of diabetes in half. And that's for people whose risk is already high.

"We could prevent about 90 percent of type 2 diabetes in the United States if we could keep everyone at low risk," says Walter Willett, of the Harvard T.H. Chan School of Public Health. Here's how.



I had prediabetic blood sugar readings," says retired administrative assistant Lou Ann Adams, who lives north of Omaha.

"I was a little overweight and

then I had a hip replacement, and that really put on the weight. But since I started the program, I've lost 50 pounds, and I never want to gain it back."

Adams is talking about the year-long Diabetes Prevention Program, which helps people with prediabetes dodge the disease by changing what they eat and how much they move. Left alone, 15 to 30 percent of people with prediabetes end up with diabetes within five years. (See "The Path to Diabetes," p. 5.)

"The program tells you how to eat out and how to do holidays," says Adams, 62. "It tells you what to look for on labels. I thought I knew how to eat correctly, but it was eye opening. And Jeannie, the program leader, lost weight with us."

A year after the program ended, Lou Ann and her husband still go to the gym almost daily. "I do cardio three times a week and strength twice a week," she

says. "It's about an hour a day, but it gives you more energy to do everything."

"Now my blood sugars are normal, my cholesterol's down, my blood pressure's down," says Adams.

She joined a DPP program at the

University of Nebraska Medical Center, but they're also offered online or by local groups across the country.

"It could be anything from a church to a health system to the YMCA," says Judith Wylie-Rosett, who heads the division of health promotion and nutrition research at the Albert Einstein College of Medicine in New York.

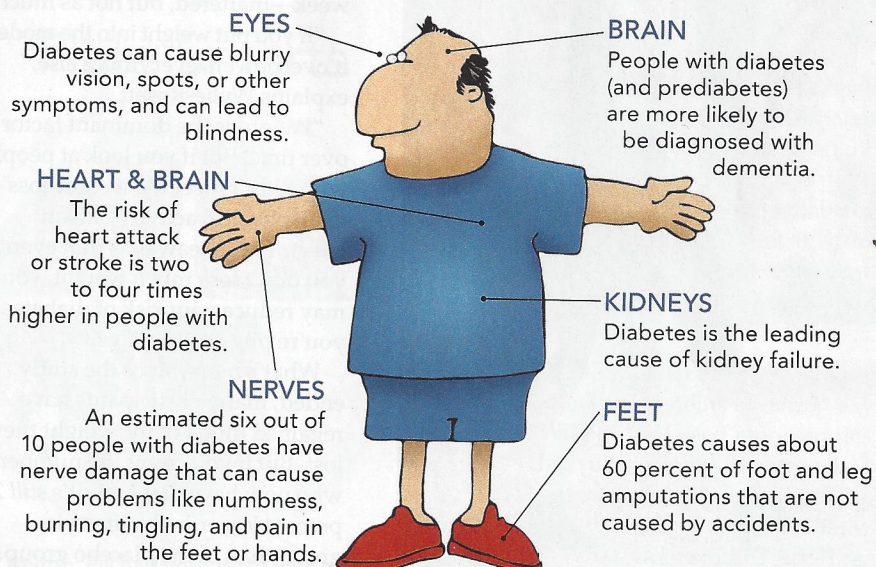
As long as programs meet standards set by the Centers for Disease Control and Prevention, they're covered by some insurance plans and, starting in 2018, by Medicare.

Why? Preventing diabetes is far cheaper than treating it.



From Head to Toe

Diabetes strikes nearly every part of the body. Among them:



Sources: Centers for Disease Control and Prevention, American Diabetes Assoc., American Heart Assoc.

And study after study has shown that programs like the DPP work.

The DPP Study

"It's amazing that a study on lifestyle, not medication, has changed the way we care for patients," says Wylie-Rosett.

She's talking about the Diabetes Prevention Program study, which randomly assigned roughly 3,200 overweight people with prediabetes to take either metformin (a drug that lowers blood sugar) or a placebo or to a lifestyle (diet-plus-exercise) group.¹

In 2001, researchers halted the study a year early because the difference between groups was so stark.

"The lifestyle group had a 58 percent lower risk of diabetes than the placebo group," says Wylie-Rosett, who was one of the DPP investigators. Results were similar in trials in Europe and Asia.²

Metformin cut the risk of diabetes by only 31 percent.

"And the risk dropped by 70 percent among people in the lifestyle group who were over 60," notes Wylie-Rosett. "It was really dramatic."

What mattered most: whether the participants lost weight, even though they didn't lose much.

"The weight loss was 7 percent of their

body weight at six months, and by three years it was only 5 percent," says Wylie-Rosett.

The exercise goal—150 minutes a week—mattered, but not as much.

"If you put weight into the model, it overpowers everything else," explains Wylie-Rosett.

"Weight is the dominant factor over time. But if you look at people who didn't meet the weight-loss goal, physical activity had an effect. The takeaway is that even if you don't lose much weight, you may reduce your risk of diabetes if you're physically active."

What's more, since the study ended, many participants have regained much of the weight they lost. But if you count the number who now have diabetes, it's *still* 27 percent lower in the lifestyle group than in the placebo group.³

"After 10 years, there was no difference in weight loss...but the difference in the development of

diabetes persisted," explained Rena Wing, a DPP investigator at Brown University, to members of the National Academy of Medicine in October.

"That suggests that there's a legacy effect, so that if you lose weight, even if you regain it, there's a positive long-term impact of that period of weight loss."

"We investigators were probably as surprised as others that the program had a long-term effect even after people regained weight," says Wylie-Rosett. "The bottom line is that a healthy lifestyle may lower the risk of diabetes even if you can't see it on the scale."

Which Diet?

What did people in the Diabetes Prevention Program eat?

"The original DPP used a low-fat diet," notes Wylie-Rosett. "We used fat grams as a way of counting calories." For people who aren't good at math, it's easier to shoot for, say, 50 grams of fat a day than for 1,500 calories. "If people weren't

Are You at Risk?

Write your score in the box

How old are you?

- Less than 40 years (0 points)
- 40-49 years (1 point)
- 50-59 years (2 points)
- 60 years or older (3 points)

Are you a man or a woman?

- Man (1 point) Woman (0 points)

If you are a woman, have you ever been diagnosed with gestational diabetes?

- Yes (1 point) No (0 points)

Do you have a mother, father, sister, or brother with diabetes?

- Yes (1 point) No (0 points)

Have you ever been diagnosed with high blood pressure?

- Yes (1 point) No (0 points)

Are you physically active?

- Yes (0 points) No (1 point)

What is your weight status?

(see chart at right)

If you scored 5 or higher:

You are at increased risk for prediabetes or type 2 diabetes. However, only a blood test can tell for sure.

Add up your score

Height	Weight (lbs.)		
4' 10"	119-142	143-190	191+
4' 11"	124-147	148-197	198+
5' 0"	128-152	153-203	204+
5' 1"	132-157	158-210	211+
5' 2"	136-163	164-217	218+
5' 3"	141-168	169-224	225+
5' 4"	145-173	174-231	232+
5' 5"	150-179	180-239	240+
5' 6"	155-185	186-246	247+
5' 7"	159-190	191-254	255+
5' 8"	164-196	197-261	262+
5' 9"	169-202	203-269	270+
5' 10"	174-208	209-277	278+
5' 11"	179-214	215-285	286+
6' 0"	184-220	221-293	294+
6' 1"	189-226	227-301	302+
6' 2"	194-232	233-310	311+
6' 3"	200-239	240-318	319+
6' 4"	205-245	246-327	328+

You weigh less than the amount in the left column (0 points)

Source: American Diabetes Association.



Shoot for a half hour of *brisk* walking daily to lower your risk of diabetes. And if you have diabetes, get up and move every half hour.

losing weight, they started counting calories," she adds.

Eating less fat got people to cut calories, but it wasn't ideal. The diet didn't emphasize cutting sugary drinks or sweets (unless they were fatty) or white-flour carbs.

"The low-fat diet was in vogue at the time, but we can do better than that," says Walter Willett, chair of the nutrition department at the Harvard T.H. Chan School of Public Health.

Would a low-carb diet make the pounds melt away? "The short-term effects of a low-carb diet seem to be better," says Wylie-Rosett. "But the long-term effects are fairly similar."^{4,5}

That's why The Obesity Society and other health authorities recommend a low-carb, a low-fat, or a dozen other diets to lose weight.⁶

"The problem with some studies that make sensational claims about low-carb diets is that they only report on completers," says Wylie-Rosett. "In one study from Duke, about half the people dropped out. People who had trouble sticking to the diet just didn't come back."⁷

That said, cutting back on carbs is a great way to cut calories. For starters, sodas and other sugary beverages unquestionably cause weight gain.⁸

What's more, carbs are easy to see. You may not know if a sauce or soup or sandwich is fatty. But you know if you're eating a bagel, pizza crust, burrito, quesadilla, bowl of noodles, muffin, doughnut, cupcake, cookie, ice cream, or milkshake.

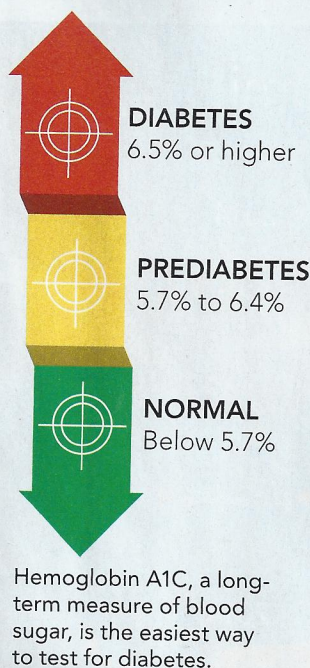
The bottom line: "You can lose weight with a low-fat diet or a low-carbohydrate diet," said Wing.

"The weight loss will be the same if you reduce your calories the same. You want to select a diet that [you] will adhere to and that will restrict calories."

Beyond the DPP

Intervention trials like the DPP show that diet-and-exercise programs can cut your risk of diabetes in half.

And in the Nurses' Health



Study, which tracked 85,000 women for 16 years, those with the healthiest lifestyles had about a 90 percent lower risk of diabetes than those with unhealthy lifestyles (though something else about those women may explain some of that lower risk).⁹

Other evidence from studies that observe people instead of enrolling them in programs:

■ **Unhealthy carbs.** "Cutting back on unhealthy carbohydrates—basically white

The Path to Diabetes

What leads to type 2 diabetes? The trigger seems to be insulin resistance (or insulin insensitivity).

Insulin acts as a key that allows blood sugar to enter cells, where it can be burned for fuel or stored for later. But in some people, especially those who are overweight, the key can't open the lock.

To compensate for that insulin resistance, the pancreas pumps out more and more insulin. If it's not quite enough, blood sugar creeps up to "prediabetes" levels.

"But after years of stress on the pancreas to produce more insulin, the pancreatic cells deteriorate and can't keep up with the demand," says Harvard's Walter Willett.

That's when blood sugar reaches the "diabetes" range.

flour and other refined starch, sugar, and potatoes—is helpful," says Willett. In his recent study on 70,000 women, those who ate more starch and less fiber had a higher risk of diabetes.¹⁰

■ **Sugar drinks.** "There's about a 25 percent increase in the risk of diabetes for each 12 oz. serving of sugar-sweetened beverages per day," notes Willett.¹¹

And only about half of that increased risk is due to weight gain. "It's also probably due to the high amount of unhealthy carbohydrate that is gulped down in a few minutes."

■ **Meat.** "Both processed and unprocessed red meat are related to a higher risk of type 2 diabetes, consistently and quite strongly in all of our studies," says Willett.¹²

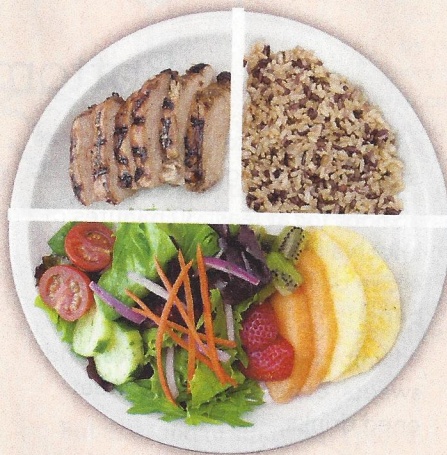
"If you want to keep diabetes risk low, replace red meat with some beans, nuts or other plant sources of protein, or some dairy, poultry, or fish."

■ **Dairy.** "There is always hype about the benefits of dairy," says Willett. "We need more studies, but so far it looks like yogurt—but not overall dairy—seems to reduce the risk of type 2 diabetes."¹³

What about studies reporting a lower risk of diabetes in people with high blood levels of dairy fat?¹⁴

"Those levels are not good

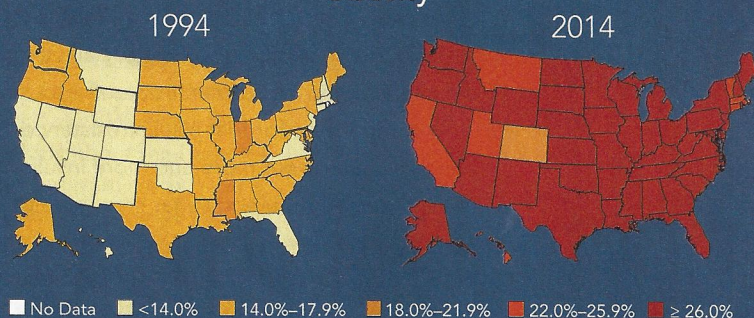
Plate Smarts



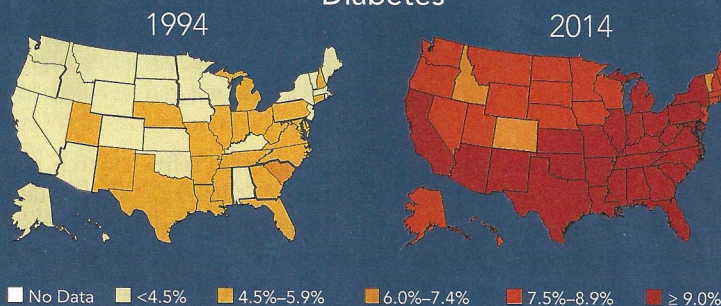
Rule of thumb: Fill half your plate with vegetables and/or fruit, a quarter with plant or animal protein, and just a quarter with (preferably whole) grains.

Diabetes Tsunami

Obesity



Diabetes



The obesity epidemic has led to a steep rise in diabetes over the last 20 years. And it's global. Worldwide, the number of adults living with diabetes has almost quadrupled since 1980, says the World Health Organization.

measures of dairy intake," he explains. "And they're influenced by an individual's metabolism. That's tricky because diabetes is a disease of disturbed metabolism."

■ **Coffee.** In Willett's studies, each daily cup of coffee was linked to a 4 to 8 percent lower risk of diabetes.¹⁵

"It's probably due to the flavonoids and antioxidants in coffee," he notes, "because it looks like decaffeinated coffee has a similar benefit."

■ **Magnesium.** People who consume more magnesium-rich foods—like leafy greens, beans, nuts, and whole grains—have a lower risk of progressing from prediabetes to diabetes.¹⁶ But something else about those people may account for their lower risk.

■ **Vitamin D.** People with low vitamin D levels have a higher risk of diabetes. But so far, most studies that give vitamin D or a placebo to people with prediabetes have come up empty.¹⁷ Stay tuned.

■ **Selenium.** People over age 62 who were given selenium supplements (200 micrograms a day) for roughly three years were twice as likely to get type 2 diabetes as those who got a placebo.¹⁸ Stick to a multi-

vitamin with no more than about 100 mcg.

The good news: you can cut your risk of diabetes quickly.

"If you make a change in your diet or lifestyle today, you're taking your foot off the accelerator, and that happens almost overnight," says Willett. "If you exercise today, your insulin resistance goes down within hours. And if you keep up the daily exercise, within a day or two your risk of diabetes drops."

Changing your diet might take longer to make a difference, but it's a matter of weeks, not years. "Even if you're right at the brink of diabetes, you can still rapidly reduce your risk," says Willett.

DPP participant Lou Ann Adams would agree. "Don't give up and don't think you can't do it," she says. "Nothing tastes as good as being healthy feels. Who wants to get diabetes." 🍌

- ¹ *N. Engl. J. Med.* 346: 393, 2002.
- ² *Ann. Intern. Med.* 163: 437, 2015.
- ³ *Lancet Diabetes Endocrinol.* 3: 866, 2015.
- ⁴ *Diabetes Care* 32: 1147, 2009.
- ⁵ *JAMA* 312: 923, 2014.
- ⁶ *Circulation* 129: S102, 2014.
- ⁷ *Nutr. Metab.* 5: 36, 2008.
- ⁸ *N. Engl. J. Med.* 367: 1397, 2012.
- ⁹ *N. Engl. J. Med.* 345: 790, 2001.
- ¹⁰ *Am. J. Clin. Nutr.* 102: 1543, 2015.
- ¹¹ *Diabetes Care* 33: 2477, 2010.
- ¹² *Am. J. Clin. Nutr.* 94: 1088, 2011.
- ¹³ *BMC Med.* 12: 215, 2014.
- ¹⁴ *Circulation* 133: 1645, 2016.
- ¹⁵ *Am. J. Clin. Nutr.* 97: 155, 2013.
- ¹⁶ *Diabetes Care* 37: 419, 2014.
- ¹⁷ *J. Clin. Endocrinol. Metab.* 99: 3551, 2014.
- ¹⁸ *J. Natl. Cancer Inst.* 108: djw152, 2016.

Bottom Line

- The best way to dodge diabetes is to lose (or not gain) extra pounds.
- Shoot for at least 30 minutes of brisk walking or other aerobic exercise daily. Avoid sitting for long periods.
- Limit white flour, potatoes, and sweets, especially sugar-sweetened drinks.
- Replace red and processed meat with beans, nuts, soy, poultry, fish, or dairy.
- Drink regular or decaf coffee if you like it.
- Take a multivitamin with no more than 100 mcg of selenium.
- It's too early to know if dairy, magnesium, or vitamin D affects diabetes risk.
- If you have prediabetes, find a CDC-recognized in-person or online Diabetes Prevention Program near you. (Go to: cdc.gov/diabetes/prevention.)