

Am I at Risk for Type 2 Diabetes?

Taking Steps to Lower Your Risk of Getting Diabetes

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What is type 2 diabetes?

Diabetes is a disease in which blood glucose levels are above normal. People with diabetes have problems converting food to energy. After a meal, food is broken down into a sugar called glucose, which is carried by the blood to cells throughout the body. Cells use the hormone insulin, made in the pancreas, to help them process blood glucose into energy.

People develop type 2 diabetes because the cells in the muscles, liver, and fat do not use insulin properly. Eventually, the pancreas cannot make enough insulin for the body's needs. As a result, the amount of glucose in the blood increases while the cells are starved of energy. Over the years, high blood glucose damages nerves and blood vessels, leading to complications such as heart disease, stroke, blindness, kidney disease, nerve problems, gum infections, and amputation.

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Can type 2 diabetes be prevented?

Research has demonstrated that people at risk for type 2 diabetes can prevent or delay developing type 2 diabetes by losing a little weight. The results of the Diabetes Prevention Program (DPP) showed that moderate diet changes and exercise can delay and prevent type 2 diabetes. Participants in this federally funded study of 3,234 people at high risk for diabetes experienced a 5- to 7-percent weight loss. That's 10 to 14 pounds for a 200-pound person.

Study participants were overweight and had higher than normal levels of blood glucose, a condition called pre-diabetes (impaired glucose tolerance). Both pre-

diabetes and obesity are strong risk factors for type 2 diabetes. Because of the high risk for diabetes among some minority groups, about half of the DPP participants were African American, American Indian, Asian American, Pacific Islander, or Hispanic American/Latino.

DPP participants also included others at high risk for developing type 2 diabetes, such as women with a history of gestational diabetes and individuals aged 60 and older.

The DPP tested two approaches to preventing diabetes: a program of healthy eating and exercise (lifestyle change), and the diabetes drug metformin. People in the lifestyle change group exercised about 30 minutes a day 5 days a week, usually by walking, and lowered their intake of fat and calories. Those who took the diabetes drug metformin received information on exercise and diet. A third group only received information on exercise and diet.

The results showed that people in the lifestyle change group reduced their risk of getting type 2 diabetes by 58 percent. Average weight loss in the first year of the study was 15 pounds. Lifestyle change was even more effective in those 60 and older. They reduced their risk by 71 percent. People receiving metformin reduced their risk by 31 percent.

Types of Diabetes

The three main kinds of diabetes are type 1, type 2, and gestational diabetes.

Type 1 Diabetes

Type 1 diabetes, formerly called juvenile diabetes or insulin-dependent diabetes, is usually first diagnosed in children, teenagers, or young adults. In this form of diabetes, the beta cells of the pancreas no longer make insulin because the body's immune system has attacked and destroyed them. Treatment for type 1 diabetes includes taking insulin shots or using an insulin pump, making wise food choices, exercising regularly, taking aspirin daily (for some), and controlling blood pressure and cholesterol.

Type 2 Diabetes

Type 2 diabetes, formerly called adult-onset or noninsulin-dependent diabetes, is the most common form of diabetes. People can develop type 2 diabetes at any age, even during childhood. This form of diabetes usually begins with insulin resistance, a condition in which fat, muscle, and liver cells do not use insulin properly. At first, the pancreas keeps up with the added demand by producing more insulin. In time, however, it loses the ability to secrete enough insulin in response to meals. Being overweight and inactive increases the chances of developing type 2 diabetes. Treatment includes taking diabetes medicines,

making wise food choices, exercising regularly, taking aspirin daily (for some), and controlling blood pressure and cholesterol.

Gestational Diabetes

Some women develop gestational diabetes late in pregnancy. Although this form of diabetes usually goes away after the baby is born, a woman who has had gestational diabetes is more likely to develop type 2 diabetes later in life. Gestational diabetes is caused by the hormones of pregnancy or a shortage of insulin.

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What are the signs and symptoms of type 2 diabetes?

More than 6 million people in the United States have type 2 diabetes and do not know it. Many have no signs or symptoms. Symptoms can also be so mild that you might not even notice them. Some people have symptoms but do not suspect diabetes.

Here is what to look for:

- increased thirst
- increased hunger
- fatigue
- increased urination, especially at night
- weight loss
- blurred vision
- sores that do not heal

Many people do not find out they have the disease until they have diabetes complications, such as blurry vision or heart trouble. Finding out early if you have diabetes is important because treatment can prevent damage to the body from diabetes.

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Should I be tested for diabetes?

Anyone 45 years old or older should consider getting tested for diabetes. If you are 45 or older and overweight ([see BMI chart](#)), getting tested is strongly recommended. If you are younger than 45, overweight, and have one or more of the risk factors on page 5, you should consider testing. Ask your doctor for a fasting blood glucose test or an oral glucose tolerance test. Your doctor will tell you if you have normal blood glucose, pre-diabetes, or diabetes.

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What does having pre-diabetes mean?

Pre-diabetes means your blood glucose is higher than normal but lower than the diabetes range. It also means you are at risk for getting type 2 diabetes and heart disease. The good news is: You can reduce the risk of getting diabetes and even return to normal blood glucose levels with modest weight loss and moderate physical activity. If you are told you have pre-diabetes, have your blood glucose checked again in 1 to 2 years.

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Besides being older and overweight, what other factors increase my risk for type 2 diabetes?

To find out your risk for type 2 diabetes, check each item that applies to you.

- I have a parent, brother, or sister with diabetes.
- My family background is Alaska Native, American Indian, African American, Hispanic/Latino American, Asian American, or Pacific Islander.
- I have had gestational diabetes, or I gave birth to at least one baby weighing more than 9 pounds.
- My blood pressure is 140/90 mm Hg or higher, or I have been told that I have high blood pressure.
- My cholesterol levels are not normal. My HDL cholesterol ("good" cholesterol) is below 35 mg/dL, or my triglyceride level is above 250 mg/dL.
- I am fairly inactive. I exercise fewer than three times a week.
- I have polycystic ovary syndrome, also called PCOS (women only).
- On previous testing, I had impaired glucose tolerance (IGT) or impaired fasting glucose (IFG).
- I have other clinical conditions associated with insulin resistance (acanthosis nigricans).
- I have a history of cardiovascular disease.

The more items you checked, the higher your risk.

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How can I reduce my risk?

You can do a lot to lower your chances of getting diabetes. Exercising regularly, reducing fat and calorie intake, and losing a little weight can help you reduce your risk of developing type 2 diabetes. Lowering blood pressure and cholesterol levels also helps you stay healthy.

If you are overweight

Then take these steps:

- [Reach and maintain a reasonable body weight.](#)
- [Make wise food choices most of the time.](#)
- [Be physically active every day.](#)

If you are fairly inactive

Then take this step:

- [Be physically active every day.](#)

If your blood pressure is too high

Then take this step:

- [Reach and maintain a reasonable body weight.](#)
- [Make wise food choices most of the time.](#)
- [Reduce your intake of sodium and alcohol.](#)
- [Be physically active every day.](#)
- [Talk to your doctor about whether you need medicine to control your blood pressure.](#)

If your cholesterol or triglyceride levels are too high

Then take these steps:

- [Make wise food choices most of the time.](#)
- [Be physically active every day.](#)
- [Talk to your doctor about whether you need medicine to control your cholesterol levels.](#)

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Making Changes to Lower My Risk

Making big changes in your life is hard, especially if you are faced with more than one change. You can make it easier by taking these steps:

- Make a plan to change behavior.
- Decide exactly what you will do and when you will do it.
- Plan what you need to get ready.
- Think about what might prevent you from reaching your goals.
- Find family and friends who will support and encourage you.
- Decide how you will reward yourself when you do what you have planned.

Your doctor, a dietitian, or a counselor can help you make a plan. Here are some of the areas you may wish to change to reduce your risk of diabetes.

Reach and Maintain a Reasonable Body Weight

Your weight affects your health in many ways. Being overweight can keep your body from making and using insulin properly. Excess body weight can also cause high blood pressure.

Body mass index (BMI) is a measure of body weight relative to height. You can use BMI to see whether you are underweight, normal weight, overweight, or obese. Use the table on pages 10 and 11 to find your BMI.

- Find your height in the left-hand column.
- Move across in the same row to the number closest to your weight.
- The number at the top of that column is your BMI. Check the word above your BMI to see whether you are normal weight, overweight, or obese.

If you are overweight or obese, choose sensible ways to get in shape.

- Avoid crash diets. Instead, eat less of the foods you usually have. Limit the amount of fat you eat.
- [Increase your physical activity. Aim for at least 30 minutes of exercise most days of the week.](#)
- Set a reasonable weight-loss goal, such as losing 1 pound a week. Aim for a long-term goal of losing 5 to 7 percent of your total body weight.

Make Wise Food Choices Most of the Time

What you eat has a big impact on your health. By making wise food choices, you can help control your body weight, blood pressure, and cholesterol.

- Take a look at the serving sizes of the foods you eat. Reduce serving sizes of main courses (such as meat), desserts, and foods high in fat. Increase the amount of fruits and vegetables.
- Limit your fat intake to about 25 percent of your total calories. For example, if your food choices add up to about 2,000 calories a day, try to eat no more than 56 grams of fat. Your doctor or a dietitian can help you figure out how much fat to have. You can also check food labels for fat content.
- Limit your sodium intake to less than 2,300 mg (about 1 teaspoon of salt) each day.
- Talk with your doctor about whether you may drink alcoholic beverages. If you choose to drink alcoholic beverages, limit your intake to one drink (for women) or two drinks (for men) per day.
- You may also wish to reduce the number of calories you have each day. People in the DPP lifestyle change group lowered their daily calorie total by an average of about 450 calories. Your doctor or dietitian can help you with a meal plan that emphasizes weight loss.
- Keep a food and exercise log. Write down what you eat, how much you exercise—anything that helps keep you on track.
- When you meet your goal, reward yourself with a nonfood item or activity, like watching a movie.

Body Mass Index Table

[For a printer-friendly version of this table, use the pdf.*](#)

	Normal						Overweight					Obese						
BMI	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Height (inches)	Body Weight (pounds)																	
58	91	96	100	105	110	115	119	124	129	134	139	144	149	154	159	164	169	174
59	94	99	104	109	114	119	124	129	134	139	144	149	154	159	164	169	174	179
60	97	102	107	112	117	122	127	132	137	142	147	152	157	162	167	172	177	182

[For a printer-friendly version of this table, use the pdf.*](#)

	Normal						Overweight					Obese							
BMI	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
Height (inches)	Body Weight (pounds)																		
		2	7	2	8	3	8	3	8	3	8	3	8	3	8	4	9	4	
61	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185	190	
62	104	109	114	119	124	129	134	139	144	149	154	159	164	169	174	180	185	190	
63	107	112	117	122	127	132	137	142	147	152	157	162	167	172	177	182	187	192	
64	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	
65	114	119	124	129	134	139	144	149	154	159	164	169	174	179	184	189	194	199	
66	118	123	128	133	138	143	148	153	158	163	168	173	178	183	188	193	198	203	
67	121	126	131	136	141	146	151	156	161	166	171	176	181	186	191	196	201	206	
68	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	
69	128	133	138	143	148	153	158	163	168	173	178	183	188	193	198	203	208	213	
70	132	137	142	147	152	157	162	167	172	177	182	187	192	197	202	207	212	217	
71	136	141	146	151	156	161	166	171	176	181	186	191	196	201	206	211	216	221	
72	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	
73	144	149	154	159	164	169	174	179	184	189	194	199	204	209	214	219	224	229	
74	148	153	158	163	168	173	178	183	188	193	198	203	208	213	218	223	228	233	
75	152	157	162	167	172	177	182	187	192	197	202	207	212	217	222	227	232	237	
76	156	161	166	171	176	181	186	191	196	201	206	211	216	221	226	231	236	241	

	Obese			Extreme Obesity														
BMI	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54

Height (inches)	Body Weight (pounds)																	
	17	18	18	19	19	20	20	21	21	22	22	22	23	23	24	24	25	25
58	7	1	6	1	6	1	5	0	5	0	4	9	4	9	4	8	3	8
59	3	8	3	8	3	8	2	7	2	7	2	7	2	7	2	7	2	7
60	9	4	9	4	9	5	0	5	0	5	0	5	0	5	1	6	1	6
61	5	1	6	1	7	2	7	2	8	3	8	4	9	4	9	5	0	5
62	2	7	3	8	4	9	5	0	6	1	6	2	7	3	8	4	9	5
63	8	4	0	5	1	7	2	8	4	9	5	0	8	2	7	3	9	4
64	5	1	7	2	8	4	0	6	2	7	3	9	5	1	6	2	8	4
65	2	8	4	0	6	2	8	4	0	6	2	8	4	0	6	2	8	4
66	9	5	1	7	3	0	6	2	8	4	1	7	3	9	5	2	8	4
67	6	2	9	5	1	8	4	0	7	3	9	6	2	9	5	1	8	4
68	3	9	6	2	9	6	2	9	5	2	8	5	2	8	5	1	8	4
69	0	7	3	0	7	4	1	7	4	1	8	4	1	8	5	1	8	5
70	7	4	1	8	5	2	9	6	3	0	7	4	1	8	5	2	9	6
71	5	2	9	6	3	1	8	5	2	9	8	3	1	8	5	2	9	6
72	2	9	7	4	2	9	6	4	1	8	6	3	1	8	5	3	0	7
73	0	8	5	2	0	8	5	3	0	8	5	3	1	8	6	3	1	8
74	7	5	3	1	9	6	4	2	0	8	5	3	1	9	6	4	2	0
75	5	3	1	9	7	5	3	1	9	7	5	3	1	9	7	5	3	1
76	4	2	0	8	6	4	3	1	9	7	5	4	2	0	8	6	5	3

Source: Adapted from *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report*.

* pdf versions require the free [Adobe® Acrobat Reader](#) software for viewing.

Be Physically Active Every Day

Regular exercise tackles several risk factors at once. It helps you lose weight, keeps your cholesterol and blood pressure under control, and helps your body use insulin. People in the DPP who were physically active for 30 minutes a day, 5 days a week, reduced their risk of type 2 diabetes. Many chose brisk walking for exercise.

If you are not very active, you should start slowly, talking with your doctor first about what kinds of exercise would be safe for you. Make a plan to increase your activity level toward the goal of being active at least 30 minutes a day most days of the week.

Choose activities you enjoy. Here are some ways to work extra activity into your daily routine:

- Take the stairs rather than an elevator or escalator.
- Park at the far end of the parking lot and walk.
- Get off the bus a few stops early and walk the rest of the way.
- Walk or bicycle whenever you can.

Take Your Prescribed Medications

Some people need medication to help control their blood pressure or cholesterol levels. If you do, take your medicines as directed. Ask your doctor whether there are any medicines you can take to prevent type 2 diabetes.

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Hope Through Research

We now know that many people can prevent type 2 diabetes through weight loss, regular exercise, and lowering their intake of fat and calories. Researchers are intensively studying the genetic and environmental factors that underlie the susceptibility to obesity, pre-diabetes, and diabetes. As they learn more about the molecular events that lead to diabetes, they will develop ways to prevent and cure the different stages of this disease. People with diabetes and those at risk for it now have easier access to clinical trials that test promising new approaches to treatment and prevention. For information about current studies, see <http://ClinicalTrials.gov>.

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