



National Diabetes Information Clearinghouse (NDIC)

## 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 by 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 time, 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 physical activity can delay and prevent type 2 diabetes. Participants in this Federally funded study of 3,234 people at high risk for diabetes experienced an average 7-percent weight loss. For example, a 5- to 7-percent weight loss for a 200-pound person would be 10 to 14 pounds.

Study participants were overweight and had higher than normal levels of blood glucose, a condition called pre-diabetes, also called impaired glucose tolerance. Both pre-diabetes and obesity are 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, Islander, or Hispanic/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: lifestyle change—a program of health and exercise—and the diabetes drug metformin. People in the lifestyle change group exercised 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. In the first year of the study, people lost an average of 15 pounds. Lifestyle change was even more effective in those aged 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 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, controlling blood pressure and cholesterol, and taking aspirin daily—for some.

### 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. People who are overweight and inactive are more likely to develop type 2 diabetes. Treatment includes taking diabetes medicines, making wise food choices, exercising regularly, controlling blood pressure and cholesterol, and taking aspirin daily—for some.

### 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.

Symptoms include

- 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. If you find out early that you have diabetes, then you can get treatment to prevent damage to the body.

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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 the [BMI chart](#)—getting tested is strongly recommended. If you are younger than 45 and overweight, and have one or more of the [risk factors](#), you should consider getting tested. 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. Pre-diabetes also means you are at risk for getting type 2 diabetes and heart disease. However, you can reduce your 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 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, 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 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, such as 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 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 these steps:

- [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 with 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 with your doctor about whether you need medicine to control your cholesterol level](#)

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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. Consider making changes to lower 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 the most of the insulin you are using. 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 [Body Mass Index](#) 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, 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 adds up to about 2,000 calories a day, try to eat no more than 56 grams of fat. Your doctor or 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 each day.
- You may also wish to reduce the number of calories you have each day. People in the lifestyle change group lowered their daily calorie total by an average of about 450 calories. A 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 helps keep you on track.
- When you meet your goal, reward yourself with a nonfood item or activity, like watching

## Body Mass Index Table

For a printer-friendly version of this table, use the pdf.\*

BMI	Normal						Overweight						Obese					
	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	138	143	148	153	158	162	167	172
59	94	99	104	109	114	119	124	128	133	138	143	148	153	158	163	168	173	178
60	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174	179	184
61	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185	190
62	104	109	115	120	126	131	136	142	147	153	158	164	169	175	180	186	191	196
63	107	113	118	124	130	135	141	146	152	158	163	169	175	180	186	191	197	203
64	110	116	122	128	134	140	145	151	157	163	169	174	180	186	192	197	204	209
65	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210	216
66	118	124	130	136	142	148	155	161	167	173	179	186	192	198	204	210	216	223
67	121	127	134	140	146	153	159	166	172	178	185	191	198	204	211	217	223	230
68	125	131	138	144	151	158	164	171	177	184	190	197	203	210	216	223	230	236
69	128	135	142	149	155	162	169	176	182	189	196	203	209	216	223	230	236	243
70	132	139	146	153	160	167	174	181	188	195	202	209	216	222	229	236	243	250
71	136	143	150	157	165	172	179	186	193	200	208	215	222	229	236	243	250	257
72	140	147	154	162	169	177	184	191	199	206	213	221	228	235	242	250	258	265
73	144	151	159	166	174	182	189	197	204	212	219	227	235	242	250	257	265	272
74	148	155	163	171	179	186	194	202	210	218	225	233	241	249	256	264	272	280
75	152	160	168	176	184	192	200	208	216	224	232	240	248	256	264	272	279	287
76	156	164	172	180	189	197	205	213	221	230	238	246	254	263	271	279	287	295

BMI	Obese			Extreme Obesity														
	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Height (inches)	Body Weight (pounds)																	
58	177	181	186	191	196	201	205	210	215	220	224	229	234	239	244	248	253	258
59	183	188	193	198	203	208	212	217	222	227	232	237	242	247	252	257	262	267
60	189	194	199	204	209	215	220	225	230	235	240	245	250	255	261	266	271	276
61	195	201	206	211	217	222	227	232	238	243	248	254	259	264	269	275	280	285
62	202	207	213	218	224	229	235	240	246	251	256	262	267	273	278	284	289	295
63	208	214	220	225	231	237	242	248	254	259	265	270	278	282	287	293	299	304
64	215	221	227	232	238	244	250	256	262	267	273	279	285	291	296	302	308	314
65	222	228	234	240	246	252	258	264	270	276	282	288	294	300	306	312	318	324
66	229	235	241	247	253	260	266	272	278	284	291	297	303	309	315	322	328	334
67	236	242	249	255	261	268	274	280	287	293	299	306	312	319	325	331	338	344
68	243	249	256	262	269	276	282	289	295	302	308	315	322	328	335	341	348	354
69	250	257	263	270	277	284	291	297	304	311	318	324	331	338	345	351	358	365

70	257	264	271	278	285	292	299	306	313	320	327	334	341	348	355	362	369	376
71	265	272	279	286	293	301	308	315	322	329	338	343	351	358	365	372	379	386
72	272	279	287	294	302	309	316	324	331	338	346	353	361	368	375	383	390	397
73	280	288	295	302	310	318	325	333	340	348	355	363	371	378	386	393	401	408
74	287	295	303	311	319	326	334	342	350	358	365	373	381	389	396	404	412	420
75	295	303	311	319	327	335	343	351	359	367	375	383	391	399	407	415	423	431
76	304	312	320	328	336	344	353	361	369	377	385	394	402	410	418	426	435	443

Source: Adapted from *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obese 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. Most chose brisk walking for exercise.

If you are not very active, you should start slowly. Talk 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. Some ways to work extra activity into your daily routine include the following:

- 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 take your medicines as directed. Ask your doctor about medicines 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 we learn more about the molecular events that lead to diabetes, they will develop ways to prevent or cure the different stages of this disease. People with diabetes and those at risk for it now have access to clinical trials that test promising new approaches to treatment and prevention. For information about current studies, see [www.ClinicalTrials.gov](http://www.ClinicalTrials.gov).

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The National Diabetes Information Clearinghouse (NDIC) is a service of the National Institute Diabetes and Digestive and Kidney Diseases (NIDDK). The NIDDK is part of the National Institutes of Health of the U.S. Department of Health and Human Services. Established in 1978, the Clearinghouse provides information about diabetes to people with diabetes and to their families, health care professionals, and the public. The NDIC answers inquiries, develops and distributes publications, works closely with professional and patient organizations and Government agencies to coordinate resources about diabetes.

Publications produced by the Clearinghouse are carefully reviewed by both NIDDK scientists and outside experts. The original version of this booklet was reviewed by David G. Marrero, Ph.D., University School of Medicine, Diabetes Research and Training Center; and Michael L. Parch M.D., M.P.H., Associate Professor, Department of Family and Community Medicine, University of Texas Health Science Center.

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NIH Publication No. 07–4805  
December 2006

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