



Half of All Adults Will Develop Pre-Diabetic High Blood Sugar

Story at-a-glance

- ▶ Nearly half of 45-year-olds will develop prediabetes at some point during their lifetime
- ▶ Three-quarters of those with elevated blood sugar levels at age 45 will go on to develop full-blown diabetes
- ▶ Prediabetes can typically be reversed by altering your lifestyle

By Dr. Mercola

According to data from the U.S. Centers for Disease Control and Prevention (CDC), more than one out of three Americans aged 20 and older has prediabetes, a condition in which your glucose, or blood sugar, levels are higher than normal, but not yet high enough to be diagnosed as full-blown [diabetes](#).¹

For those with prediabetes (86 million Americans in all), 15 percent to 30 percent will go on to develop type 2 diabetes within five years, if no lifestyle changes are made, again according to CDC data.

These numbers are already dismal, but new data from a large study out of The Netherlands predicts the problem is only going to get worse.

Nearly Half of Adults May Develop Prediabetes

After tracking and analyzing data from about 10,000 adults for a period of 15 years, researchers found that nearly half of 45-year-olds will develop prediabetes, also known as impaired glucose metabolism, at some point during their lifetime.

Further, three-quarters of those with elevated blood sugar levels at age 45 will go on to develop full-blown diabetes, according to the study.²

While previous studies have looked into population risks of pre-diabetes, this study is among the first to consider a person's *lifetime* risk of developing this condition – which is remarkably high. If you're wondering what blood sugar levels are considered healthy:³

- 6 millimoles/per liter (108 milligrams per deciliter) or less are considered normal or healthy
- 6mmol/L and below 7mmol/L (108 to 128 mg/dl) are considered elevated or prediabetic
- 7mmol/L or greater are diagnosed as diabetes

The silver lining to this finding is that prediabetes can typically be cured by altering your lifestyle; a diagnosis does *not* mean you're destined to develop type 2 diabetes. So if you've been diagnosed with prediabetes, consider yourself lucky.

You have received a warning that many people don't get (and instead progress straight to type 2 diabetes). Now you can take steps to reverse the condition and reclaim your health. In an accompanying editorial, researchers noted:⁴

“The prevalence of type 2 diabetes is increasing worldwide, and the prevalence of the at-risk state for the disease (often termed prediabetes) is even higher.

There is good evidence that intensive lifestyle prevention programs can prevent or delay the onset of type 2 diabetes in those at high risk.”

People with Prediabetes Have an Increased Risk of Cancer

Type 2 diabetes isn't the only disease associated with prediabetes. A meta-analysis that included data from nearly 900,000 people found that those with prediabetes have a 15 percent higher risk of cancer, especially cancers of the liver, stomach, pancreas, breast, and endometrium.⁵

Excess body fat, which is known to increase both cancer and type 2 diabetes risks, is often pinpointed as the reason why people with diabetes have an increased risk of cancer, but this is only part of the equation.

In fact, the association between prediabetes and cancer remained even after the researchers controlled for body mass index (BMI).

If you have prediabetes, which is conventionally diagnosed by having a fasting blood sugar between about 100 and 125 mg/dl, you have developed insulin resistance and can no longer properly burn fat as your primary fuel.

Insulin, a hormone produced by your pancreas, is necessary to help sugar enter your cells (and get out of your bloodstream), but if you have higher than normal blood sugar levels, it means your pancreas isn't making enough insulin or your cells are becoming resistant to it.

High blood sugar levels may lead to chronic oxidative stress and high blood sugar, both of which can act as carcinogens, but there's even more to the story than this.

Your body may begin releasing more insulin in an unsuccessful attempt to control your blood sugar, resulting in high levels of insulin, which is common in people with prediabetes. Insulin, in turn, is likely a key factor why both diabetes and [prediabetes raise your risk of cancer](#).

High levels of insulin also increase your body's production of insulin-like growth factor 1 (IGF-1), which plays a key role in cell growth and proliferation. Inflammation also likely plays a role, as a good deal of evidence exists that some cancers are caused by chronic inflammation.

Both insulin and IGF-1 may affect chronic inflammation, as can elevated levels of uric acid (often caused by poor diet).

Processed Food, Sugar May Be Driving Prediabetes and Diabetes Rates Sky-High

Last year, data from the U.S. Centers for Disease Control and Prevention (CDC) showed that more than 29 million Americans were diagnosed with type 2 diabetes, a statistic researchers predicted in 2001 wouldn't be reached until 2050.^{6,7,8}

Why are rates of type 2 diabetes skyrocketing? It's largely diet-related, and a meta-review published in *Mayo Clinic Proceedings* confirmed that calories from fructose (think [high-fructose corn syrup](#)) and other added sugars are the primary drivers of prediabetes and diabetes.⁹

According to the researchers, the American Diabetes Association does not recommend restricting fructose-containing added sugars to any specific level, despite the fact that:¹⁰

“Data from animal experiments and human studies implicate added sugars (eg, sucrose and high-fructose corn syrup) in the development of diabetes mellitus and related metabolic derangements that raise cardiovascular (CV) risk.”

Too Much Fructose May Double Your Risk of Prediabetes and Diabetes

Researchers noted that fructose in particular “may pose the greatest problem for incident diabetes, diabetes-related metabolic abnormalities, and CV risk,” and added:¹¹

“There is no need for added fructose or any added sugars in the diet; reducing intake to 5 percent of total calories (the level now suggested by the World Health Organization) has been shown to improve glucose tolerance in humans and decrease the prevalence of diabetes and the metabolic derangements that often precede and accompany it.

Reducing the intake of added sugars could translate to reduced diabetes-related morbidity and premature mortality for populations.”

As a standard recommendation, I strongly advise keeping your total fructose consumption below 25 grams per day, which is about six teaspoons. If you have no signs of insulin resistance you should be able to consume fruit liberally even though it has fructose.

If you have signs of insulin resistance such as prediabetes, hypertension, obesity, or heart disease, you’d be wise to limit your total fructose consumption to 15 grams or less until your weight and other health conditions have normalized.

According to this meta-review, the research clearly shows that once you reach 18 percent of your daily calories from sugar, there’s a two-fold increase in metabolic harm that promote prediabetes and diabetes.

Non-Stick Chemical Linked to Kids' Weight Gain

Perfluorooctanoic acid (PFOA) is a chemical commonly used in non-stick cookware, and it's a known "obesogen," or chemical that may alter metabolism and lead to weight gain.

Research published in the journal *Obesity* found that children born to mothers exposed to relatively high levels of PFOA during pregnancy had more rapid body fat gain and higher body fat by the age of 8, compared to children of women exposed to lower levels.¹²

This is likely just one environmental chemical (and factor overall) that may be contributing to weight gain among children (and adults). One of the best predictors of type 2 diabetes, in turn, is being obese or overweight, as most overweight or obese individuals have some degree of insulin and leptin resistance.

Research published in the *New England Journal of Medicine* highlighted the consequences of excess weight in youth, particularly in those with severe forms of obesity.¹³

The more obese a child became, the greater their markers for heart disease and diabetes became. For instance, levels of HDL cholesterol fell, blood pressure and triglyceride levels rose, as did hemoglobin A1C levels, which are a marker of diabetes.

Research presented at the annual meeting of the European Association for the Study of Diabetes even included a case study of the youngest toddler to be diagnosed with type 2 diabetes (on record) – a 3-year-old girl who weighed about 77 pounds.¹⁴

You Can Prevent Prediabetes and Type 2 Diabetes with Diet and Exercise Changes

During the three-year Diabetes Prevention Program study, lifestyle interventions were found to be more effective than the diabetes drug metformin at preventing or delaying the development of diabetes. The study involved more than 2,700 people who were overweight or obese and had elevated blood sugar levels, which means they were at high risk of type 2 diabetes.

A recently published follow-up study monitored the group for 15 years – and lifestyle interventions were *still* more effective than metformin at preventing diabetes.¹⁵ After the initial three-year study, those who made dietary changes and exercised at moderate intensity for 15 minutes daily were 58 percent less likely to develop diabetes compared to a placebo group. Those taking metformin were 31 percent less likely to develop the disease.

How to Reverse a Diagnosis of Prediabetes or Type 2 Diabetes

The following nutrition and lifestyle modifications should be the foundation of your prediabetes or diabetes prevention and treatment plan. While making these modifications be sure to monitor your fasting insulin level. This is every bit as important as monitoring your fasting blood sugar. You'll want your fasting insulin level to be between two and four.

The higher your level, the greater your insulin resistance and the more aggressive you need to be in your treatment plan, especially when it comes to altering your diet.

- **Swap out processed foods, all forms of sugar — particularly fructose — as well as all grains, for whole, fresh food.** A primary reason for the failure of conventional diabetes treatment over the last 50 years has to do with seriously flawed dietary recommendations.

Fructose, grains, and other sugar forming starchy carbohydrates are largely responsible for your body's adverse insulin reactions, and all sugars and grains — even "healthy" grains such as whole, organic ones — need to be drastically reduced.

As mentioned, if you're insulin/leptin resistant, have prediabetes, diabetes, high blood pressure, heart disease, or are overweight, you'd be wise to limit your total fructose intake to 15 grams per day until your insulin/leptin resistance has resolved. This includes about 80 percent of Americans. The easiest way to accomplish this is by swapping processed foods for whole, ideally organic foods. This means cooking from scratch with fresh ingredients.

Processed foods are the main source of *all* the primary culprits, including high fructose corn syrup and other sugars, processed grains, [trans fats](#), artificial sweeteners, and other synthetic additives that may aggravate

metabolic dysfunction. Besides fructose, trans fat (NOT saturated fat) increases your risk for diabetes by interfering with your insulin receptors.

Healthy saturated fats do not do this. Since you're cutting out a lot of energy (carbs) from your diet when you reduce sugars and grains, you need to replace them with something. The ideal replacement is a combination of:

Low-to-moderate amount of high-quality protein.

Substantial amounts of protein can be found in meat, fish, eggs, dairy products, legumes, and nuts. When selecting animal-based protein, be sure to opt for organically raised, grass-fed or pastured meats, eggs, and dairy, to avoid potential health complications caused by genetically engineered animal feed and pesticides.

Most Americans eat far too much protein, so be mindful of the amount. I believe it is the rare person who really needs more than one-half gram of protein per pound of lean body mass.

Those that are aggressively exercising or competing and pregnant women should have about 25 percent more, but most people rarely need more than 40 to 70 grams of protein a day. To determine your lean body mass, find out your percent body fat and subtract from 100. This means that if you have 20 percent body fat, you have 80 percent lean body mass.

Just multiply that by your current weight to get your lean body mass in pounds or kilos. The chart below shows some common foods and their protein content:

Red meat, pork, poultry, and seafood average 6 to 9 grams of protein per ounce.

An ideal amount for most people would be a 3-ounce serving of meat or seafood (not 9- or 12-ounce steaks!), which will provide about 18 to 27 grams of protein

Eggs contain about 6 to 8 grams of protein per egg. So an omelet made from two eggs would give you about 12 to 16 grams of protein.

If you add cheese, you need to calculate that protein in as well (check the label of your cheese)

Seeds and nuts contain on average 4 to 8 grams of protein per quarter cup

Cooked beans average about 7 to 8 grams per half cup

Cooked grains average 5 to 7 grams per cup

Most vegetables contain about 1 to 2 grams of protein per ounce

- **As much high-quality healthy fat as you want** (saturated and monounsaturated). For optimal health, most people need upwards of *50 to 85 percent* of their daily calories in the form of healthy fats. Good sources include coconut and coconut oil, avocados, butter, nuts, and animal fats. (Remember, fat is high in calories while being small in terms of volume. So when you look at your plate, the largest portion would be vegetables.)
- **As many non-starchy vegetables as you want**
- **Exercise regularly and intensely.** Studies have shown that exercise, even without weight loss, increases insulin sensitivity.¹⁶ [High-intensity interval training](#) (HIIT), which is a central component of my [Peak Fitness program](#), has been shown to improve insulin sensitivity by as much as 24 percent in just four weeks.
- **Improve your omega-3 to omega-6 ratio.** Today's Western diet has far too many processed and damaged omega-6 fats, and is far too little omega-3 fats. The main sources of omega-6 fats are corn, soy, canola, safflower, peanut, and sunflower oil (the first two of which are typically genetically engineered as well, which further complicates matters). The optimal ratio of omega-6 to omega-3 is 1:1.

However, our ratio has deteriorated to between 20:1 and 50:1 in favor of omega-6. This lopsided ratio has seriously adverse health consequences.

To remedy this, reduce your consumption of vegetable oils (this means not cooking with them and avoiding processed foods), and increase your intake of animal-based omega-3, such as krill oil. Vegetable-based omega-3 is also found in flaxseed oil and walnut oil, and it's good to include these in your diet as well. Just know they cannot take the place of *animal-based omega-3s*.

- **Maintain optimal vitamin D levels year-round.** Evidence strongly supports the notion that vitamin D is highly beneficial for diabetes. The ideal way to optimize your vitamin D level is by getting regular sun exposure or by using a high-quality tanning bed. As a last resort, consider oral supplementation with [regular vitamin D monitoring](#) to confirm that you are taking enough [vitamin D](#) to get your blood levels into the therapeutic range of 50 to 70 ng/ml.

Also, please note that if you take supplemental vitamin D, you create an increased demand for [vitamin K2](#).

- **Get adequate high-quality sleep every night.** Insufficient sleep appears to raise stress and blood sugar, encouraging insulin and [leptin](#) resistance and weight gain. In one 10-year long study of 70,000 diabetes-free women, researchers found that women who slept less than five hours or more than nine hours each night were 34 percent more likely to develop diabetes symptoms than women who slept seven to eight hours each night.¹⁷

If you are having problems with your sleep, try the suggestions in my article "[33 Secrets to a Good Night's Sleep](#)."

- **Maintain a healthy body weight.** If you incorporate the diet and lifestyle changes suggested above you will greatly improve your insulin and leptin sensitivity, and a healthy body weight will follow in time. Determining your ideal body weight depends on a variety of factors, including frame size, age, general activity level, and genetics. As a general guideline, you might find a [hip-to-waist size index chart](#) helpful.

This is far better than BMI for evaluating whether or not you may have a weight problem, as BMI fails to factor in both how muscular you are, and

your intra-abdominal fat mass (the dangerous visceral fat that accumulates around your inner organs), which is a potent indicator of leptin sensitivity and associated health problems.

- **Incorporate intermittent fasting.** If you have carefully followed the diet and exercise guidelines and still aren't making sufficient progress with your weight or overall health, I strongly recommend incorporating [intermittent fasting](#). This effectively mimics the eating habits of our ancestors, who did not have access to grocery stores or food around the clock.

They would cycle through periods of feast and famine, and modern research shows this cycling produces a number of biochemical benefits, including improved insulin/leptin sensitivity, lowered triglycerides and other biomarkers for health, and weight loss.

Intermittent fasting is by far the most effective way I know of to shed unwanted fat and [eliminate your sugar cravings](#). Keep up your intermittent fasting schedule until your insulin/leptin resistance improves (or your weight, blood pressure, cholesterol ratios, or diabetes normalizes). After that, you only need to do it "as needed" to maintain your healthy state.

- **Optimize your gut health.** Your gut is a living ecosystem, full of both good bacteria and bad. Multiple studies have shown that obese people have different intestinal bacteria than lean people. The more good bacteria you have, the stronger your immune system will be and the better your body will function overall.

Fortunately, optimizing your gut flora is relatively easy. You can reseed your body with beneficial bacteria by regularly eating [fermented foods](#) (like natto, raw organic cheese, miso, and cultured vegetables).