

PREVENTION:

Diabetes Prevention: from Research to Practice

The numbers are staggering – an estimated 1 out of 3 adults live with prediabetes. That puts them at high risk for developing type 2 diabetes; type 2 diabetes affects about 95% of the people living with diabetes and has a lifestyle link. Type 1 diabetes is the other major type of diabetes – it is NOT linked to lifestyle and cannot be prevented; people with type 1 diabetes have to use insulin every day to live.

The risk of developing type 2 diabetes increases as we get older – half of all seniors have prediabetes and about 25% live with diabetes. Yikes – that means 75% of the elders in the U.P. are directly impacted by diabetes. They either have diabetes, or they are on the path to getting type 2 diabetes.

One of the problematic facts about prediabetes is that most people don't even know they have it. Like high blood pressure, prediabetes can be a 'silent' disease. Most people with prediabetes will have one or more of the following diabetes risk factors:

- Overweight
- 45 years of age or older
- A parent, sister or brother with diabetes
- Physically active less than 3 times a week
- If a woman, a history of gestational diabetes or polycystic ovary disease
- High blood pressure

Members of certain ethnic groups that include African Americans, Hispanic/Latino Americans, American Indians/Alaskan Natives, Asian Americans and Pacific Islanders are also more likely to develop diabetes/prediabetes. Smoking is another factor that is linked to type 2 diabetes development.

An interesting study showed that many people know what some or all of the diabetes/prediabetes risk factors are. They may even recognize that they have some of risk factors. However, they often do not correlate that to having a high personal risk of developing diabetes. This is the 'someone else not me' syndrome at work here!

Just having prediabetes increases a person's risk of having a heart attack or stroke, as well as putting them just steps away from developing type 2 diabetes. Plus, if they end up getting diabetes, health care bills may rise dramatically - on average, diabetes costs an extra \$8000 per year. Anyone have an extra \$8000 they can use to treat diabetes (or \$80,000 over the next 10 years)? People with diabetes also rate their quality of life as lower and chances of developing serious complications related to diabetes increase significantly – diabetes is the leading cause of blindness, lower leg amputations and kidney failure! Having diabetes also increases the risk of becoming disabled.

An easy paper test has been developed to help people know if they are at high risk for having or developing prediabetes/diabetes (see Appendix 1). All who score high, should see their provider and get a blood test at a lab to check for diabetes.

Along with those who score high on the paper test, EVERYONE who is age 45 or older should get a prediabetes/diabetes test at least every 3 years. Adults who are younger than 45, are overweight and

have at least one other diabetes risk factor like high blood pressure or a parent with diabetes should also get a diabetes blood test.

Testing for diabetes and prediabetes is easy and inexpensive. The most common test is to go to a lab and get a fasting glucose (blood sugar) test. Generally, an elevated test needs to be confirmed on another day. A finger stick test CAN NOT be used to test for diabetes or prediabetes. Two other tests are also used to test for diabetes; they are the oral glucose tolerance and the A1C tests. The oral glucose tolerance test checks the blood glucose level two hours after eating or drinking 75 grams of glucose. The A1C test shows what the average blood glucose level has been over the past 2 to 3 months: the test may not be accurate for everyone. See Table 1 for more details on lab values for the diagnosis of prediabetes and diabetes.

Table 1: Diagnosis of Prediabetes and Diabetes

	Fasting Glucose	A1C	Oral Glucose Tolerance Test
Normal	Under 100 mg/dL	Under 5.7%	2-h PG* under 140 mg/dL
Prediabetes	100 to 125 mg/dL	5.7% to 6.4%	2-h PG 140 to 199 mg/dL
Diabetes	126 mg/dL or higher	6.5% or higher	2-h PG 200 mg/dL or higher

*Plasma glucose

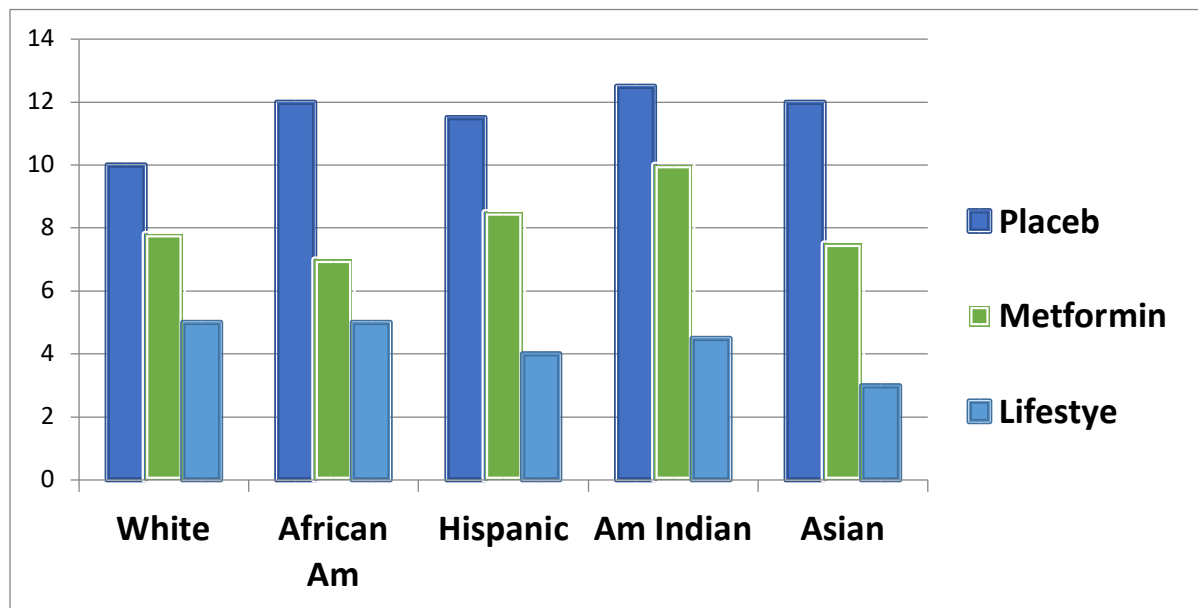
We have a huge problem that is very frightening - 90% of people living with prediabetes don't even know that they have a serious health condition. If someone is obese and has prediabetes, it almost guarantees he or she will develop type 2 diabetes unless he or she takes action to address prediabetes. What is going on? Why do so many people not know whether or not they have prediabetes – are they not getting tested, is it linked to communication with their providers or are elevated blood glucose levels not being addressed regularly? What can you do to help find Yooper's who live with prediabetes and don't know it?

Diabetes Prevention Research:

Multiple research trials have shown us that type 2 diabetes can be prevented or delayed. The U.S. Diabetes Prevention Program (DPP) included 3,234 participants; 45% were members of minority populations. In addition, people over the age of 60 were represented. The study included 3 arms – placebo, medication and lifestyle. People in the medication arm received 850 mg of metformin 2 times a day. The goals of the lifestyle arm were at least a 7% weight loss and 150 minutes of activity each week; coaches helped participants eat less fat and fewer calories to achieve their weight losses. Both the metformin and placebo groups were provided with standard advice about eating and physical activity.

The U.S. DPP showed the overall risk reduction of diabetes development was 58% with lifestyle intervention and 31% with metformin; there was some variability between racial ethnic groups. See Table 2 for details.

Table 2: DPP Results- Cases of Diabetes per 100,000



We also saw differences among age groups for the various intervention. In general, the intensive lifestyle was more effective with increasing age; people aged 60 or over reduced their risk of developing diabetes by 71% through lifestyle changes!! Metformin was effective for all racial and ethnic groups and for both men and women; it worked best in reducing the risk of developing diabetes for women with a history of gestational diabetes, for people between the ages of 25 and 44 and for participants who were obese (BMI 35 or higher).

There have also been long term studies to see if lifestyle and/or metformin continue to lower one's chance of developing type 2 diabetes over 10 to 15 years. And the answer is yes! At 10 years, people using metformin had an 18% lower risk of developing type 2 diabetes and the lifestyle group lowered their risk of developing diabetes by 34%. Risk of developing diabetes for the lifestyle group was 27% lower at 15 years.

Group Based Diabetes Prevention Programs Available in Person and Online:

Today, the Centers for Disease Control and Prevention has been facilitating the implementation of group-based Diabetes Prevention Programs (DPP), using leaders who have been through a DPP life coach training. Designed for people at high risk of developing diabetes like those with prediabetes or women who have a past history of gestational diabetes, the DPP meets approximately 16 times over the first 6 months and then once a month for the next 6 months. A curriculum has been developed to use with the Diabetes Prevention Program. The goals for the participants are a 5 to 7% weight loss and 150 minutes of physical activity each week. Some health plans, including Medicare, are paying for their members to participate in the Diabetes Prevention Program. In person and on-line programs are currently available. Research has indicated that phone and televised programs are also effective. The program is also offered in several areas across the U.P. – dial 2-1-1 or log onto www.diabetesinmichigan.org to find where diabetes prevention programs are offered in the Upper Peninsula or watch our monthly events calendar for programs in your community. Online programs like Zoom are available and convenient options for people who find it difficult to attend in person programs or do not have access to diabetes prevention programs in their regions. In addition, MSU Extension has started to offer Zoom based online diabetes prevention programs in Michigan.

Fifteen senior women attended a Diabetes Prevention Program that was offered 3 years ago at a Senior Center in the U.P – all 15 lost weight and got more active. Chris was one of the participants who was obese, had prediabetes and was told by her doctor that she would develop type 2 diabetes unless she made some lifestyle changes. She started the program at 220 pounds; one year later she was 153 pounds, her prediabetes reversed and blood pressure and lipid levels improved. In fact, she was able to stop taking blood pressure and lipid lowering medication. Two years later, Chris has continued to maintain her weight loss; often times, that is the hardest part about weight management.

Chris had reasons to take action, and she wanted to make the changes necessary to prevent type 2 diabetes. The Diabetes Prevention Program provided her with education and support. Chris got active – generally she gets about 300 to 400 minutes of activity each week. She also became a food tracker; Chris's method is to write things down as she eats them and then enter into the **free MyFitnessPal app**. She also plans meals ahead of time and keeps her refrigerator stocked with things like yogurt, fruit and ready to eat salads. If she is hungry, she grabs one of her lower calorie, healthful snacks, along with a glass of water. She also makes different choices when eating out like having baked fish instead of fried fish at the Friday night fish fry. Chris also said she feels satisfied with the food she eats – she doesn't feel deprived or hungry. In addition, Chris makes room for some 'fun foods' – in moderation. No food is off limits.

The original DPP research in the U.S. used an eating plan that lowered fat and calories. Other studies have indicated that the Mediterranean, vegetarian and Dietary Approaches to Stopping Hypertension may also be helpful in the treatment of prediabetes and prevention of type 2 diabetes.

Examples of some of the lessons that are included in the Diabetes Prevention Program

Coping with Triggers

- External Triggers –For many people, seeing food, smelling it or remembering that a particular food is in the house can trigger them to eat. How many people pass a candy dish and grab a candy or two? What about food samples at grocery stores? For some, the smell of freshly baked cookies draws them in. Many of us have foods that we just can't seem to resist like potato chips, ice cream or chocolate. For some, knowing that a certain food is in the house causes them to grab a bite, and then a little more and a little more until...empty container. A little or a lot of extra food here and there can lead to weight gain – 100 extra calories a day may yield 10 pounds of weight gain in a year.
- Fun Time Triggers: Being out with other people –eating out, socializing or at a party is usually associated with taking in more calories. People will often eat more and/or drink more when they are with other people.
- Being sad, angry, stressed or lonely are also triggers, especially if people are alone with these feelings. Some of us deal with negative emotions through eating. Finding other ways to more effectively prevent or address negative emotions, like going for a walk or phoning a friend is important.
- And sometimes you really are hungry and need to eat!!

Managing Stress

Stress can be linked to diabetes development in a couple of ways. Feelings of stress release the hormone cortisol which helps raise the blood sugar and facilitates other changes in the body to prepare you for 'fight or flight.' If you constantly feel under stress, whether it be from work, your living environment, conflicts with others, time pressures, family problems or financial issues, cortisol can work to push you toward developing type 2 diabetes. The other way that stress impacts type 2 diabetes development is through the unhealthy behaviors that often occur when a person feels 'stressed out'. When stress is high, people often choose less healthy foods to eat and may drink too much alcohol, get little to no physical activity and spend too much time in front of the screen.

Some of the ways to reduce or manage stress that are addressed in the DPP include:

- Asking for help from others
- Learning to say no
- Getting enough sleep
- Knowing yourself – what are the things that cause you stress
- Making time for fun
- Having a to-do list
- Setting small, doable goals
- Getting active
- Taking a break from whatever is stressing you out

Getting support

Losing weight and making time for physical activity most days of the week is not always easy. Having others who support a person's behavior change can be instrumental in his or her success. There may also be people who try to undermine one's behavior changes: hence, communication is key. One way to gain support for behavior changes is to tell others how they can support you - perhaps a person can be an exercise buddy, avoid buying 'food treats' for you, help you prepare healthful foods or encourage you to stick with your plan.

The Diabetes Prevention Program is a built-in support group for weight loss and being active. Some may want or need more support – joining an exercise class, walking group or biking club can be excellent ways to help someone get more active. Online support groups can be helpful for many too.

Being active

Being active is critical for type 2 diabetes prevention!

- It helps with insulin resistance – being active actually helps your body use your insulin more effectively, so that you can get the sugar that is floating around your blood stream into your cells for energy!!
- It helps maintain muscle mass.
- It supports weight loss and weight maintenance.

Eating well to manage your weight

- Keep the home environment healthy. Keep healthy ready to eat foods (like yogurt, low fat cheese and vegetables) in the refrigerator at eye level and a bowl of fruit on the table. Keep other ready to eat foods like crackers and cereal in opaque containers in the cupboard. Leave trigger foods at the store or buy them in small packages.
- Plan, plan, plan: shop with a grocery list, pack foods when you travel and plan meals ahead of time whether eating out or at home. If you are eating at someone else's home, tell them about your healthy journey and offer to bring a dish to share.
- Know how much you are eating – weigh, measure and track your food; most people underestimate how much they are eating. It is also easy to forget to track condiments, snacks and drinks! MyFitnessPal is one popular app that people use to track their food.

What do people who lose weight and keep it off do?

The National Weight Control Registry has been following more than 10,000 people who have successfully lost large amount of weight and have kept it off for long periods of time. The average registry participant has lost about 66 pounds and kept it off for 5.5 years. Here are a few of the things that they have in common:

- 55% of the participants needed help (like joining a program) to lose their weight
- 98% changed their food intake

- 94% got more active (walking was the most common type of physical activity)
- 78% eat breakfast everyday
- 75% weigh themselves at least once a week
- 62% watch less than 10 hours of TV each week
- 90% exercise every day, about 1 hour

We also need to be on the outlook for misinformation – it abounds everywhere! Many people are selling books and products to help people with weight loss and/or the prevention of health conditions like prediabetes. Often what they are selling is too good to be true and expensive (for the consumer)! Plus, it is BIG business – a 2017 market analysis indicated that Americans spent about \$66 Billion on weight loss in 2016.

What are some of the things that need to happen to conquer type 2 diabetes?

- All adults over the age of 45 should know what their fasting glucose level is.
- Adults under the age of 45 who are overweight or obese and have at least 1 other diabetes risk factor should know their fasting glucose level.
- People with prediabetes should receive treatment to help them prevent type 2 diabetes.
- Worksites, schools, churches and other community organizations need to support healthful living.
- We need policies that support healthy families and communities (such as accessible grocery stores, affordable healthful foods like fruits and vegetables and safe, walkable and bikeable communities)
- We can all play a role – it takes a widespread Yooper Commitment to prevent type 2 diabetes!

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