

UNDERSTANDING



Excess Weight

*and its Role in
Type 2 Diabetes*



This brochure is designed to help you better understand the impact of excess weight and its role in type 2 diabetes. Excess weight, obesity and severe obesity are all risk factors for developing type 2 diabetes. Often times, individuals are not aware of the health risk of excess weight until they are diagnosed with pre-diabetes or type 2 diabetes.

Through this educational brochure, we hope to provide you with the information needed to improve your quality of health. We will cover various topics, such as:

- Type 2 diabetes
- Complications of high blood sugar levels
- Risk factors for type 2 diabetes
- and much more

What is type 2 diabetes?

Type 2 diabetes is a chronic, potentially debilitating and often fatal medical condition requiring regular monitoring of an individual's blood sugar level and treatment. In type 2 diabetes, the body either does not properly produce or use insulin, a hormone produced by the pancreas that helps move sugar into cells. Therefore, the body becomes resistant to insulin. This resistance causes high blood sugar levels.

What are the complications of high blood sugar levels?

Excess sugar in the blood causes many health-related problems. The cells cannot get enough of the sugar they need, and when sugar levels in the blood become

too high, it causes damage to nerves and blood vessels, usually in the heart, feet, hands, kidneys and eyes. Other complications of high sugar and insulin resistance include:

- Increased risk of heart disease and stroke
- Neuropathy (nerve damage, especially in extremities)
- Nephropathy (renal impairment, kidney failure)
- Retinopathy (vision problems, blindness)
- Cardiovascular disease (heart disease and increased risk of stroke)
- Erectile dysfunction in men and decreased sexual desire in both men and women
- Depression
- Amputation

How Does the Body Manage Excess Glucose?

During a fast, or between meals, the body may rely on stored glucose in the liver – glycogen – for energy. Glycogen is composed of several thousand glucose molecules held together with water molecules. If the fast is very long, however, the body may instead use amino acids or fatty acids to help with its metabolic processes.

After we eat a meal, the processes of chewing and chemical digestion produce glucose (sugar), which is the most readily available for of fuel for our organs – especially muscle and brain tissue. In a normal state, the glucose produced from

these digestive processes enters our cells to help with other metabolic processes.

Insulin acts a key that unlocks the door to let glucose in to feed our cells. When insulin is present, it also turns off the process of using glycogen from the liver to ensure that the glucose level does not rise further after a meal. In fact, insulin reduces blood glucose by collecting any excess glucose that is present in the blood stream so that it can be stored as glycogen for future use.

However, if the adequate amount of insulin is not available, as is the situation in diabetes, then this glucose is unable to enter cells. Instead, the glucose remains in the blood stream in a higher than usual concentration. This condition is referred to as elevated blood glucose or hyperglycemia.

Exercise and Glucose

Exercise can also be a meaningful tool to reduce blood glucose levels. When we use our muscles, they need more fuel to stay active. In patients without diabetes, glucose is taken in from the blood stream while a simultaneous rise in the liver's glucose production keep the muscles supplied with fuel. However, when type 2 diabetes is present, the liver may not match the muscle's need for glucose, which can result in a lowering of the glucose level with moderate exercise. Thus, exercise is widely prescribed to treat patients with diabetes.

How does excess weight impact type 2 diabetes?

Excess weight can greatly affect your health in many ways, with type 2 diabetes being

one of the most serious. There are many forms of measurement used to evaluate someone's excess weight; however, the most commonly-used method is calculating your body mass index (BMI). BMI is a number calculated by dividing a person's weight in kilograms by his or her height in meters squared. BMI is a useful tool used in determining the degree of an individual's excess weight. There are five weight status categories that you may fit into:

- Underweight
- Normal weight
- Overweight
- Obesity
- Severe obesity



When an individual predisposed to diabetes has excess weight, the cells in the body become less sensitive to the insulin that is released from the pancreas. There is some evidence that fat cells are more resistant to insulin than muscle cells. Individuals affected by type 2 diabetes, who exercise, appear to reduce the severity of insulin-resistance because the exercising muscles use the extra sugar found in the blood; therefore, the body does not secrete insulin and the sugar is no longer diverted to excess fat cells.

It's not just how much an individual weighs, but also where they carry the weight that puts them at greater risk for health problems. Individuals carrying more weight around their waist (apple-shaped) are more likely to suffer from obesity-related conditions than someone who carries more weight in their hips and thighs (pear-shaped).

Individuals affected by excess weight, particularly obesity and severe obesity, are more likely to develop type 2 diabetes as a related condition of their excess weight. Obesity and severe obesity greatly increase your risk of having heart disease, type 2 diabetes, certain types of cancer, sleep apnea, osteoarthritis and much more.

To calculate your BMI, and determine your weight status category, please turn to page 15.

Are you at risk for type 2 diabetes?

What you consume throughout your day and how active you are affects your risk of developing type 2 diabetes. Being overweight (BMI of 25-29.9), or affected by obesity (BMI of 30-39.9) or severe obesity (BMI of 40 or greater), greatly increases your risk of developing type 2 diabetes. The more excess weight you have, the more resistant your muscle and tissue cells become to your own insulin hormone. More than 90 percent of people with type 2 diabetes are overweight or affected by a degree of obesity.

In addition to excess weight, there are many other factors that increase your risk of developing type 2 diabetes, such as:

Sedentary Lifestyle

Inactivity and having excess weight overweight go hand-in-hand with a diagnosis of type 2 diabetes. Muscle cells have more insulin receptors than fat cells, so an individual can decrease insulin resistance by exercising. Being more active also lowers blood sugar levels by helping insulin to be more effective.

Unhealthy Eating Habits

Unhealthy eating is a contributor to obesity. Too much fat in your diet, not enough fiber and too many simple carbohydrates all contribute to the development of type 2 diabetes.

Family History and Genetics

It appears that people who have family members with type 2 diabetes are at a greater risk for developing it themselves.



Asians, Pacific Islanders, American Indians, Alaskans, African Americans and Hispanics all have a higher rate of diabetes than Caucasians or Europeans.

Increased Age

As we age, the risk of type 2 diabetes becomes greater. Even if an elderly person is thin, they still may be predisposed to developing diabetes. The pancreas ages right along with us and doesn't pump insulin as efficiently as it did when we were younger. As our cells age, they become more resistant to insulin as well.

High Blood Pressure and High Cholesterol

These two factors are the hallmark risk factors for many diseases and conditions, including type 2 diabetes. Not only do they damage heart vessels,

but they are two key components in metabolic syndrome, a cluster of symptoms including obesity, a high fat diet and lack of exercise. Having metabolic syndrome increases the risk of heart disease, stroke and type 2 diabetes.

History of Gestational Diabetes

Women affected by obesity are more insulin resistant when compared to women of normal weight. When pregnant, gestational diabetes generally lasts the duration of pregnancy and approximately 5 to 10 percent of females with gestational diabetes will continue to be affected by diabetes after delivery.

How do you test for type 2 diabetes?

There are a variety of blood tests that may indicate whether you have type 2 diabetes. Let's take a look at each test and see what different results could mean for you and your health.

Fasting Blood Sugar Chart

Sugar Level	Indicates
Under 100 mg/dL	Normal
100 to 125 mg/dL	Prediabetes
126 mg/dL or higher on 2 separate tests	Diabetes

Fasting Blood Sugar Test

The amount of sugar in your blood naturally fluctuates but stays within a normal range. The preferred way to test your blood sugar is after fasting overnight for at least eight hours. A fasting blood sugar level less than 100 milligrams of sugar per deciliter of blood is considered normal.

If your blood sugar level measures from 100 to 125, you have impaired fasting glucose, and this may be an indication that you have pre-diabetes. If your blood sugar level is above 200 mg/dL, with symptoms of diabetes (see below), a second test may not be necessary to reach the diagnosis.

Symptoms that You May be Developing or Have Type 2 Diabetes

- Frequent urination
- Increased thirst
- Unplanned weight-loss
- Weakness and fatigue
- Numbness or tingling in hands, legs or feet
- Blurred vision
- Dry, itchy skin
- Frequent infections
- Slow healing of cuts and bruises

Random Blood Sugar Test

This test is done without any special preparation, such as fasting overnight. Even if you've recently eaten and your blood sugar level is at its peak, the level shouldn't be above 200 mg/dL. If it is and you also have symptoms of type 2 diabetes, you can expect a diagnosis of type 2 diabetes.

Oral Sugar Tolerance Test

(2-hour Post-Glucose Challenge)

This test requires you to visit a lab or a healthcare professional after at least an eight-hour fast. At the office or lab, you will drink about eight ounces of a sweet liquid that contains a lot of sugar (about 75 grams). Your blood sugar level will be measured before you drink the liquid, then after one hour and again after two hours. If your blood sugar level is 200 mg/dL or above after two hours, you may have diabetes.

What can you do to improve your health and prevent type 2 diabetes?

Losing weight is one of the most beneficial ways you can help prevent type 2 diabetes. Moderate and sustained weight-loss (5 percent to 10 percent of body weight) can improve insulin action and decrease fasting sugar concentrations.

For many individuals, simply adjusting their caloric intake and beginning an exercise program can greatly improve their type 2 diabetes and overall health.

Healthy Meal Plan

Weight-loss occurs when energy expenditure exceeds energy intake. Creating a calorie deficit will result in weight-loss. Writing down the food, portion size and calorie amount in a food diary will help you become aware of the foods you consume and provide objective evidence of calorie intake (please turn to page 16 to view the "Food Diary" section located at the end of this brochure).

Exercise Program

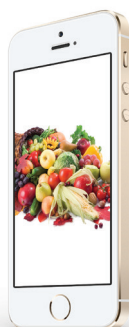
Regular exercise helps maintain weight-loss and prevent weight regain. It also improves insulin sensitivity and glycemic control (measurement of the effects of carbohydrates on blood sugar level) and may decrease the risk of developing type 2 diabetes.



A goal should be set for 30 to 45 minutes of moderate exercise five times per week. The exercise does not need to occur in a single session to be beneficial. Dividing the activity into multiple and short episodes produces similar benefits and can enhance compliance.

In addition to incorporating a healthy meal plan and exercise program, today's world of technology and social networking

may enhance a person's ability to monitor their health. There are many online and app-driven resources, such as food journals, calorie trackers, exercise tools and more available online, for your smartphone and more!



What can you do to learn more about type 2 diabetes and excess weight?

The Obesity Action Coalition (OAC), a nearly 50,000 member-strong National non-profit organization, is dedicated to representing individuals affected by the disease of obesity through education, advocacy and support. The OAC Web site, **www.ObesityAction.org**, offers hundreds of resource articles on obesity, type 2 diabetes and more.

To see if you are at risk for type 2 diabetes, please schedule a visit with a healthcare professional for more information. To help you prepare for your visit, we've provided you with some great sample questions that you may be asked by a healthcare professional and sample questions for you to ask a healthcare professional. Please see the next page and page 14 to view the "Sample Questions" section.

Sample Questions

Questions a Healthcare Professional May Ask You

- When was the last time you saw a healthcare professional?
- When did you last have blood work completed?
- Are you currently taking any medications?
- Have you been previously diagnosed with any medical conditions?
- How physically active are you on a weekly basis?
- Can you describe your eating habits?
- Does anyone in your family have type 2 diabetes?
- Do you feel fatigued or tired more than usual?
- Do you have dry-mouth or find yourself drinking fluids often?
- Do you find yourself urinating often?
- Do you have blurred vision or experience headaches?
- Have you recently gained weight?

Questions for Your Healthcare Professional

- Do you have special training in treating diabetes?
- Do you have special training in obesity?
- Does your office have a registered dietitian on staff with type 2 diabetes and obesity training?
- Do you have diabetes educators available?
- What kind of tests do you use to determine if I have type 2 diabetes?
- How do you prefer to treat someone with type 2 diabetes?
- Am I at risk for any complications associated with type 2 diabetes?



BMI CHART

OBESEITY

SEVERE OBESEITY

	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350	360	370	380	390	400
5'0"	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	65	67	69	71	72	74	76	78
5'1"	24	26	28	30	32	34	36	37	39	42	44	45	47	49	51	53	55	57	59	61	63	64	66	68	70	72	74	76
5'2"	23	25	27	29	31	33	34	36	38	40	42	44	46	48	50	51	53	55	57	59	61	62	64	66	68	70	72	73
5'3"	23	24	26	28	30	32	33	35	37	39	41	43	44	46	48	50	52	53	55	57	59	60	62	64	66	67	69	71
5'4"	22	24	25	27	29	31	32	34	36	38	40	41	43	45	46	48	50	52	53	55	57	59	60	62	64	65	67	69
5'5"	21	23	25	26	28	30	31	33	35	37	38	40	42	43	45	47	48	50	52	53	55	57	58	60	62	63	65	67
5'6"	21	22	24	25	27	29	30	32	34	36	37	39	40	42	44	45	47	49	50	52	53	55	57	58	60	62	63	65
5'7"	20	22	23	25	26	28	29	31	33	35	36	38	39	41	42	44	46	47	49	50	52	53	55	57	58	60	61	63
5'8"	19	21	22	24	25	27	28	30	32	34	35	37	38	40	41	43	44	46	47	49	50	52	53	55	56	58	59	61
5'9"	19	20	22	23	25	26	28	29	31	33	34	36	37	39	40	41	43	44	46	47	49	50	52	53	55	56	58	59
5'10"	18	20	21	23	24	25	27	28	30	32	33	35	36	37	39	40	42	43	45	46	47	49	50	52	53	55	56	58
5'11"	18	19	21	22	23	25	26	28	29	31	32	34	35	36	38	39	41	42	43	45	46	48	49	50	52	53	55	56
6'0"	17	19	20	21	23	24	25	27	28	30	31	33	34	35	37	38	39	41	42	44	45	46	48	49	50	52	53	54
6'1"	17	18	19	21	22	23	25	26	27	29	30	32	33	34	36	37	38	39	41	42	44	45	46	48	49	50	52	53
6'2"	16	18	19	20	21	23	24	25	27	28	30	31	32	33	35	36	37	39	40	41	42	44	45	46	48	49	50	51
6'3"	16	17	18	19	21	22	23	24	26	28	29	30	31	33	34	35	36	38	39	40	41	43	44	45	46	48	49	50
6'4"	15	17	18	19	20	21	23	24	26	27	28	29	31	32	33	34	35	37	38	39	40	41	43	44	45	46	48	49
6'5"	15	16	17	19	20	21	22	24	25	26	27	29	30	31	32	33	34	36	37	38	39	40	42	43	44	45	46	48

UNDERWEIGHT = LESS THAN 18.4 | NORMAL WEIGHT = 18.5 - 24.9 | OVERWEIGHT = 25 - 29.9 | OBESEITY = 30 - 39.9 | SEVERE OBESEITY = GREATER THAN 40

Food Diary

Please use this section to write down the food, portion size and calorie amount for each day. Logging the food one consumes has been found to increase awareness and provide objective evidence of a person's daily caloric intake.

Morning	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Food							
Portion							
Calories							
Afternoon							

Food						
Portion						
Calories						
Evening						
Food						
Portion						
Calories						

OAC Membership Application

Why Join the OAC?

The OAC is a nearly 50,000 member-strong 501(c)(3) National non-profit organization dedicated to giving a voice to the individual affected by the disease of obesity and helping individuals along their journey toward better health through education, advocacy and support. Our core focuses are to raise awareness and improve access to the prevention and treatment of obesity, provide evidence-based education on obesity and its treatments, fight to eliminate weight bias and discrimination, elevate the conversation of weight and its impact on health and offer a community of support for the individual affected.

1. OAC Membership Categories *(select one)*

- ☐ Individual Membership: \$20/year
- ☐ Institutional Membership: \$500/year
- ☐ Chairman's Council Membership: \$1000+/year

Are you joining for the first time, or are you renewing your OAC Membership?

- ☐ I am joining for the first time *(never been an OAC member)*.
- ☐ I am renewing my membership *(have joined the OAC in the past)*.

2. Donation Add-on

Add-on Donation: Make a General Donation

Make a tax-deductible donation to the OAC when joining as a member. Your donation helps the OAC's educational and advocacy efforts.

- ☐ \$5 ☐ \$50
- ☐ \$10 ☐ \$100
- ☐ \$25 ☐ Other _____

3. Membership/Donation Add-on Totals:

Membership Fee: +\$ _____

Donation Add-on *(optional)*: +\$ _____

TOTAL PAYMENT: \$ _____

Payment Information

☐ Check (payable to the OAC) for \$ _____.

☐ Credit card for my TOTAL, including add-ons,
of \$ _____.

- ☐ Discover®
- ☐ MasterCard®
- ☐ Visa®
- ☐ Amex®

Credit Card Number: _____

Expiration Date: _____

Billing Zip Code: _____

CV Code: _____

Contact Information

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Email: _____

JOIN ONLINE! To join the OAC online, please visit www.ObesityAction.org and click on the "Get Involved" tab.

Mail: OAC
4511 North Himes Ave. Ste. 250
Tampa, FL 33614

Fax: (813) 873-7838

Mem-UEWDBrochure

OAC Resources

The OAC provides numerous complimentary beneficial resources. To request materials, please contact the OAC National Office at (800) 717-3117 or visit www.ObesityAction.org.

Brochures/Guides

- *Understanding Obesity Series*
 - *Understanding Obesity Brochure*
 - *Understanding Severe Obesity Brochure*
 - *Understanding Obesity Stigma Brochure*
 - *Understanding Childhood Obesity Brochure*
 - *Understanding Childhood Obesity Poster*
- *Understanding Excess Weight and Type 2 Diabetes Series*
 - *Understanding Excess Weight and its Role in Type 2 Diabetes Brochure*
 - *Understanding Prediabetes and Excess Weight Brochure*
 - *Understanding Excess Weight and Type 2 Diabetes Brochure*
- *Understanding Your Weight-loss Options Brochure*
- *OAC Insurance Guide: Working with Your Insurance Provider*
- *State-Specific Advocacy Guides*

Magazine

- *Your Weight MattersSM Magazine* - OAC's quarterly education and advocacy magazine

Your Weight MattersSM

- *Your Weight Matters Campaign* – A National health and weight awareness campaign offering educational information on weight and its impact on your health. Learn more at www.YourWeightMatters.org.
- *Your Weight Matters Campaign Poster*

Multimedia

- *Excess Weight and Your Health - A Guide to Effective, Healthy Weight-loss DVD & Guidebook*

E-Newsletter

- *Obesity Action Alert* - the OAC's free monthly electronic newsletter

OAC Web Site

- The OAC Web site features an "Obesity Treatments" section which details obesity further and provides links to valuable articles concerning the topic.



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The information contained in the Understanding Excess Weight and its Role in Type 2 Diabetes brochure is not a substitute for medical advice or treatment from a healthcare professional. The OAC recommends consultation with your doctor and/or healthcare professional.



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