



**GOD'S LOVE
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Nutrition Tips for Diabetes

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**GOD'S LOVE
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The mission of God's Love We Deliver is to improve the health and well-being of men, women and children living with HIV/AIDS, cancer and other serious illnesses by alleviating hunger and malnutrition. We prepare and deliver nutritious, high-quality meals to people who, because of their illness, are unable to provide or prepare meals for themselves. We also provide illness-specific nutrition education and counseling to our clients, families, care providers and other service organizations. All of our services are provided free to clients and full of love.

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Introduction

Diabetes affects millions of Americans, with higher rates among Hispanics, non-Hispanic blacks, and Native Americans. It is estimated that 9.4% (30.3 million) of the US population has diabetes, with 1.5 million new diagnoses each year. Managing diabetes and preventing related complications can be challenging, especially for those with a new diagnosis. The key to success is finding food and lifestyle habits that work for you; there is no one-size-fits-all plan. Use this book as a general guide to help find your course.

It is recommended for people with diabetes to work with a Registered Dietitian Nutritionist (RDN) or a Certified Diabetes Educator (CDE) to create an individualized plan.



TYPE 1

The immune system mistakenly destroys the beta cells in the pancreas. When enough beta cells are gone, your pancreas stops making insulin, or makes so little insulin that you need to take insulin to survive.

TYPE 2

The body does not use insulin properly. This is called insulin resistance. At first, the beta cells make extra insulin to make up for it. But over time your pancreas can't make enough insulin to keep your blood glucose at normal levels. This type of diabetes can be managed with oral medication, but if it can't be controlled with that alone, then insulin is needed as well.

What is Diabetes?

Diabetes is a disease in which the body does not make or properly use the hormone insulin. Insulin is made by beta cells in the pancreas, and it helps glucose (sugar) from food get into the body's cells to be used as energy. When this isn't working well, the level of glucose in the blood (blood sugar) rises, causing health problems. Blood glucose is often used as a measure of health for people with diabetes, and keeping levels within a range recommended by your medical provider is crucial to preventing complications.

There are three common types of diabetes: type 1 (in which the body makes no insulin), type 2 (in which the body does not make or use insulin well), and gestational diabetes (which occurs during pregnancy). Nutrition plays a major role in managing all three types; however, the information in this book is applicable to types 1 and 2. If you have gestational diabetes, ask your medical provider for a referral to a Registered Dietitian Nutritionist or a Certified Diabetes Educator.

HOW IS DIABETES DIAGNOSED?

Diabetes is diagnosed by a blood test that measures blood glucose levels when fasting (nothing to eat or drink other than water for at least 8 hours prior). Results higher than 126 mg/dl indicate diabetes.

Test Result	Glucose mg/dl (milligrams per deciliter)
Normal	Less than 100 mg/dl
Prediabetes	100 mg/dl to 125
Diabetes	126 mg/dl or higher

MONITORING BLOOD GLUCOSE

In order to know whether your diabetes care plan is working, it is necessary to keep track of your blood glucose levels. A blood glucose check, sometimes called a fingerstick, measures your blood glucose level at that moment. Track your results in a notebook, along with notes on food eaten, how you are feeling, and activity level. Watch for trends over several days and work with your medical provider, Registered Dietitian Nutritionist, or Certified Diabetes Educator to make any needed adjustments.

The American Diabetes Association suggests the following targets for most non-pregnant adults with diabetes; individual targets, however, may differ.

- Pre-prandial glucose (before a meal): 80–130 mg/dL
- Post-prandial glucose (1-2 hrs. after beginning of the meal): Less than 180 mg/dL

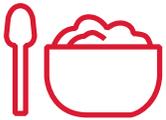
HEMOGLOBIN A1C (A1C OR HBA1C)

Hemoglobin A1C (A1C) is a blood test that measures the average level of glucose control over 90 days. While daily blood glucose monitoring results may fluctuate, the A1C gives a good picture of overall control. This test is usually done every 3-6 months, and knowing your level is an important part of monitoring your diabetes.

For most non-pregnant people with diabetes, optimal A1C levels are less than 7%. Older persons with multiple medications and limited mobility may have less strict goals, at less than 8%. Levels higher than 9% usually reveal overall poor blood glucose control. Remember that A1C goals are individual and can change over time.

The following table illustrates how A1C levels relate to average blood glucose. For example, an A1C level of 7% reflects an estimated average blood glucose level of 154 mg/dl.

A1C (%)	Blood Glucose (mg/dL)
6	126
7	154
8	183
9	212
10	240



What Affects Blood Glucose?

Many things can affect the level of glucose in the blood – food, stress, illness, and activity, to name a few. Specific foods like sugars and starches found in carbohydrates have the biggest impact on blood glucose levels. Eating a well-balanced diet that includes a mix of starches, fruits and vegetables, proteins, and fats is important to keeping blood glucose levels in check.

WHAT FOODS HAVE CARBOHYDRATES?

High-Carb Food	Low-Carb Foods	No-Carb Foods
Rice, cereal, pasta, bread, crackers, milk, fruit, fruit juice, starchy vegetables (potatoes, corn, beans, peas), soda and sweetened beverages, desserts, candies	Most vegetables (except starchy ones)	Meat, poultry, fish and oils

HEALTHY EATING BEHAVIORS

Maintaining a healthy lifestyle is one of the most effective ways to manage your diabetes and prevent complications. Making wise food choices, along with medication compliance, stress management, and consistent regular physical activity, can prevent blood glucose from spiking or going too low. You don't need to eat a perfect diet to live a healthy lifestyle. Focus on foods that honor your health and make you feel satisfied and nourished. Keep in mind, one snack or meal won't suddenly lead to or prevent major complications. It's what you eat consistently over time that matters.

Here are some healthy eating behaviors to practice daily:

- Plan meals and snacks ahead of time. Try to eat around the same time every day.
- Avoid fad diets with rigid food rules and restrictions (this includes carbohydrate restriction). Practice eating balanced meals that contain a variety of protein, fats, and carbohydrates (grains, vegetables, and fruit)

- Keep portion sizes for carbohydrates consistent and moderate; avoid eating a large portion at any one meal or snack. The chart below will help you identify which foods are high in carbohydrates.
- Consume plant-based foods like vegetables, grains, fruits, nuts, seeds, and legumes on a regular basis.
- If you drink alcohol, do so in moderation with food. General guidelines suggest women should have no more than one drink per day, and men should have no more than two drinks per day.
- Practice mindful eating by sitting down and bringing your attention to your sensations of taste, smell, sight, as well as your hunger and fullness while you eat to moderate portion size and prevent eating past comfort.
- Avoid sugary drinks like juice and soda. Replace them with water, seltzer, or unsweetened tea.
- Eat whole foods and whole grain products rather than processed foods. They contain more fiber and nutrients and do not raise blood sugar as much. See “whole food swap” below for some ideas.
- Nutritional supplements should not be used as a meal replacement or snack, unless otherwise recommended by a Registered Dietitian Nutritionist.

Use your glucometer to guide your food choices. For example, if you notice your sugar levels are elevated choose foods low in carbohydrates. If they are low, let that guide you to foods higher in carbohydrates.

THE WHOLE FOODS SWAP

Here are a few examples of how to increase whole foods

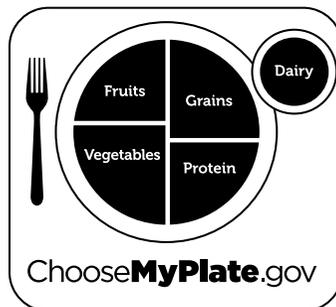
Eat this...	...instead of this.
Whole wheat bread	White bread
Brown rice	White rice
Orange	Orange juice
Old-fashioned oats	Instant oats



Plan Well-Balanced Meals

Knowing what type of food you wish to prepare, and having the ingredients on hand, are key to successful meal planning. Bearing in mind any special dietary concerns, the MyPlate model can make this job easier. Look at page 26 for meal ideas.

- **Vegetables and fruit:** $\frac{1}{2}$ of your plate
Serve vegetables with every meal as a side dish, mixed dish (soup or stew), or garnish for a sandwich. While it is important to select a wide variety of vegetables, green leafy vegetables should be served regularly. Fruit can be part of the meal, snack or dessert.
- **Protein:** $\frac{1}{4}$ of your plate
Look for lean cuts of meat (especially chicken and fish). Avoid processed meats, such as lunch meats and hot dogs. Try plant sources of protein, including beans, nuts, legumes, and tofu.
- **Grain:** $\frac{1}{4}$ of your plate
Best choices are whole grains, such as brown rice, whole wheat pasta, barley, and quinoa. Starchy vegetables, including potatoes and corn, are also included in this category.
- **Dairy:** 2-3 servings a day
Examples include milk, cheese, and yogurt.



EAT OUT SMARTLY

Dining out with diabetes may seem intimidating, but it doesn't have to be. Making wise food choices while dining out can be easy if you feel prepared.

Here are some tips for eating at restaurants:

- Snack on a piece of fruit or drink some water if waiting to be seated. This way, you are less likely to overeat.
- Talk to your server before you order. Ask them questions about the food,

how it is prepared, and for recommendations of dishes that are made with more vegetables.

- Ask for a side salad or vegetable instead of fries. Ask for dressings on the side so you can control the portion used.
- Make reservations ahead of time to make sure that you're staying consistent and eating at your normal mealtime.
- When given the choice, order from the menu rather than choosing the all-you-can-eat buffet.
- Skip the breadbasket or the tortilla chips.
- Plan to share. Restaurant portions are often larger than home portions. Share your meal with a friend or ask for a to-go box and package the extra portion at the beginning of your meal.
- Order an appetizer as your main course to reduce the amount of food you eat.
- Do not skip meals to make up for indulging one night.

Exercise and Lifestyle

Exercise or physical activity is an important part of a healthy lifestyle for people with diabetes. Studies show that decreasing the total amount of daily time sitting is helpful to maintain optimal blood glucose levels and to improve cardiovascular health. The goal is to move more and sit less.

Physical activity, especially when both aerobic and resistance exercises (see chart on next page) are combined, helps lower blood glucose levels. The action of insulin improves after exercise, thus allowing for better blood glucose control in type 2 diabetes. Physical activity can also improve your blood lipid levels, blood pressure, and overall cardiovascular risk. Most people with type 2 diabetes can engage in physical activity safely when certain precautions are taken.

If you are taking insulin or if you have type 1 diabetes, be sure to check your blood glucose before, during, and after exercise. If your blood glucose is below 100 mg/dL before exercise, eat a small snack containing carbohydrates to avoid it dropping too low. The risk of developing low blood glucose is high after exercise so self-monitoring is key. Also, if blood glucose is too high (greater than 250), the body will interpret exercise as stress and blood glucose levels may go even higher.

Special precautions need to be taken if you have neuropathy or retinopathy. You may need to engage in different, less intense exercises to protect your feet or eyes. Your exercise routine should be personalized to your needs, age, abilities and health. Be sure to consult with your medical provider before starting any exercise program.

TIPS FOR LIVING A PHYSICALLY ACTIVE LIFE:

- **Find your motivation.** Write down why you want to be more active.
- **Be Prepared.** Keep your glucose monitor on hand and check your blood sugar before starting physical activity. Exercise can lower your blood sugar so check it routinely to be sure it does not go too low.
- **Keep a snack handy.** This is helpful to prevent your blood sugar from going too low. Fruits, granola bars, yogurt, and ½ sandwich are all good examples of a healthy snack to prevent low blood sugar.

- **Take your time.** Start by doing 5-10 minutes of physical activity and as you get comfortable, increase the length or intensity of the activity you choose.
- **Stay hydrated.** Flavor your water with berries, lemons, ginger, or cucumbers for a change!
- **Don't see it as exercise.** Stay active throughout the day—gardening, cleaning, walking pets, or dancing. If you drive or take the train, try parking or getting off the train farther from your destinations to walk more.

TYPES OF PHYSICAL ACTIVITY

Aerobic Exercise	Walking, jogging, tennis, basketball, swimming or biking	These activities are best to strengthen cardiovascular health. Try to reach 30 minutes a day.
Strength Training	Pull-ups, push-ups, and/or resistance training. Some can be done seated.	These activities help build and maintain strong healthy bones. Try to reach 20-30 minutes twice or three times a week.
Flexibility Training	Stretching before and after exercise	These activities improve how well muscle and joints work and reduces muscle soreness.

MANAGE YOUR WEIGHT

Managing your weight is an important part of your overall healthcare. Lifestyle habits such as eating a well-balanced diet and being active can help achieve optimal weight. In some cases, weight loss may be recommended. It is important to remember that weight loss is a gradual process. If you set small and realistic goals that incorporate lifestyle changes, you will be more likely to maintain a healthy weight. It is important to work with healthcare professionals, such as a Registered Dietitian Nutritionist or a Certified Diabetes Educator to determine what would be a healthy weight for you and to look at your diet more carefully. These professionals can help you:

- Learn to listen to your hunger cues to form healthy behaviors and a healthy relationship with food.
- Adjust your meal plan and goals as needed.

There are many benefits to maintaining a healthy weight, such as:

- Improving your blood sugar and glycemic control.
- Allowing your body to use insulin more effectively.
- Possibly being able to lower your medication dose, or even stop taking it altogether. (Note: do not alter/stop any medication before talking to your medical provider)
- Reducing the risk of heart disease and other long-term problems that are linked to diabetes.



Medications

In addition to lifestyle choices like healthy eating and exercise, medications are often prescribed to treat diabetes. Here is some information about different types of common medications.

ORAL MEDICATIONS FOR TYPE 2 DIABETES

There are several categories of oral medications that work in different ways to lower blood glucose levels. Some work by signaling your pancreas to make more insulin. Others help your body use insulin more efficiently or block the digestion of starches. Some slow insulin breakdown. Your medical provider will prescribe the right type of medication for you.

CATEGORY	HOW THEY WORK	EXAMPLES	POSSIBLE SIDE EFFECTS
Alpha-glucosidase inhibitors	Help the body lower blood glucose (BG) levels by blocking the breakdown of starches in the intestine. They also slow the breakdown of some sugars.	acarbose (Precose) and miglitol (Glyset)	Gas and diarrhea
Biguanides	Lower BG levels by decreasing the amount of glucose produced by the liver. They also make muscle tissue more sensitive to insulin so glucose can be absorbed.	metformin (Glucophage)	Diarrhea (may not occur if taken with food)
Bile Acid Sequestrants (BASs)	Lower levels of LDL, or "bad," cholesterol in the body, which tend to be elevated in people with diabetes. They also seem to lower glucose.	colesevelam (Welchol)	Flatulence and constipation

CATEGORY	HOW THEY WORK	EXAMPLES	POSSIBLE SIDE EFFECTS
Dopamine-2 Agonists	Suppress the liver from producing glucose (gluconeogenesis).	bromocriptine (Cycloset and Parlodel)	Dizziness, spinning sensation, mild drowsiness, feeling tired.
DPP-4 Inhibitors	A new category of medications that help improve A1C without causing hypoglycemia. They allow a BG lowering compound to remain active in the body longer.	alogliptin (Nesina), linagliptin (Tradjenta), saxagliptin (Onglyza), and sitagliptin (Januvia)	Neutral or positive effect on blood cholesterol levels. Do not tend to cause weight gain.
Meglitinides	Stimulate the beta cells of the pancreas to release insulin.	nateglinide (Starlix) and repaglinide (Prandin)	Can cause hypoglycemia; can interact with alcohol to cause vomiting, flushing or sickness.
SGLT2 Inhibitors	Block the action of the kidney to reabsorb glucose so excess glucose is eliminated in the urine.	canagliflozin (Invokana), dapagliflozin (Farxiga), empagliflozin (Jardiance)	Urinary tract and yeast infections (due to increased glucose levels in the urine).

ORAL MEDICATIONS FOR TYPE 2 DIABETES (CONTINUED)

CATEGORY	HOW THEY WORK	EXAMPLES	POSSIBLE SIDE EFFECTS
Sulfonylureas	Stimulate the beta cells of the pancreas to release more insulin.	<p><i>First generation:</i> chlorpropamide (Diabinese) used since the 1950s</p> <p><i>Second generation:</i> (used in smaller doses) glimepiride (Amaryl), glipizide (Glucotrol and Glucotrol XL), and glyburide (Micronase, Glynase, and Diabeta)</p>	Different side effects for individual drugs.
TZDs (Thiazolidinediones)	Help insulin work better in muscle and fat, also reduce glucose production in the liver. Effective at reducing A1C.	Rosiglitazone (Avandia) and pioglitazone (ACTOS)	Can cause serious liver problems, and users are monitored closely. Can increase risk of heart failure or heart attack.
Oral combination therapy	Because some oral medications act in different ways to lower blood glucose levels, they may be used together.		

INSULIN

There are different types of insulin in addition to oral medications. Insulin is generally injected, but other modes of administration are becoming available. Types of insulin are outlined below:

TYPE	BEGINS TO WORK	PEAKS	WORKS FOR	EXAMPLES
Rapid-acting	15 minutes after injection	1 hour	2 to 4 hours	Insulin glulisine (Apidra), insulin lispro (Admelog, Humalog), and insulin aspart (Fiasp, NovoLog)
Regular or Short-acting	30 minutes after injection	2-3 hours	3 to 6 hours	Human Regular (Humulin R, Novolin R, Velosulin R)
Intermediate-acting	2 to 4 hours after injection	4 to 12 hours	12 to 18 hours	NPH (Humulin N, Novolin N, ReliOn)
Long-acting	Several hours after injection		Up to 24 hours	degludec (Tresiba), detemir (Levemir), and glargine (Basaglar, Lantus)
Ultra Long-Acting	6 hours after injection	Does not peak	About 36 hours	glargine u-300 (Toujeo)
Inhaled (rapid acting; must be used along with long-acting)	12 to 15 minutes	30 minutes	1.5 hours	Technosphere insulin-inhalation system (Afrezza)



Hypoglycemia and Hyperglycemia

HYPOGLYCEMIA

Low blood glucose, or hypoglycemia, occurs when the level of glucose in your blood drops below normal. For many people with diabetes, this is 70 milligrams per deciliter (mg/dl) or less. Hypoglycemia can be dangerous, and may be caused by one or more of the following:

- Skipping or delaying meals.
- Not eating enough carbohydrates when you are taking glucose-lowering medications.
- Suddenly increasing your exercise regimen.
- Drinking too much alcohol.
- An illness that restricts eating. Learn more about taking care of your diabetes when you are sick on page 20.
- Medication side effects.

Common symptoms of hypoglycemia include:

- Shaking, sweating, blurry vision, headaches, dizziness, irritability, weakness, fast or irregular heartbeat, seizures and unconsciousness.

How to treat hypoglycemia:

1. If you begin to feel any symptoms, check your blood glucose.
2. If the reading is below target or less than 70 mg/dl, eat or drink 15 grams of carbs right away.
3. Wait 15 minutes and check your blood glucose again.
4. If your glucose level is still low, eat or drink another 15 grams of carbs.



SOME EXAMPLES FOR 15 GRAMS OF CARBS

- 3-4 glucose tablets or 1 tube of glucose gel
- 4 ounces of fruit juice or regular soda
- 1 tablespoon of sugar, honey, or corn syrup
- 2 tablespoons of raisins
- 12 gummy bears or 4-6 jelly beans

5. Repeat until glucose level is back to normal.
6. If your next meal is more than 1 hour away, be sure to have a snack (crackers or fruit are good options) to keep your blood glucose level in your target range.

HYPERGLYCEMIA

Hyperglycemia, or high blood sugar, is also a concern for people with diabetes. It can happen for several reasons like skipping medication, eating too many carbohydrates at one time, or having an infection. Overtime, hyperglycemia can lead to serious complications that affect the heart, eyes, kidneys, and nerves. It is important to monitor your blood glucose carefully so that it remains within the range recommended for you. In addition, following your meal plan, taking your medication as prescribed, and adjusting it if you change your activity level can all help keep your blood glucose within your target range.

SYMPTOMS OF HYPERGLYCEMIA

Symptoms of hyperglycemia may not appear until blood glucose is already moderately high. Be alert for early symptoms like increased thirst, headaches, blurred vision, frequent urination, and weakness. If hyperglycemia goes untreated, it can cause toxic acids, or ketones, to build up in the blood and urine. This is called diabetic ketoacidosis. Blood glucose can also spike when insulin produced by the body doesn't work properly. The body is then unable to use glucose or fat for energy, and glucose is "spilled" into the urine causing frequent urination. This is called hyperglycemic hyperosmolar state. Both situations are life-threatening and emergency care is needed.

Symptoms of these include:

- Fruity-smelling breath, nausea and vomiting, shortness of breath, dry mouth, weakness, confusion, abdominal pain, and frequent urination



Sick Days

Being sick places stress on the body and raises blood glucose levels. Not eating as much when you are sick or vomiting can cause blood glucose levels to drop. It may be helpful to eat carbohydrate-rich snacks to help prevent low blood glucose. Here are some things to try:

- saltine crackers
- dry toast
- soup
- broth or bouillon
- ice pops or sherbet
- gelatin that is not sugar-free
- milk
- yogurt
- juice
- soda that is not sugar-free

Create a “sick day” plan with your medical provider so that you know what to do ahead of time, including:

- What to eat and drink.
- How often to check your blood glucose and ketones.
- Whether to adjust your diabetes medications.
- When to call your medical provider.



Diabetes and Specific Conditions

DIABETES AND CARDIOVASCULAR DISEASE (CVD)

People with type 2 diabetes are at a higher risk for cardiovascular events such as stroke and heart attack than people without diabetes. One reason is that early in the development of diabetes, high blood glucose causes the build-up of plaque in the arteries. High blood glucose levels can also change the flexibility of the arteries, making them stiffer, which affects blood flow over time. There may not be any apparent signs or symptoms that these changes are happening.

A recent study found that ups and downs in blood glucose levels can activate oxidative stress in the cardiovascular system. This process is believed to contribute to the development of atherosclerosis.

Serious health outcomes can occur especially when people with diabetes smoke, are not physically active, have elevated LDL cholesterol levels, or have elevated blood pressure.

How to reduce your risk of cardiovascular disease:

- Reduce your stress levels: listen to music, or try yoga, breathing, or meditation.
- Move more and sit less every day. Choose a physical activity that you enjoy. See page 11 for ideas.
- Quit smoking.
- Discuss target ranges with your healthcare team for:
 - A1C
 - LDL cholesterol
 - Triglycerides
 - Blood pressure levels
- Check your blood glucose and blood pressure daily.
- Read food labels - see table on next page.

Pay Attention to Food Labels to Make Heart Healthy Choices

% Daily Value is the amount of each nutrient in terms of percentage of the daily recommended amount. Look for **5%** or less of **total fat, trans fat, saturated fat, sodium and cholesterol**.

Pay attention to the **serving size** and **servings per container** in order to determine the amount of calories, sodium, and fat you are eating.

Trans fat is partially hydrogenated oil. If a food label says, “0 g of trans fat,” check the ingredient list for “partially hydrogenated oil,” which means that the food **has less than 0.5 g of trans fat per serving and should still be limited in intake.**

The first ingredient on the ingredient list is the largest in quantity.

Pay attention to the number of grams of added sugars per serving. These can also be listed in the ingredients as high fructose corn syrup, dehydrated cane juice, corn syrup, sucrose, dextrose, maltose, or agave nectar.

Follow a heart healthy diet:

Both the Mediterranean Diet and the DASH diet (Dietary Approaches to Stop Hypertension) can be effective in managing cardiovascular disease. Below are guidelines for heart-healthy eating from both approaches. See page 26 for menu ideas.

- Choose mono and polyunsaturated fats such as olive oil, canola oil, avocado, and nuts.
- Limit saturated fats. Eat less butter, lard, poultry skin, and whole milk.
- Choose protein sources that are lower in fat (i.e., fish, low-fat dairy, lean meats, tofu).
- Choose low-fat milk, cheese and yogurt.
- Add omega-3 fats into your diet, such as salmon, mackerel, tuna, flax, and chia seeds.
- Include 2 servings of fish per week.
- Limit trans fats by avoiding products with hydrogenated oils; check the ingredient list.
- Select whole grains (whole grain bread, oatmeal, buckwheat) and limit refined/white grains (cakes, muffins, white bread, pies).



HOW TO REDUCE YOUR POTASSIUM INTAKE

- Choose fruits and vegetables low in potassium: berries, pineapple, watermelon, plums, mandarin oranges, cabbage, carrots, cauliflower, cucumber, eggplant, onions, radishes, watercress.
- Soak vegetables overnight or double boil, and then drain the water to remove some potassium.

- Add oats, barley, nuts, beans, and flaxseed to your diet to increase soluble fiber intake. Shoot for 10-25 mg of soluble fiber per day.
- Have 8-10 servings of fruits and vegetables daily.
- Keep salt intake to about 2000 mg or less per day or follow your medical provider's guidelines. One teaspoon of salt has about 2,300 mg of sodium.
- Use sodium-free spices and seasonings.
- Avoid excessive alcohol intake.

DIABETES AND RENAL DISEASE

Over time, high blood glucose damages the tiny veins inside the kidneys. This can lead to a condition called diabetic kidney disease, or DKD. With kidney disease, your kidneys are no longer able to adequately filter waste from your blood. As a result, changes to what you eat and drink may be needed. If DKD is not monitored or treated correctly, the disease can progress to end stage renal disease or ESRD, in which dialysis is required. 40% of people with diabetes develop DKD over time, and DKD is a leading cause of ESRD.

If DKD progresses, your blood glucose levels will change due to the kidneys' decreased ability to excrete insulin in your urine. With more insulin circulating in your blood, low blood glucose episodes can occur frequently. Close control of blood glucose may not be advised at this point; instead, your medications may need to be adjusted. Medical care and your dietary needs will change according to the stage of kidney disease.

Things you can do to promote kidney health include:

- Check your blood glucose regularly.
- Consume fruits and vegetables that are low in potassium; vary your choices.

- Manage your fluid intake. Follow guidelines from your provider.
- Keep your salt intake low and avoid processed foods.
- Limit your intake of phosphorous rich foods. High blood levels of phosphorous can harden your arteries over time.
- Move more! Modify your activity if needed. See page 11 for ideas.

Here are some additional tips for kidney health at every stage. Find what applies to you, follow the guidelines, and talk with your healthcare team:

TYPE	TO PREVENT DKD	TO MANAGE DKD	TO MANAGE ESRD
Blood glucose	Check daily. Keep within range recommended by your medical provider.		Check daily. Avoid low AND high blood glucose levels. When the kidneys are not working, insulin stays in the blood longer and your blood sugars may drop low. Talk with your medical provider about your goals and medication.
A1C targets	Discuss with provider. Aim for level between 6.5-6.9%.	Discuss with provider. Aim for level of 7%.	Discuss with provider. Goals are very individualized.
Blood Pressure	Manage with your medical provider. Limit salt intake.		
Diet	Keep salt intake between 1500-2300 mg per day. Follow a heart-healthy, diabetic-friendly diet. See page 26 for ideas. Avoid processed foods like frozen meals and canned vegetables that are high in sodium.	Limit sodium intake to 1500- 2300 mg per day. Discuss protein, potassium and phosphorus intake with your medical provider. Your renal Registered Dietitian Nutritionist can help you create an individual plan. Take a phosphorous binder with meals if prescribed.	Your medical provider may discontinue your diabetes medication. Try not to overdo carbohydrate intake. Eating a high carbohydrate diet raises the risk of obesity and may promote the progression of cardiovascular disease.



A1C FOR THOSE WITH HIV

Note that A1C test results may underestimate levels of blood glucose control in people with HIV. Discuss this with your medical provider.

DIABETES AND HIV

Rates of diabetes are higher among people living with HIV than among the HIV negative population. While some people may already have diabetes before their HIV diagnosis, others may develop it afterwards. As people with HIV are living longer and getting older, their risk for other chronic conditions like diabetes increases. The HIV virus, and the antiretroviral therapy (ART) used to treat HIV, also contribute to the risk for diabetes. Therefore, routine screening for diabetes is an important part of HIV care.

Recommended diabetes screening schedule:

- At the time of HIV diagnosis
- Before starting ART
- Once on ART, every 6-12 months

If you have HIV and have been diagnosed with diabetes, there is a lot you can do to manage the condition.

- Discuss your medications with your medical provider. Some adjustments may be recommended.
- Stay active!
- Eat a balanced diet, rich in plants, beans, and legumes. See the next page for meal plans.
- Ask for a referral to a Registered Dietitian Nutritionist to develop a food and exercise plan that works for you.
- If you smoke, make efforts to quit.



Putting it All Together: Menu Patterns

There are several well-established patterns of eating that can help people with diabetes plan well-balanced, healthful meals, and snacks. Both the Mediterranean Diet and the DASH Diet focus on colorful plant foods, lean proteins, healthy fats, and minimally processed foods. Sample menus from both are included below. Discuss your personal plan with a Registered Dietitian Nutritionist or a Certified Diabetes Educator.

MEDITERRANEAN DIET

The Mediterranean diet refers to the types of foods consumed by people living in countries by the Mediterranean Sea. This includes fruits, vegetables, whole grains, fish, chicken, cheese/yogurt, beans, nuts, seeds, and olive oil as the main source of fat. The diet generally includes smaller amounts of meat, reduced amounts of added sugar, and reduced amounts of saturated fat found in red meat and butter.

The Mediterranean diet is an eating plan that has been shown, through research, to reduce the risk of heart disease, diabetes, metabolic syndrome, and certain types of cancers. It has been shown to reduce low-density lipoprotein (LDL) cholesterol levels in the blood, which helps to decrease the plaque buildup in your arteries. This plaque buildup can eventually lead to heart attacks and stroke. A Mediterranean diet that is slightly modified for people with diabetes can help to control blood sugar.

Mediterranean Diabetes Meal Plan

(Based on a 2,000 calorie per day diet)

Breakfast

1 slice toasted whole grain bread with 1 ounce cheese, tomato slice, drizzled olive oil
¾ cup blueberries

1 cup unsweetened Greek yogurt

Water, coffee (with low-fat milk), tea (unsweetened)

Lunch

Brown Rice and Kale Salad

- 1 cup cooked brown rice (or other whole grain)
- 1 can of sardines in olive oil or 3 ounces canned salmon, chopped
- 1 cup of chopped kale
- 1-2 Tbsp of chopped red onion
- Lemon juice and olive oil

Handful unsalted mixed nuts

1 medium apple

Water, coffee, or tea (unsweetened)

Dinner

Chicken Quinoa Bowl

- 3 ounces (size of deck of cards) of boneless, skinless chicken breast cooked with olive oil
- Topped with 2 ounces of roasted red peppers, dash of feta cheese, pepper, and parsley.
- ½ cup cooked quinoa or other whole grain

1 cup of mixed strawberries/blueberries

Water

Snacks (anytime)

2 Tbsp hummus with 4-6 whole grain crackers

DIETARY APPROACHES TO STOP HYPERTENSION (DASH)

The DASH dietary pattern is a balanced eating plan created to lower or control high blood pressure (hypertension). It can also improve other health conditions including insulin resistance, hyperlipidemia, and obesity. Because people with diabetes have a higher risk of developing hypertension and cardiovascular disease, the DASH plan is one of the eating patterns promoted for the management of diabetes. It features vegetables, fruits, and low-fat dairy products, as well as whole grains, fish, poultry, nuts, and limited portions of red meats, sweets, and sugary beverages.

DASH Sample Menu

(Based on a 2,000 calorie per day diet)

Breakfast

White omelet with spinach and goat cheese (cooked in non-stick pan)

- 2 egg whites
- ½ cup cooked spinach
- 1 ½ ounces low-fat goat cheese

1 slice 100% whole wheat bread

½ cup baked potatoes

1 medium nectarine (or 2 small ones)

1 cup fat-free milk

Coffee or tea

Lunch

Spinach salad

- 4 cups of fresh spinach leaves
- ½ cup tomatoes
- ½ cup baked sweet potatoes
- 1 Tbsp pumpkin seeds
- Vinaigrette: 2 Tbsp olive oil, lemon juice, pepper to taste

1 slice of whole wheat bread or 12 low sodium, low-fat crackers

½ cup cantaloupe or 1 medium banana

Water

Dinner

- 3 ounces (size of a deck of cards) pan-seared cod filet seared in 1 tsp olive oil
- 1 cup brown rice pilaf with vegetables
- 1/2 cup cooked greens, steamed (beet, collard, kale)
- 1 small sourdough roll
- 1 cup fresh mixed berries (chopped mint optional)
- Herbal iced tea with freshly squeezed lemon (unsweetened)

Snack (anytime)

- 1 cup fat-free, low sugar yogurt
- Handful of unsalted nuts

Glossary

Atherosclerosis: When plaque (fatty deposits) build up inside the arteries. This can lead to heart attack, stroke, or even death.

Beta Cells: Cells in the pancreas that produce insulin

Blood glucose: Concentration of glucose (sugar) in the blood

Carbohydrates: A macronutrient found mostly in sugars, starches, grains, and fibers used for energy by the body and broken down into glucose.

Diabetic ketoacidosis: Develops when there isn't enough insulin in the body and glucose can't enter the cells for energy. Blood glucose levels rise, and the body begins to break down fat for energy. This process produces toxic acids known as ketones. Excess ketones collect in the blood and eventually "spill over" into the urine. Left untreated, diabetic ketoacidosis can lead to a diabetic coma and can be life-threatening.

Glucometer: Glucose monitoring device

Glucose: A simple sugar which is the chief source of energy for cells in the body

Hemoglobin A1C: A blood test that measures average level of glucose over the past 90 days

Hyperglycemia: High blood glucose. Blood sugar higher than 130mg/dL when fasting or higher than 180 mg/dL 2 hours after you eat.

Hyperglycemic hyperosmolar state: Occurs when insulin is produced but it doesn't work properly. Blood glucose levels may become very high — greater than 600 mg/dL. Because insulin is present but not working properly, the body can't use either glucose or fat for energy. Glucose is then "spilled" into the urine, causing increased urination. Left untreated, diabetic hyperglycemic hyperosmolar state can lead to life-threatening dehydration and coma.

GLOSSARY (CONTINUED)

Hypoglycemia: Low blood glucose

Insulin: Hormone made by the pancreas which controls absorption of glucose in the blood.

Ketones: A compound made in the liver when the body does not have enough insulin to turn into sugar (glucose) energy.

Oxidative stress: An imbalance between the production of free radicals and antioxidant defenses which can damage cells and contribute to aging.

Pancreas: An organ that plays an essential role in converting the food we eat into fuel via enzymes and hormones important for digestion and regulating blood sugar.

Pre-prandial: Before a meal

Post-prandial: 1-2 hours after beginning of the meal

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