



TYPE 2



BEATING

THE ODDS

DIABETES & African-American WOMEN'S HEALTH

The African-American Woman's Guide to

# DIABETES DRUGS

**N**OT SO LONG AGO, type 2 diabetes was a disease with few treatment options. There were only two classes of medications available: the first-generation oral sulfonylureas and insulin.

Sulfonylureas usually lost their effectiveness over time and often were unable to control blood sugar. Insulin products contained impurities and were available only from animal sources.

BY LENORE THREADGILL COLEMAN, PHARMD, CDE, FASHP

Today it's a different story. We have many new oral agents (pills). Insulin is purer and available in many forms. We understand more about how diabetes affects the body and what we can do to slow or prevent diabetes complications. As a result, you now have the power to live a longer and healthier life with diabetes. You can control your diabetes, rather than having it control you.

For a detailed list of diabetes drugs for type 2 and how they work go to page 61.

### A Stumbling Block

Unfortunately, sometimes doctors are rushed and may give new patients only a few words of instruction: "Watch your diet. Get more exercise. And fill this prescription."

"Watch your diet"? Watch it do **what**?

“Get more exercise”? What does that mean?

Without clearer instructions, people leave their doctors' offices with only one concrete goal—to fill their prescription. No wonder many people believe diabetes medications are the only part of their treatment.

### What You Should Know

■ Diabetes cannot be cured. The goal is to keep it under “good” control by keeping blood sugar levels as close to normal as you can. With good control, you feel your best, and diabetes is less likely to damage your eyes, kidneys, or nerves.

■ Type 2 diabetes is a progressive disease. Over time, controlling it gets harder. You may start off taking one pill and later need to increase your dose, add a second pill, or switch to insulin.

■ Keeping your glucose (blood sugar level) under control is worthwhile, even though it gets harder. Even a small drop in your blood sugar can make a big difference in your long-term health.

■ Medications alone cannot control diabetes. Diabetes management rests on three legs: good eating habits, physical activity, and medications. Every person with type 2 diabetes should see a dietitian. Together, you can devise an eating plan that not only helps your glucose control, but also meshes with your schedule and includes foods you like.

■ Exercise, too, should be personalized. You're not stuck with the jumping jacks or team sports you dreaded in gym class. Anything that gets your heart beating fast counts—talk to

your doctor about what level of exercise is best for you. A brisk walk with your dog fits the bill. So could dancing, bicycling, even strenuous chores such as scrubbing floors or shoveling snow. If you are trying to lose weight through exercise, then ideally your exercise should get you breathing hard or even sweating. Milder exercise is still good but will give you less benefit. I recommend that African-American women exercise 30 to 45 minutes each day.

When you go to the doctor, you should have a blood test that measures your blood sugar before eating (fasting glucose) and a hemoglobin A1c (HbA1c) test, which measures blood sugar control over the past

two to three months. You should also measure your blood sugar at home one to two hours after you eat (postprandial blood sugar). As a person with diabetes, your fasting blood sugar should be between 80 and 120 mg/dl, and your postprandial blood sugar should be between 140 and 160 mg/dl. Your goal for HbA1c is 7 percent. If your HbA1c is 8 percent or higher, then your doctor should change or increase your diabetes medications and change your exercise and nutrition program.

Everyone with diabetes should monitor their blood sugars at least twice a day. Today's blood glucose monitors are accurate and easy to use

## Low BLOOD SUGAR Reactions

**L**ow blood sugar reactions can happen when blood sugar drops below 70 mg/dl or you have a rapid fall in blood sugar.

### Some of the reasons for low blood sugar are

- Delaying or skipping a meal
- Eating too little food at a meal
- Getting more exercise than usual
- Taking too much diabetes medicine

### The symptoms of low blood sugar are

- Dizziness
- Sweating

- Rapid heartbeat
- Headache
- Blurred vision
- Inability to think
- Drowsiness
- Numbness and tingling around lips
- Being hungry

### Treatments for low blood sugar include

- 1/2 cup of orange juice
- 1/3 cup of grape juice
- 1 cup (8 oz.) of milk
- 5 to 6 pieces of hard candy
- 2 Tbsp. of raisins
- 1–2 tsp. of honey

The information in this box and on pages 61 through 63 comes from American Diabetes Association: *www.diabetes.org* and *Drugs Facts And Comparison*, 54th Edition, St. Louis, Mo., Wolters Kluwer Company, 2000.

and provide instant feedback on how your diabetes treatment is working.

## The Scientific Evidence That Controlling Diabetes Works

The United Kingdom Prospective Diabetes Study—UKPDS for short—nailed down many of these points. This study, which ran from 1977 to 1997, included thousands of people with type 2 diabetes. Some people were assigned to try to control their blood sugar with diet alone. The others took diabetes pills to try to keep their blood sugar as close to normal as possible. This second group aimed for a fasting blood sugar of 108 mg/dl.

The UKPDS found that blood sugar levels tended to rise as time passed, showing that type 2 diabetes is indeed a progressive disease. At the six-year mark, 22 percent of the people on metformin and 30 percent of the people on sulfonylureas had to be switched to insulin.

The study also showed that people with good blood sugar control were less likely to get diabetic eye disease, nerve disease, or kidney disease. These wonderful results occurred because the tight-control group had an average HbA1c about 1 percent lower than the other group. This small difference in average blood sugar level made a big difference in complications.

Some people on diet therapy alone had good results. At the end of 9 years, 21 percent of study participants on diet alone were still meeting their blood sugar goals. Some doctors had doubted that diet alone could keep blood sugar under control

or that people could stick to a healthy diet long term. The UKPDS proved them wrong on both counts.

## How Your Doctor Chooses Your Medication

Ideally, the first step your doctor takes when deciding what diabetes drug to prescribe is to figure out what stage of diabetes you are in.

If your diabetes is in the early stages, your major problem is that your blood sugar levels shoot up after meals. These so-called postprandial spikes occur because your body is supposed to release a spurt of insulin when you eat, but it can no longer do this well.

In this case, doctors should choose diabetes drugs that are good at lowering glucose levels after meals. The three classes of drugs that do that are:

- Alpha-glucosidase inhibitors [acarbose (Precose) and miglitol (Glyset)]
- Meglitinides [repaglinide (Prandin)]
- Phenylalanine derivatives [nateglinide (Starlix)]

If you have had diabetes for several years, your body also has trouble producing enough basal insulin (insulin maintained at low levels between meals). The result can be constant high blood sugar levels.

In this case, doctors should choose drugs that increase insulin secretion or replace the missing insulin, such as:

- Sulfonylureas
- Insulin shots

Many people with type 2 diabetes have another problem as well: insulin resistance. A person may make plen-

ty of insulin, but the cells ignore it and refuse to take in glucose. Insulin resistance usually occurs as one of a cluster of health problems that includes being overweight, and having high blood pressure and harmful levels of blood fats such as cholesterol or triglycerides. In this case, two classes of drugs are useful:

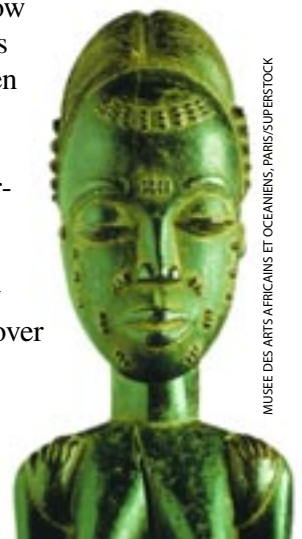
- Biguanides [metformin (Glucophage)]
- Thiazolidinediones [rosiglitazone (Avandia) and pioglitazone (Actos)]

Another problem some people have is that their liver produces too much glucose. The liver is supposed to make some glucose at night while you sleep. But sometimes it churns out so much glucose that blood sugar levels are high first thing in the morning. Metformin, which decreases the liver's glucose production, can help such people.

## How Being An African-American Woman Affects Your Medications

Until recently, drug companies routinely tested drugs only in white men. The Food and Drug Administration now requires that drugs be tested in women and minorities, too. So although sex and ethnic heritage influence how some drugs work, we are only beginning to discover these effects.

In general, women respond to drugs



MUSEE DES ARTS AFRICAINS ET OCEANIENS, PARIS/SUPERSTOCK

differently than do men in several ways:

- They have more and different side effects.
- They are more likely to get dizzy, drowsy, or confused when taking pain medicines or medicines that affect the brain.
- Some pain medicines work much better in women.
- The female body absorbs some drugs faster than the male body, which can lead to higher levels in the body.

Women who are pregnant should not take diabetes pills but should go on insulin. Breastfeeding women need to talk to their doctor because some diabetes pills can cross into milk.

Although less is known about racial differences, we do know that African Americans and whites may need different treatment routines for high blood pressure, both because they can respond differently to blood pressure drugs and because the causes of high blood pressure are not quite the same in each.

African Americans tend to get high blood pressure earlier in life than do whites. Their blood pressure levels are also usually higher, salt is more likely to raise their blood pressure, and they suffer more organ damage than whites.

In general, African Americans with high blood pressure may need more aggressive treatment than whites. They usually need to take at least two blood pressure drugs, and sometimes three, to control blood pressure. One of these drugs is usually a water pill (diuretic). Other drugs that work well are ACE inhibitors and calcium channel blockers.

Because African Americans tend

to suffer more severe effects from high blood pressure and because good blood pressure control is even better at preventing diabetes complications than good blood sugar control, African Americans should aim for a blood pressure of 120/80 or as close to that as possible.

## Medication Safety

The most important key to safe drug use is to tune into your body. If you start a new medicine and suddenly feel bad, don't shrug it off. There's a good chance your new medicine is causing your problems, and you should tell your doctor.

Twenty years ago, when I graduated from pharmacy school, there were few drugs for diabetes, high blood pressure, or high cholesterol. People had to put up with bad side effects. Today, you have many options. If one drug causes you problems, there are others to try.

Other ways to stay safe are:

- Take your drugs exactly as prescribed.
- Don't use other people's medicines.
- Tell your doctor about everything you are taking, including over-the-counter drugs, herbs, supplements, and vitamins. These can cause side effects or interact with your diabetes drugs.
- If you take alternative therapies, never, ever stop your regular diabetes medicines. Diabetes cannot be cured, no matter what you hear or read.

## An Invitation

I invite people with questions about diabetes to visit the Black and Brown Sugar Web site at [www.blackandbrownsugar.com](http://www.blackandbrownsugar.com). This Web site provides information on diabetes in minorities to both health care professionals and consumers. It provides a forum where people can ask questions about diabetes care and offers online group classes and a bulletin board called "Ask the Expert."

## In Conclusion

- Diabetes can be controlled, but you have to take charge of your life. You must eat a healthy and well-balanced diet, exercise daily, take your medicines as prescribed, and work with your doctors, not against them.
- Know your numbers! We know our telephone, social security, and ATM numbers, but we don't know our blood pressure, cholesterol, and HbA1c numbers. It is important that you know what your goal numbers are and work to achieve them.

---

*Lenore Threadgill Coleman, PharmD, CDE, FASHP, a clinical science specialist in the Scientific Affairs Department of Bayer Corporation in West Haven, Conn., is also a clinical pharmacist and diabetes educator at the Diabetes Education and Supply Center located in Los Angeles and an adjunct assistant professor of pharmacy practice at the University of Southern California in Los Angeles.*



PHOTO COURTESY OF LENORE THREADGILL COLEMAN

# Safety Of Drugs For **TYPE 2** DIABETES

## Sulfonylureas

Acetohexamide (Dymelor)  
Chlorpropamide (Diabinese)  
Glyburide (U.S.), Glibenclamide (Europe, Mexico), (DiaBeta, Glynase, Micronase)  
Glimepiride (Amaryl)  
Glipizide (Glucotrol, Glucotrol XL)  
Tolazamide (Tolamide, Tolinase)  
Tolbutamide (Orinase)

### How They Work

Help the pancreas to produce and release more insulin into the bloodstream. For these agents to work, your pancreas has to be making some insulin.

These agents can be used alone or with acarbose, metformin, insulin, or thiazolidinediones.

### Warnings

- May increase the damage to the heart muscle during a heart attack
- People with kidney problems may have more low blood sugar reactions. (See page 58.)
- People over 65 years old may require lower dosages to avoid low blood sugar reactions. (See page 58.)

## Women's Issues

### Pregnancy

Avoid use of these agents during pregnancy; their effects during pregnancy have not been well studied and, in general, they will not adequately control blood sugar levels.

### Labor and delivery

If, however, these agents are taken during pregnancy, discontinue their use at least 4 weeks to 2 days before expected delivery date.

### Lactation

Chlorpropamide and tolbutamide are excreted in breast milk. Because they can potentially cause low blood sugar reactions (see page 58) in breast-fed infants, nursing mothers should avoid their use.

## Side Effects

### Notify your doctor if you get:

- Hypoglycemia (low blood sugar reaction [see page 58])
- Hyperglycemia (high blood sugars)
- Fever
- Rash
- Unusual bruising or bleeding
- Sore throat

## Less serious side effects include:

- Weight gain, constipation, diarrhea, nausea, heartburn, change in appetite, stomach discomfort, dizziness, drowsiness, and headache

## Comments

- Discuss with your doctor whether you can drink alcohol
- May increase sensitivity to sunlight, so wear sunscreen, sunglasses, and a hat outside
- May cause an upset stomach
- May cause a skin rash or itching
- Can cause a low blood sugar reaction (see page 58), so monitor your blood sugar levels regularly (2 times per day)
- Do not take other medicines without your doctor's okay

(Please note: Glucovance, a new combination tablet, contains either 1.25 mg, 2.5 mg, or 5 mg of glyburide plus metformin. The mechanism of action, side effects, warnings, and women's issues would be the same as seen with the sulfonylureas and metformin.)

## Biguanides

Metformin (Glucophage)

### How It Works

Decreases glucose production in the liver and improves the use of glucose in the tissues.

This agent can be used alone or with sulfonylureas, thiazolidinediones, or insulin.

## Warnings

- Lactic acidosis is a rare side effect. The symptoms of lactic acidosis are unexplained hyperventilation, muscle aches, and being sleepy and tired for no reason
- Should not be used in people with kidney problems or liver problems
- Elderly people should use lower dosages; metformin should be avoided in people who are 80 years old or older
- Should be used with caution in people with congestive heart failure or chronic obstructive pulmonary disease

## Women's Issues

### Pregnancy

This agent should be avoided because there are not enough studies in pregnant women.

### Lactation

This agent should not be used during breastfeeding because it is excreted in the breast milk of animals, and there are no human studies.

## Side Effects

### Notify your doctor if:

- You have unexplained weakness, tiredness, dizziness, or trouble breathing
- You drink more than 2–4 alcoholic drinks a week

### Less serious side effects include:

Diarrhea, vomiting, loss of appetite, metallic taste in mouth, upset stomach, and bloating

## Comments

- Has a good effect on weight. Many people lose weight, and when metformin is used with agents that cause weight gain, it decreases that weight gain
- Has a good effect on cholesterol levels
- Drink alcohol sparingly. If you have a history of alcohol abuse, caution is required when using this agent. Check with your physician
- Have kidney function tested before starting and at least yearly while on metformin
- Can cause vitamin B12 deficiency
- Discontinue use before any X-ray study in which contrast agents are injected
- Does not cause low blood sugar reactions (see page 58) when used alone; may cause them when used with insulin or sulfonylureas
- Upset stomach and bloating can be decreased by taking metformin with meals and increasing the dosage slowly

(Please note: Glucovance, a new combination tablet, contains either 250 mg or 500 mg of metformin plus glyburide. The mechanism of action, side effects, warnings, and women's issues would be the same as for metformin and the sulfonylureas.)

## Alpha-glucosidase Inhibitors

Acarbose (Precose)  
Miglitol (Glyset)

## How They Work

Block the enzymes that digest the sugars and starches you eat. This action causes a slower and lower rise of blood sugar throughout the day, but mainly right after meals.

## Warnings

- Caution is needed in people with kidney problems
- Need to monitor liver function, serum calcium levels, and vitamin B6 levels

## Women's Issues

### Pregnancy

These agents should be avoided because there are not enough studies in pregnant women.

### Lactation

These agents should not be used during breastfeeding because they are excreted in the breast milk of animals, and there are no human studies.

## Side Effects

### Less serious side effects include:

Gas, abdominal pain, diarrhea (Side effects usually occur during the first few weeks of therapy and generally diminish over time.)

## Comments

- Have a good effect on weight. Many people lose weight, and when alpha-glucosidase inhibitors are used with agents that cause weight gain, they decrease that weight gain
- Have a good effect on cholesterol levels (acarbose)
- Should be taken with the first bite of the meal
- Upset stomach and bloating can be decreased by taking acarbose or miglitol with meals and increasing the dosage slowly
- Do not cause low blood sugar reactions (see page 58) when used alone. May cause them when used with insulin or sulfonylureas
- If a low blood sugar reaction occurs (see page 58), you need to use glucose, dextrose, or D-glucose to treat symptoms. Table sugar and fruit juices will not work

## Meglitinides

Repaglinide (Prandin)

### How It Works

Helps your pancreas make more insulin right after meals, which lowers blood sugar.

This agent can be used alone or with metformin.

### Warnings

- People with liver problems may experience higher blood levels of repaglinide

## Women's Issues

### Pregnancy

This agent should be avoided because there are not enough studies in pregnant women.

### Lactation

This agent should not be used during breastfeeding because it is excreted in the breast milk of animals, and there are no human studies.

### Side Effects

#### Notify your doctor if you get:

- Chest pain
- Numbness and tingling in the arms or hands
- Dizziness

#### Less serious (or uncommon) side effects include:

Weight gain, low blood sugar reactions (see page 58), and headache

### Comments

- Can cause low blood sugar reactions (see page 58), so monitor your glucose regularly and do not take if you are going to skip a meal
- Should be taken within 15–30 minutes of the meal. If you skip a meal (or add an extra meal) you should skip (or add) a dose for that meal

## Phenylalanine derivatives

Nateglinide (Starlix)

## How It Works

Helps your pancreas make more insulin right after meals, which lowers blood sugar.

This agent can be used alone or with metformin.

### Warnings

- People with liver problems may experience higher blood levels of nateglinide
- Should not be used in people taking sulfonylureas

## Women's Issues

### Pregnancy

This agent should be avoided because there are not enough studies in pregnant women.

### Lactation

This agent should not be used during breastfeeding because it is excreted in the breast milk of animals, and there are no human studies.

### Side Effects

#### Less serious (or uncommon) side effects include:

Weight gain, low blood sugar reactions (see page 58)

### Comments

- Can cause low blood sugar reactions (see page 58), so monitor your glucose regularly and do not take if you are going to skip a meal