



Medicines Used to Treat Type 2 Diabetes

People who have type 2 diabetes may need to take medicine to help lower their blood glucose, in addition to being active & choosing healthy foods. There are six types of oral medicines for diabetes. There are also combination drugs which include two different medicines in one pill. There are three types of injected medicines used in type 2 diabetes, often in combination with oral medicines.

The longer a person has type 2 diabetes, the more effort it takes to control it. It is typical to start on one type of medicine and add a second, third, or fourth type of medicine as time goes on. It is also typical for people with type 2 diabetes to eventually need insulin.

Oral Medicines

1. Sulfonylureas stimulate the pancreas to make more insulin.

Possible side effects include low blood sugar, weight gain, upset stomach, skin rash, & itching.

Generic & Brand Names	Dose Range	Special Instructions
Glyburide <ul style="list-style-type: none">DiabetaMicronaseGlynase PresTab	1.25-20 mg/day in 1 or 2 doses 0.75-12 mg/day	
Glipizide <ul style="list-style-type: none">Glucotrol Glipizide extended release <ul style="list-style-type: none">Glucotrol XL	2.5-40 mg/day in 1 or 2 doses 2.5-20 mg/day in 1 dose	Non-extended release should be taken on an empty stomach. Extended release & XL should be swallowed whole and may be taken with or without food.
Glimepiride <ul style="list-style-type: none">Amaryl	1-8 mg/day in 1 dose	Take with the first meal of the day, unless told otherwise.

2. Biguanides decrease the amount of sugar made by the liver.

Possible side effects include diarrhea, nausea, upset stomach, metallic taste in mouth, & weight loss. Metformin can occasionally cause a serious condition called lactic acidosis. Symptoms of lactic acidosis are: nausea, abdominal pain, muscle pains, weak, dizzy, tired, & trouble breathing. Call your doctor right away if you have these symptoms.

Generic & Brand Names	Dose Range	Special Instructions
Metformin <ul style="list-style-type: none"> • Glucophage • Riomet (cherry-flavored liquid) 	500-2550 mg/day in 1, 2 or 3 doses	Take with a meal. Limit your intake of alcohol (it increases your risk of getting lactic acidosis). Stop taking metformin the day of surgery or a medical test which uses dye. Wait 2 days before re-starting it. Your provider will check your kidney function (with a blood test) regularly while you are taking this drug.
Metformin extended-release <ul style="list-style-type: none"> • Glucophage XR • Fortamet • Glumetza 	500-2000 mg/day in 1 dose with largest meal. Do not split extended release pills.	

3. Thiazolidinediones make your body more sensitive to insulin.

They are not used in people who have active liver disease or those who have had congestive heart failure. Possible side effects include liver problems, weight gain, swelling of the feet and legs, a cough or a cold, headache, inflammation of the sinuses and back pain. Pregnancy can occur in women who had stopped ovulating. These medicines stimulate ovulation and make birth control pills less effective.

Avandia can cause or worsen heart failure. If you have severe heart failure (very poor pumping ability of the heart), you cannot be started on Avandia. Avandia is not recommended if you have heart failure with symptoms (such as shortness of breath or swelling), even if these symptoms are not severe. Avandia may increase your risk of a heart attack. This risk may be higher in people who are also taking insulin. Taking Avandia with insulin is not recommended.

Generic & Brand Names	Dose Range	Special Instructions
Rosiglitazone <ul style="list-style-type: none"> • Avandia 	2-8 mg/day in 1 or 2 doses	Your provider will check your liver function (with a blood test) before you start the drug and periodically afterwards.
Pioglitazone <ul style="list-style-type: none"> • Actos 	15-45 mg/day in 1 dose	Same as above.

4. Meglitinides help the pancreas make more insulin, especially after meals. Possible side effects include low blood glucose & weight gain.

Generic & Brand Names	Dose Range	Special Instructions
Repaglinide • Prandin	0.5-16 mg/day in 1, 2 or 3 doses	Take from $\frac{1}{2}$ hr to just before a meal. Don't take it if you don't eat. Prandin interacts with Gemfibrozil (Lopid) which is used to lower triglycerides and raise HDL cholesterol. Prandin levels are higher when a person also takes Gemfibrozil. Talk with your provider if you are on both medicines or are on one and the other is prescribed.
Nateglinide • Starlix	60-120 mg with each meal	Take from $\frac{1}{2}$ hr to just before a meal. Don't take it if you don't eat.

5. Alpha-glucosidase inhibitors slow the absorption of starches.

Possible side effects include bloating, diarrhea, and gas.

Generic & Brand Names	Dose Range	Special Instructions
Acarbose • Precose	25-100 mg with each meal	Take with the first bite of a meal. Treat low blood glucose with glucose tablets or low fat milk.
Miglitol • Glyset	25-100 mg with each meal	Take with the first bite of a meal. Treat low blood glucose with glucose tablets or low fat milk.

6. DPP-4 Inhibitors help improve the amount of insulin produced by your body after a meal and decrease the amount of sugar made by your body. Possible side effects include an upper respiratory infection, stuffy or runny nose, sore throat, headache, urinary tract infection, and skin conditions.

Generic & Brand Names	Dose Range	Special Instructions
Sitagliptin • Januvia	25-100 mg in 1 dose a day	Take with or without food.
Saxagliptin • Onglyza	2.5–5 mg in 1 dose a day	Take with or without food.

Combination Pills (a pill that contain 2 types of medicine in 1 pill)

Generic & Brand Names	Dose Range	Special Instructions
• <i>Glucovance</i>	1.25/250-20/2000 mg/day in 1 or 2 doses with meals	See information on <i>Glyburide & Metformin</i> on pages 1 & 2.
• <i>Avandamet*</i>	1/500-8/2000 mg/day in 1 or 2 doses with meals	See information on <i>Avandia & Metformin</i> on page 2.
• <i>Metaglip</i>	2.5/250 - 10/2000 mg/day in 1 or 2 doses with meals	See information on <i>Metformin & Glipizide</i> on pages 1 & 2.
• <i>ActoPlus Met</i>	15/500-45/2550 mg/day in 1 or 2 doses with meals	See page 2 for information on <i>Actos & Metformin</i> .
• <i>Avandaryl*</i>	4/1–8/4 mg/day in 1 dose	See information on <i>Avandia & Amaryl</i> on pages 1 & 2.
• <i>Duetact</i>	30/2–30/4 mg/day in 1 dose.	See information on <i>Glimepiride & Actos</i> on pages 1 & 2.
• <i>Janumet</i>	100/1000–100/2000, twice daily with meals	See information on <i>Januvia & Metformin</i> on pages 2 & 3.
• <i>Kombiglyze XR</i>	2.5/1000, 5/500, 5/1000 or 5/2000 taken once daily with the evening meal.	See information on <i>Saxagliptin and Metformin ER</i> on pages 2 & 3.

**Avandamet* and *Avandaryl* can cause or worsen heart failure. If you have severe heart failure (very poor pumping ability of the heart), you cannot be started on *Avandamet* or *Avandaryl*. These medicines are also not recommended if you have heart failure with symptoms (such as shortness of breath or swelling), even if these symptoms are not severe.

Avandamet and *Avandaryl* may increase your risk of a heart attack. This risk may be higher in people who are also taking insulin. Taking *Avandamet* or *Avandaryl* with insulin is not recommended.

Call your doctor right away or go to the nearest hospital emergency room if you have chest pain, a feeling of chest pressure or discomfort, pain in the arm, back, neck, jaw or stomach, shortness of breath and you think you are having a heart attack. Tell your doctor right away if you: have swollen legs or ankles, a rapid increase in weight or difficulty breathing, or unusual tiredness.

Injected Medicines

1. Insulin is a hormone which lowers blood glucose by moving glucose from the bloodstream into the body's cells. Insulin comes in many types and forms. People with type 2 diabetes may inject insulin from one to four times daily, depending on their diabetes and lifestyle. They may take both insulin and some types of oral diabetes medicines. More information on insulin can be found in our handout entitled, *Insulin Preparations*.

2. Incretin mimetics stimulate insulin secretion when the blood glucose is high, prevent the body from releasing too much glucagon, and slow emptying of the stomach. They are used in combination with either sulfonylureas (see page 1), metformin (see page 2) or both. Possible side effects include: loss of appetite, nausea, vomiting, diarrhea, dizziness, feeling "jittery", headache, low blood sugar & weight loss. Lirglutide has been shown to increase thyroid cancer in rats and mice. Report any change in the following to your doctor: lump in your neck, difficulty swallowing, shortness of breath, or persistent hoarseness.

Some people who take these medicines have had a serious condition called pancreatitis. If you have severe, persistent abdominal pain, with or without nausea and vomiting, contact your doctor and stop taking this medicine until you talk to him or her. You are at higher risk for pancreatitis if you have gallstones, very high triglycerides (a type of blood fat) or are a heavy alcohol user.

Generic & Brand Names	Dose Range	Special Instructions
Exenatide • Byetta	5 mcg twice a day for the first month, then 10 mcg twice a day.	Take up to 60 minutes before breakfast & dinner (or 2 meals which are at least 6 hours apart). Do not take after the meal. Keep open pen at room temperature and unopened pens in refrigerator. Discard pen after 30 days. If you are also taking birth control pills or antibiotics, take them at least 1 hour before taking Byetta.
Lirglutide • Victoza	.6 mg once daily for a week, then 1.2 mg once daily. Dose can be increased to 1.8 mg if needed.	Does not have to be given with a meal. Keep open pen at room temperature and unopened pens in refrigerator. Discard pen after 30 days of use, even if pen is not empty.

3. Pramlintide is a synthetic copy of the human hormone, amylin, which is only used in combination with insulin therapy. Amylin, a hormone normally made by the pancreas, slows stomach emptying, suppresses glucagon secretion and stimulates feeling "full" after eating. Possible side effects of Pramlintide include: nausea, vomiting, & hypoglycemia. It may affect how oral medicines are absorbed.

Generic & Brand Names	Dose Range	Special Instructions
Pramlintide • Symlin	Starting dose: 60 μg given just before meals of at least 250 calories or 30 grams of carb. After 3 days on this dose with no nausea, the dose is increased to 120 μg .	Inject in abdomen or thigh. Do not give within 2" of an insulin injection site. Pre meal insulin dose must be cut in half.