

Non-Insulin Medications for Diabetes

Just as there are different types of diabetes, there are also different ways to treat diabetes. People with type 1 diabetes (or who are “insulin dependent”) take insulin. Others—mostly people with type 2 diabetes—are prescribed oral medication by their provider.

We will briefly introduce some of the common oral medications for diabetes here.

There are also several different categories (also called classes) of medications. Each class acts in a different way to lower blood sugar levels within the body and often have different side effects.

1. Biguanides:

- The medicine **Glucophage**[®] (metformin) belongs to this class of medications.
- It tells your liver to produce less sugar. It also helps the insulin in your body take sugar out of your bloodstream, and put the sugar into your body cells (this helps your muscles use the sugar as an energy source).
- Possible side effects: Nausea, bloating, diarrhea, B12 deficiency.
- Benefits: Can lower cholesterol, does not cause blood sugars to drop too quickly, no weight gain, approved for people ages 10 years and older, generally low cost.

2. Sulfonylureas:

- The medicines that fall into this category or class are **Glucotrol**[®] (glipizide), **Micronase**[®] (glyburide), and **Amaryl**[®] (glimepiride).
- These medicines encourage your pancreas to produce a longer, slower release of insulin.
- Possible side effects: Low blood sugar (hypoglycemia) and weight gain.
- Benefits: These can lower blood sugars more quickly than other medications, and are usually low in cost.

3. SGLT2 Inhibitors:

- Examples of the medicines that are in this category or class are **Invokana**[®] (canagliflozin), **Farxiga**[®] (dapagliflozin), **Jardiance**[®] (empagliflozin), and **Steglatro**[®] (ertugliflozin).
- These medicines make your kidneys reabsorb less sugar. Instead, the sugar goes into your urine and leaves your body when you urinate, which means there is less sugar building up in your bloodstream.
- Possible side effects: Can cause low blood pressure and ketoacidosis, and can increase the risk of UTIs and yeast infections (often in women).

- Benefits: Reduces the risk of cardiovascular death and heart failure, and protects against damage to the kidneys from diabetes. Does not cause hypoglycemia (low blood sugar) or weight gain.

4. DPP-4 Inhibitors:

- This category includes medicines such as **Januvia**[®] (sitagliptin), **Onglyza**[®] (saxagliptin), **Tradjenta**[®] (linagliptin), and **Nesina**[®] (alogliptin).
- These medications make the group of hormones called Incretins in your body more important. They act to increase the insulin release from your pancreas, and help your stomach hold on to food longer, which makes you feel full with less food.
- Possible side effects: Headache, flu-like symptoms, severe and disabling joint pain, and pancreatitis. Saxagliptin and alogliptin can increase risk of heart failure (monitor for signs of swelling, weakness, and shortness of breath).
- Benefits: No hypoglycemia or weight gain.

5. Thiazolidinediones (TZDs):

- Examples of this category of medication are **Actos**[®] (pioglitazone) and **Avandia**[®] (rosiglitazone).
- These medications will increase your body's capability to use insulin that is released by your pancreas.
- Possible side effects: Weight gain and swelling. People who have a history of heart failure should not take these medications.

6. GLP-1 Agonists:

- This category of medicines includes **Byetta**[®] (exenatide), **Victoza**[®] (liraglutide), **Adlyxin**[®] (lixisenatide), **Bydureon**[®] (exenatide), **Trulicity**[®] (dulaglutide), and **Ozempic**[®] (semaglutide).
- Mimics a group of hormones called Incretin, which tells your pancreas to increase the release of insulin with meals, helps your stomach to hold on to food longer (promotes satiety), and suppresses glucagon (a hormone that increases blood sugar level in your blood).
- Possible side effects: Nausea, vomiting, injection site reaction, acute pancreatitis, Thyroid C-cell tumor with some of the GLP-1 Agonists, avoid taking this medicine if you have a family history of medullary thyroid tumor.
- Benefits: Weight loss, significantly reduces the risk of cardiovascular death, heart attack, and stroke.

7. Alpha-Glucosidase Inhibitors:

- **Precose**[®] (acarbose) and **Glyset**[®] (miglitol).
- These work by slowing down the digestion of carbohydrates (sugars) after eating meals.

- Possible side effects: Bloating, gas, diarrhea, and can cause hypoglycemia.

8. Meglitinides:

- **Prandin**[®] (repaglinide) and **Starlix**[®] (nateglinide).
- They encourage rapid insulin burst by your pancreas.
- Possible side effects: Weight gain, hypoglycemia. Always take before meals.

9. Amylin Mimetics:

- One kind of Amylin Agonist is called **Symlin**[®] (pramlintide) and is rarely prescribed. It's injected like insulin.
 - i. Symlin slows digestion, which keeps blood sugars from rising too fast.
 - ii. Symlin also lowers the amount of sugar produced by the liver.
 - iii. Symlin can trigger a feeling of fullness after meals, which helps control the appetite.
- They help your stomach to hold on to food longer, and they suppress Glucagon.
- Possible side effects: Nausea, severe risk for hypoglycemia.
- Benefits: Weight loss, decreased use of insulin (if on insulin treatment already), can be used for persons with Diabetes Type 1 too.

10. Combination Oral Medications:

- Some of the oral medications come in combinations, meaning two different types of medications are put into one pill. The good part about this is that you are taking less pills. The bad part about this is that sometimes the combination pills may cost more. Examples:
 - i. **Trijardy XR**[®] (empagliflozin, linagliptin, and metformin XR).
 - ii. **Duetact**[®] (pioglitazone/ glimepiride).
 - iii. **Invokamet**[®] (canagliflozin/ metformin).