



DPP-4 Inhibitors: Incretin-Based Medicine **for** Type 2 Diabetes

WHAT IS TYPE 2 DIABETES?

When you have type 2 diabetes, your blood glucose (sugar) levels are higher than normal. The glucose in your blood comes mainly from the food you eat, and a small amount comes from your liver. It's normal for glucose levels to rise after a meal. But with diabetes, levels can go too high.

Your body uses glucose for energy with the help of insulin, a hormone made by your pancreas. You can develop type 2 diabetes when your body

- Doesn't make enough insulin
- Doesn't use insulin the way it should

Middle-aged and older people are more likely to develop type 2 diabetes. Being overweight and inactive can also increase your risk for type 2 diabetes.

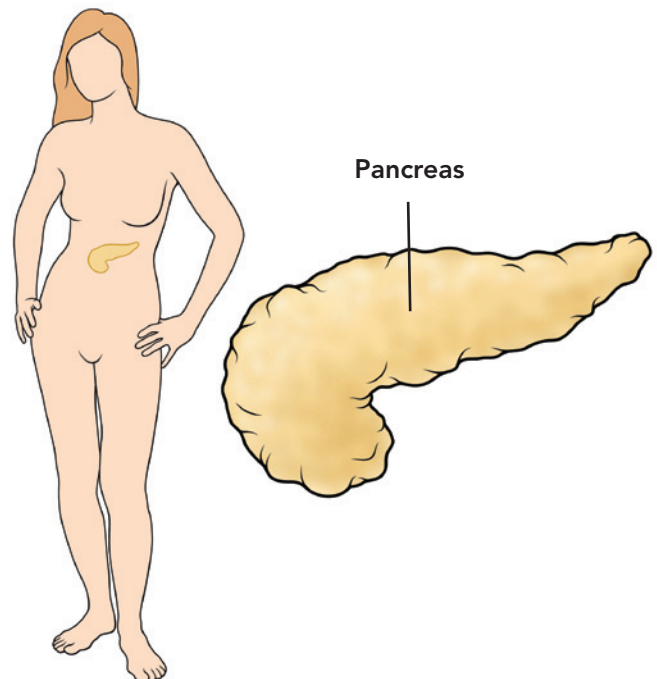
High blood glucose levels over time can lead to serious health problems, such as eye and nerve damage, kidney disease, heart attacks, and strokes. But you can prevent or delay health problems by keeping your blood glucose, blood pressure, and cholesterol levels on target. Meal planning, exercise, and medicines (if needed) can help you stay healthy.

DID YOU KNOW?

Another type of incretin-based medicine, called a GLP-1 receptor agonist, works in a slightly different way to achieve the same effect on blood glucose levels.

WHAT IS INCRETIN-BASED MEDICINE?

Incretin-based medicine is a type of medicine for type 2 diabetes. This kind of medicine is based on the action of hormones called incretins, which help control how the pancreas works. GLP-1 incretins cause your pancreas to produce more insulin after you eat, helping your body use glucose. The effects of GLP-1 only last a few minutes, however. An enzyme (a substance that causes a chemical reaction in your body) called DPP-4 quickly breaks down GLP-1 in the blood.



WHAT ARE DPP-4 INHIBITOR MEDICINES?

DPP-4 inhibitor medicines (generic names: sitagliptin saxagliptin, and linagliptin) are a type of incretin-based medicine that blocks the action of the DPP-4 enzyme. This makes GLP-1 last longer and increases the amount of GLP-1 in your blood. More GLP-1 means less glucose build-up in the blood.

DPP-4 inhibitors come in pill form and are taken by mouth. They are used alone or in combination with other diabetes medicines. They are also available in combination pills. Some pills contain a DPP-4 inhibitor plus another type of diabetes medicine. Your dose of sitagliptin or saxagliptin (but not linagliptin) may need to be adjusted if you have kidney problems.

WHAT ARE THE BENEFITS OF DPP-4 INHIBITORS?

They help keep your blood glucose from going too high by

- Increasing the insulin produced by your pancreas, especially right after you eat a meal
- Decreasing glucagon, a hormone that releases glucose from your liver

WHAT ARE THE SIDE EFFECTS AND DISADVANTAGES OF DPP-4 INHIBITORS?

DPP-4 inhibitors don't cause low blood glucose, a condition called hypoglycemia. But you're at risk for low blood glucose if you also take diabetes pills or insulin that can cause hypoglycemia. Low blood glucose can make you feel hungry, dizzy, nervous, shaky, or confused. You can learn what to eat or drink to bring your blood glucose level back up to normal.

DPP-4 inhibitors can cause a runny nose, sore throat, headache, or diarrhea. They may also cause inflammation of your pancreas, skin rash, hives, swelling of your face, or trouble breathing. Ask your doctor which signs to watch for and what to do if those signs happen.

HOW WILL I KNOW WHICH DIABETES MEDICINES ARE BEST FOR ME?

Talk with your doctor about your diabetes medicines. Ask about whether there are other medicines that can help you. Tell your doctor about any side effects you have from your medicines. Be sure to tell your doctor about your other health conditions and whether you're pregnant or planning to become pregnant. Then your doctor can make the best choice of medicine for you.

EDITORS

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The Hormone Health Network offers free, online resources based on the most advanced clinical and scientific knowledge from The Endocrine Society (www.endo-society.org). The Network's goal is to move patients from educated to engaged, from informed to active partners in their health care. This fact sheet is also available in Spanish at www.hormone.org/Spanish.

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Questions to ask your doctor

- What else can I do to keep my blood glucose levels under control?
- How often should I have check-ups?
- What side effects can happen with my medicines?
- What should I do if I forget to take my diabetes medicine?
- Should I see a diabetes educator?
- Should I see an endocrinologist for my diabetes care?

RESOURCES

- Find-an-Endocrinologist: www.hormone.org or call 1-800-HORMONE (1-800-467-6663)
- Find a diabetes educator (American Association of Diabetes Educators): www.diabeteseducator.org/DiabetesEducation/Find.html
- Hormone Health Network information about diabetes: www.hormone.org/diabetes
- National Institutes of Health:
 - National Diabetes Information Clearinghouse: www.diabetes.niddk.gov or call 1-800-860-8747
 - National Diabetes Education Program: ndep.nih.gov
 - MedlinePlus (about diabetes): www.nlm.nih.gov/medlineplus/diabetes.html
 - MedlinePlus (about medicines): www.nlm.nih.gov/medlineplus/druginformation.html
- The American Diabetes Association: www.diabetes.org or call 1-800-DIABETES (800-342-2383)



www.hormone.org