

### Diabetes Drug Summary

Drug	Mechanism	Benefits	Side Effects	Rating
Actos (pioglitazone)	Affects PPAR-gamma receptor Grows new fat cells that take up glucose.	Reduces insulin resistance.	From Prescribing Information: "In postmarketing experience with ACTOS, cases of congestive heart failure have been reported in patients both with and without previously known heart disease....In postmarketing experience with ACTOS, reports of hepatitis and of hepatic enzyme elevations to 3 or more times the upper limit of normal have been received. Very rarely, these reports have involved hepatic failure with and without fatal outcome. Macular edema. Weight gain. Ovulation in premenopausal women. Raises LDL.	-----
Amaryl (glimepiride), Glyburide, (Glucovance is glyburide with added metformin) Glucator, Diabeta (glipizide)	Sulfonylurea. Stimulates beta cell to secrete insulin for 8 - 12 hours whether or not glucose is present in bloodstream	Raises insulin level.	Stimulate receptors on heart tissue leading to higher rate of heart attacks	---
Avandia, (rosiglitazone) Avandamet (Avandamet is Avandia combined with metformin)	Affects PPAR-gamma receptor Grows new fat cells that take up glucose.	Reduces insulin resistance.	66% more heart attacks. Causes water retention. Causes weight gain. Causes heart failure. Causes osteoporosis. Causes macular edema.	-----
Byetta (exenatide) Bydureon is a long-lasting version of Byetta	Synthetic GLP-1	Slows stomach emptying, which can lead to weight loss. Stimulates insulin secretion in intact beta cells. Very effective for 1/3 of those who take it, occasionally producing dramatic weight loss.	Causes growth of abnormal alpha and beta cells in pancreas growing a huge mass of abnormal cells that is associated with the growth of precancerous pancreatic adenomas (tumors). Vomiting. Nausea. Chills. Headache. Weakness. Blood pressure fluctuations. Tooth pain. Constipation. Nasal congestion. Doubles risk of pancreatitis.	----
Diamicron (gliclazide)--not sold in U.S.	Sulfonylurea. Stimulates beta cell to secrete insulin for 8 - 12 hours whether or not glucose is present in bloodstream. The only sulfonylurea that does not increase the risk of heart attack death	Raises insulin level.	Can cause hypos. Causes hunger and weight gain May cause reversible beta cell burnout with prolonged use. Least heart attack risk of this class of drugs.	+
Forxiga/Farxiga/Xigduo (Xigduo is Foxiga and metformin)	SGLT-2 inhibitor, stops kidney from reabsorbing glucose and causes more glucose excretion, but also raises glucose production by raising glucagon	Lowers fasting glucose and A1c modestly when taken alone, has no additional impact when combined with metformin	Probably the same as Invokana, above, but few robust studies have been done on it as few people use it.	----
Invokana/Invokamet (Invokamet is Invokana plus metformin)	First SGLT-2 inhibitor drug, stops kidney from reabsorbing glucose and causes more glucose excretion, but also raises glucose production by raising glucagon.	Lowers fasting glucose and A1c modestly when taken alone, has no additional impact when combined with metformin.	Increases stroke and heart attack when started, may cause lactic acidosis in people with Type 2 diabetes. Raises risk of foot amputations. may cause dangerously low blood pressure, low potassium. May raise risk of liver damage, breast and bladder cancers. Causes vaginal and penile yeast infections. Claims it stops kidney failure in people with severe diabetic kidney disease should be taken with caution as the same study also found an increase in amputations and other severe side effects.	----

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Januvia (sitagliptin) Janumet is Januvia combined with metformin	Inhibits the DPP-4 protease allowing GLP-1 and GIP levels to rise and stimulate insulin secretion and decrease glucagon production.	Stimulates insulin secretion in intact beta cells.	Label warns it may cause pancreatitis, acute renal (kidney) failure, and severe allergic reactions including severe skin rashes. Research found it doubles risk of pancreatitis. Causes strikingly abnormal cell overgrowth in the pancreas and microadenomas (benign glandular tumors that can become cancerous) and neuroendocrine tumors. Cold symptoms, inflamed sinuses, raised blood pressure, constipation. Elevated leucocyte count. DPP-4 inhibition has been called "trigger for prostate cancer", also associated with metastasis in ovarian and lung cancers and melanoma.	----
Jardiance	SGLT-2 inhibitor, stops kidney from reabsorbing glucose and causes more glucose excretion, but also raises glucose production by raising glucagon	Lowers fasting glucose and A1c modestly when taken alone, has no additional impact when combined with metformin	Probably the same as Invokana, above. Data reveal that company claims it reduces heart attacks only apply to people with heart failure or previous heart attacks. Outcomes for others were unimpressive.	
Metformin, Metformin ER	Keeps liver from dumping glucose. Makes muscles take up glucose.	Reduces insulin resistance and lowers triglycerides. Appears to protect against breast cancer and lower risk of other cancers. Protects heart during heart attack and may prevent heart attack.	Gas, abdominal pain, diarrhea. May cause Vitamin-B12 deficiency with long use. Fewer side effects with ER/XR extended release form. Fear it causes lactic acidosis is not supported by high quality research.	+++++
Onglyza (saxagliptin), Trajenta (linagliptin) Kombiglyze is Onglyza combined with metformin. Jentadueto is Trajenta and Metformin	Inhibits the DPP-4 protease allowing GLP-1 and GIP levels to rise and stimulate insulin secretion and decrease glucagon production.	Stimulates insulin secretion in intact beta cells.	Label warns these drugs may cause acute pancreatitis, severe allergic reactions. Research found it doubles risk of pancreatitis. Very likely to cause strikingly abnormal cell growth in pancreas and microadenomas (benign glandular tumors that can become cancerous) and neuroendocrine tumors as this appears to be a class effect found in all incretin drugs. Commonly causes cold symptoms, inflamed sinuses, raised blood pressure, constipation. Lowers lymphocytes, sometimes dangerously. <b>Concentration rises with grapefruit juice, ketoconazole, erythromycin, and verapamil. Raises peak concentrations of sulfonylureas, Actos and Avandia causing hypos.</b> DPP-4 inhibition has been called "trigger for prostate cancer", also associated with metastasis in ovarian and lung cancers and melanoma.	----
Prandin (repaglinide)	Meglitinide. Stimulates beta cell to secrete insulin for 1-3 hours whether or not glucose is present in bloodstream	Stimulates insulin secretion for 1-3 hours. The most heart-safe insulin stimulating drug available in the U.S..	Can cause hypos. Same dose much more powerful when combined with metformin. Causes weight gain. Changes concentration of many other drugs including birth control pills in the bloodstream. May cause upper respiratory infection, back pain, flu symptoms, dizziness, joint problems. Generic versions may be much slower than the brand name version.	neutral
Precose (acarbose)	Blocks alpha glucosidase enzyme used to break down starches and complex sugars	Slows the digestion of carbs so that second phase insulin can deal with them.	Gas	+++
Starlix (natalinide)	Meglitinide. Stimulates beta cell to secrete insulin for 1-3 hours whether	Raises insulin level for a short time. Inhibits DPP-4 briefly.	Can cause hypos. Causes weight gain, upper respiratory infection, back pain, flu symptoms, dizziness, joint problems.	-

	or not glucose is present in bloodstream			
Victoza	Synthetic GLP-1	Slows stomach emptying, which can lead to weight loss. Stimulates insulin secretion in intact beta cells. Less effective than Byetta but causes far more side effects than Byetta.	Label contains Black Box warning "Liraglutide injection may increase the risk that you will develop tumors of the thyroid gland, including medullary thyroid carcinoma (MTC; a type of thyroid cancer), which may cause death if it is not treated at an early stage." Likely to also cause the abnormal cell overgrowth associated with all incretin drugs that leads to the growth of precancerous adenomas (tumors).May cause renal [kidney] impairment. Study shows it causes more serious rashes than Byetta. Vomiting. Nausea. Chills. Headache. Weakness. Blood pressure fluctuations. Tooth pain. Constipation. Nasal congestion. Doubles risk of pancreatitis.	----