



Medications for Type 2 Diabetes

People with type 2 diabetes may need tablets to help maintain their blood glucose levels within their target range. Tablets are to be taken in conjunction with a healthy eating plan and regular physical activity. Tablets are not a substitute for healthy eating and physical activity.

Your regular blood glucose monitoring enables you to see if the medications and lifestyle changes are achieving your target range for blood glucose levels.

Diabetes Tablets

There are six classes (types) of tablets currently used in Australia for lowering blood glucose levels.

Alpha Glycosidase Inhibitor

Chemical Name	Brand Name	Duration of Action	Tablet size
Acarbose	Glucobay	2 hours	100mg

These help to slow down the digestion of certain dietary carbohydrates in the gut (intestine). They do not, on their own, cause hypoglycaemia (low blood glucose level/hypo).

However, when taken in combination with a Sulphonylurea, Acarbose can enhance the risk of hypoglycaemia. If hypoglycaemia is being experienced then it must be treated with pure glucose (Carbotest, Lucozade, glucose tablets, glucose gel) as sucrose (sugar) will be delayed in absorption.

Side effects include flatulence (gas), bloating and diarrhoea.

This medication needs to be started at low doses and increased slowly to minimise the side effects. Maximum dose 200mg 3x/day.

Tablets should be taken just before eating. Because of weak action and side effects, rarely used now.

Biguanides

Chemical Name	Brand Name	Duration of Action	Tablet size
Metformin	Diabex Glucophage Diaformin Glucomet Novomet Glucohexal	12 hours	500mg or 850mg or 1000mg (1Gm)
	Diabex XR	24 hours	500mg 1000mg (1 Gm)
	Diaformin XR		500mg

These help insulin to work better by lowering insulin resistance. Metformin mostly makes the liver more responsive to insulin and controlling the liver's release of glucose. Metformin improves the uptake of glucose by the muscles. Metformin slows gastric absorption.

Side effects can include nausea, heartburn, upset stomach and a metallic taste in the mouth. This can be reduced by taking it with or after food, not on an empty stomach.

Diarrhoea can be catastrophic. If diarrhoea occurs then you must contact your doctor to cease the medication. Once the diarrhoea has settled sometimes it can be slowly restarted with no further problems.

This medication needs to be started at low doses and increased slowly to minimise the side effects. Maximum dose 2000 mg (2Gm) /day.

This medication can have a mild appetite suppressant effect.

This medication should not be used if there is severe liver, kidney or heart disease present and should not be taken at the time of surgery or x-ray procedures with dye contrast.

It may take a week or more to achieve full effect of medication.

Diabex XR/Diaformin XR must be taken with your evening meal to be effective over 24 hours.

Main side effect is weight gain.

Others may include, skin rashes, gastric upsets and jaundice.

Maximum dose is 3 tablets/day exception Glimepiride 12mg/day.

Diamicron MR 60mg tablets can be broken in half if the dose required is 30mg; maximum dose is 2 tablets/day.

Sulphonylureas

Chemical Name	Brand Name	Duration of Action	Tablet Size
Gliclazide	Diamicron MR Glyade Glyade MR	18- 24 hours	60mg 80mg 30mg
Glibenclamide	Daonil Glimel	18-24 hours	5mg
Glipizide	Minidiab Melizide	6-12 hours	5mg
Glimepiride	Amaryl Diapride Dimirel	18-24 hours	1mg or 2mg or 3mg or 4mg

These tablets lower blood glucose levels by stimulating the pancreas to release more insulin.

Tablets should be taken with a meal containing carbohydrates.

Can cause low blood glucose levels (hypoglycaemia). The risk can be reduced by eating regular meals with carbohydrate and planning physical activity.

If taken in combination with Acarbose and hypoglycaemia is being experienced then it must be treated with pure glucose (Carbotest, Lucozade, glucose tablets, glucose gel) as sucrose (sugar) will be delayed in absorption.

Meglitinides

	Brand Name	Duration of Action	Tablet size
Repaglinide	Novonorm	5 hours	0.5mg or 1mg or 2mg

Stimulate the pancreas to release more insulin.

Tablet is taken before each meal, if you are not eating, then don't take the tablet.

Can cause low blood glucose levels (hypoglycaemia).

Side effects other than a low blood glucose level are unusual but include blurred vision; gastrointestinal upset e.g. constipation, diarrhoea and nausea.

Maximum dose is 16mg/day.

Glitazones (Thiazolidinediones)

Chemical Name	Brand Name	Duration of Action	Table size
Rosiglitazone	Avandia	Some days	4mg or 8mg
Pioglitazone	Actos	Some days	15mg

These tablets help to lower blood glucose levels by increasing the effect of insulin by lowering insulin resistance.

Their effect is slow in onset - over days to weeks, and it may take one or two months to have full effect. They work well with Sulphonylureas and Biguanides. Actos also works well with insulin.

They do not cause low blood glucose levels on their own, but low blood glucose levels can occur when they are combined with a Sulphonylurea or insulin. This may happen some weeks after starting Glitazones

They can be taken once or twice daily at any convenient time, they do not have to be taken with a meal.

Maximum dose Actos as only diabetes tablet 45mg/day, in combination with other diabetes tablets 30mg/day.

Maximum dose Avandia 8mg/day.

Side effects include weight gain and fluid retention and they should generally be avoided in people with severe heart disease and heart failure.

Although these tablets have not been reported to cause liver disease, a closely related tablet did cause rare but severe liver damage. Until more information is available it is advised that regular checks of liver function by a blood test should be made after starting on Glitazones.

Avandia must not be taken if:

- You have heart failure or have had heart failure in the past.

- You are being treated for angina or have had a heart attack.

- You are on or commence insulin.

GLP-1 Analogues/DPP-4 Inhibitors

This class of medication has not been approved for use with insulin

Incretin is the messenger that is sent to the pancreas to release an appropriate amount of insulin to absorb the glucose from the food eaten. With type 2 diabetes either there is not enough incretin hormones or it is being blocked.

There are two classes of these medications. The first are the GLP 1 mimetics which are injected medications which give more of an incretin response eg. Exenatide (Byetta).

The second group are oral medications called DPP-4 inhibitors which block the breakdown of incretin therefore making incretin more available eg. Sitagliptin (Januvia), Vildagliptin (Galvus) and Saxagliptin (Onglyza).

Chemical Name	Brand Name	Duration of Action	Tablet/injection size
Exenatide	Byetta (injection)	12 hours	5 micrograms pen or 10 micrograms pen
Sitagliptin	Januvia	24 hours	25mg or 50mg or 100mg
Vildagliptin	Galvus	24 hours	50mg
Saxagliptin	Onglyza	24 hours	5mg

Background information: the hormone, called incretin, is found in the small intestine and is triggered when food is put into the mouth. Once it is triggered it stimulates the pancreas to release an appropriate amount of insulin.

Byetta

Byetta is called an incretin mimetic. It gives more of an incretin response and more of an appropriate release of insulin. Byetta is an injected medication.

Byetta can slow down the emptying of food from the stomach.

The start dose is 5 micrograms for one month. This is to allow the body to adapt to the side effects.

Main side effect nausea, by introducing Byetta slowly with a dose of 5 micrograms twice a day this will allow the body to adjust and overcome the nausea. The 10 micrograms is the treatment dose. Maximum dose is 10 micrograms twice/day.

Some people may experience weight loss.

Because Byetta can slow down the emptying of the stomach, this may affect other medications that need to pass through the stomach quickly. It is very important, to discuss when to take other medications with your doctor and chemist or what medications to avoid.

Care should be taken before commencing Byetta if the following have been experienced:

- Kidney problems
- Heart failure
- High blood pressure or other heart problems
- High cholesterol or triglycerides
- Pancreatitis
- Gall stones
- Alcohol abuse

Do not use Byetta injection if there are visible solid particles or the solution is cloudy or coloured.

Do not use if Byetta has been frozen.

Return Byetta to fridge after each injection, discard pen after 30 days even if there is still solution left in the pen.

Byetta is given within 15 - 60 minutes before eating, twice a day, i.e. before breakfast and before the evening meal (at least 6 hours apart) and not to be given after eating.

Januvia

Januvia reduces the blockers (DPP-4) affect on the release of incretin so that more incretin is available.

The start dose is 100mg daily, if there is moderate kidney failure then the start dose is 50mg daily and if there is severe kidney failure then the start dose is 25mg.

Januvia is given once daily with or without food

Januvia side effects are mainly runny nose, sore throat, cough, sore back of the nose and discomfort with swallowing.

Headache

Maximum dose is 100mg daily or 50 mg daily for moderate kidney damage or 25mg for severe kidney damage.

Galvus

Galvus reduces the blockers (DPP-4) affect on the release of incretin so that more incretin is available.

- The start dose is 50 mg daily alone or when taken with a Sulphonylurea
- Galvus is given 50mg daily or twice daily if using in combination with Metformin or glitazones
- Galvus side effects are mainly dizziness, if experienced should avoid driving. Or
- When used with Metformin headache and tremor
- When used with Sulphonylurea headache, tremor and weakness
- When used with Glitazone weight gain and leg swelling
- Galvus is not recommended for use in people with moderate to severe renal failure or liver dysfunction

Onglyza

Onglyza reduces the blockers (DPP-4) affect on the release of incretin so that more incretin is available.

- The dose is 5 mg once daily, with or without food.
- Onglyza side effects are mainly upper respiratory tract infection, urinary tract infection, and headache. Or
When used with Metformin headache or runny nose, sore throat, cough, sore back of the nose and discomfort with swallowing.
- Onglyza is not recommended for use in people with moderate to severe renal failure

Byetta, Januvia, Galvus and Onglyza do not cause hypoglycaemia but can increase the risk of hypoglycaemia when given with a Sulphonylurea.

Combination Medications

Today with technology developments pharmaceutical companies are now often able to combine two different medications into the one tablet. This is a more convenient way to take medications. It is important to be aware of the directions of how to take the tablet for example Janumet.

Janumet - a combination of Januvia and Metformin. Because of the addition of Metformin this tablet is taken twice/day. Other examples of combination medications for diabetes are: Glucovance (Glibenclamide and Metformin) and Galvumet (Galvus and Metformin)

Discuss with your doctor to see if it is suitable for you to be on a combination tablet. Your doctor will select the tablet or combination of tablets which are best for you after reviewing all the information about you and your diabetes.

You can be on one type of tablet or a mix of the above groups. The mix must not contain two or more from the Sulphonylureas or Sulphonylureas with Meglitinides.

If you reach the maximum dose of these tablets it may be necessary to start on insulin to control your blood glucose. Sometimes tablets may be continued in addition to insulin. However, if insulin is used more than once a day then Sulphonylureas and Meglitinides must be stopped.

Other types of tablets

Other medications may be prescribed if you have diabetes. These tablets are usually those which assist to lower cholesterol or blood pressure levels.

No matter which tablets your doctor orders for you, make sure you take them as directed. Remember, tablets need to be taken in conjunction with healthy eating and physical activity to help keep blood glucose levels within the acceptable ranges.

Golden Rules for All Medications:

Do not take if container or blister pack is damaged or torn.

Do not take after the expiry date. Return all expired medications to your pharmacist for correct disposal.

Keep your doctor and pharmacist informed of all medications you are taking, including over the counter products and herbal preparations, to prevent unwanted interactions.

Do not try to catch up missed doses of medications, if unsure contact your doctor or if diabetes related, your educator.

To speak to a Credentialed Diabetes Educator, contact the Diabetes WA Information and Advice Line (DIAL) on 1300 136 588

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