



# Medication Safety Series: MSS20

## Non-insulin medications for Type 2 diabetes



- A number of different types of medication are available to manage type 2 diabetes and can be used as monotherapy, or in combination, dependent on patient response.
- Timing and frequency of administration varies with each drug and formulation ([see table overleaf](#)).
- Blood glucose monitoring requirements vary dependent on the medication prescribed and the combinations used, see below for examples. Monitoring requirements are individual to each patient and need to be agreed and clearly documented within the intervention plan including a rationale for monitoring.
- **If an inpatient is prescribed a sulphonylurea drug (e.g. gliclazide, glimepiride) or a combination of oral hypoglycaemic agents, dextrose 40% oral gel and Glucagon 1 mg IM should be prescribed “as required” on EPMA as detailed in the [“Standards for use of as required and rescue medication”](#).**

### Key safety messages:

- ✓ **Metformin** – consider monitoring vitamin B12 if unexplained anaemia, dose reduction required if eGFR is below 45 ml/minute/1.73m<sup>2</sup>; stop if the eGFR is below 30 ml/minute/1.73m<sup>2</sup>
- ✓ **Sulphonylureas** – avoid long-acting preparations in the elderly. Avoid in significant hepatic impairment or if eGFR less than 30 ml/minute/1.73m<sup>2</sup>
- ✓ **Pioglitazone** – avoid in heart failure, current or history of bladder cancer, un-investigated haematuria, macular oedema. Increased risk of bone fractures; avoid in significant hepatic impairment. Rare reports of liver dysfunction – monitor liver function
- ✓ **DPP-4 inhibitors (gliptins)** – avoid if previous incidence of pancreatitis or recurrent gall stones; discontinue if symptoms of acute pancreatitis. Possible dose adjustment in renal impairment.
- ✓ **SGLT-2 inhibitors (gliflozins)** – high risk of volume depletion during acute illness or with diuretics. Increased risk of genital & urinary tract infections; possibility of diabetic ketoacidosis even with only moderate elevation of blood glucose. Follow licensing in relation to eGFR limits.
- ✓ **GLP-1 receptor agonists** - several formulations are available which have different dosing regimens and different indications – check carefully. Avoid in history of pancreatitis, significant alcohol excess and history of gall stones; discontinue if pancreatitis is suspected. Risk of diabetic ketoacidosis when concomitant insulin rapidly reduced or discontinued.
- ✓ See [NENC guidance](#) for further information.

**Sick Day Rules:** All people with T2DM require counselling on sick day rules and what to do if they become unwell. This should be reiterated at every opportunity. Advice during acute illness that causes dehydration e.g. fever, sweats, vomiting, diarrhoea, unable to eat or drink:

Metformin/SGLT2 inhibitors	Sulphonylureas / Insulin	Pioglitazone, GLP-1 agonists, DPP-4 inhibitors (Gliptins)
Temporarily stop. Can restarted after 2 to 3 days once eating and drinking fluids normally.	Doses may need to be adjusted to maintain appropriate glucose control.	Can be continued during acute illness

**Ensure fluid intake to minimise dehydration. Increase blood glucose monitoring during acute illness and check for ketones**

Diuretics, ACE inhibitors, Angiotensin Receptor Blockers and NSAIDs are also usually temporarily stopped during acute illness

Leaflet from TREND can support patients with sick day management of their T2DM - [link](#)

### Suggested frequency of Blood Glucose Monitoring in Type 2 diabetes ( [NENC guidance](#) ):

Diet & exercise only or treatment with: metformin, pioglitazone, gliptins, GLP-1 receptor agonists, SGLT2 inhibitors	Treatment with: Sulphonylureas and/or other treatment	Treatment with: Basal insulin plus oral medication	Treatment with: Twice daily pre-mixed insulin
HbA1c is the outcome measure. Routine blood glucose testing not recommended. Short-term testing <i>may</i> be required: -during illness -when therapy is changed - post-prandial hyperglycaemia	Increased risk of hypoglycaemic episodes compared with other non-insulin therapies. Individual assessment required. Testing should be considered for:  symptomatic or suspected hypoglycaemia  evaluating lifestyle changes  new or increased treatment  where required for driving or operating machinery.	Fasting glucose should be tested once a day before breakfast to titrate basal insulin plus once per day at different times to identify periods of hypo and hyperglycaemia. Once blood glucose is within target range and very stable, testing frequency can sometimes be reduced to two to three times per week.	Test twice a day at various times to include pre and post-prandial and pre-bedtime blood glucose monitoring.  Once blood glucose is within target range and very stable, testing frequency can sometimes be reduced to two to three times per week.  <b>Always test before driving</b>
<b>If corticosteroids are co-prescribed - test at midday, before evening meal and two hours after evening meal</b>			
<b>Treatment with multiple daily insulin injections should be as for Type 1 diabetics</b>			

Title: MSS20 non-insulin medications for type 2 diabetes v2

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Generic name	Brand name	Timing of administration
<b>Biguanides</b>		
Metformin	Glucophage	With or after food (main meal)
	Glucophage MR	With or after evening meal if once daily; with or after breakfast & evening meal if twice daily
<b>Sulphonylureas</b>		
Gliclazide	Diamicron	With main meal(s) of the day
	Diamicron MR	With breakfast
Glimepride	Amaryl	Shortly before or with main meal
Glipizide	Minodiab	Shortly before food
<b>Prandial glucose regulators</b>		
Repaglinide	Prandin	Usually within 15 minutes prior to main meals, but up to 30 minutes before
<b>Alpha-glucosidase inhibitors</b>		
Acarbose	Glucobay	Chewed with first mouthful of food or swallowed whole with water directly before
<b>Thiazolidinediones (“glitazones”)</b>		
Pioglitazone	Actos	With or after food
<b>DPP-4 inhibitors</b>		
Alogliptin	Vipidia	
Linagliptin	Traienta	With or after food
Saxagliptin	Onglyza	
Sitagliptin	Januvia	With or after food
Vildagliptin	Galvus	With or after food
<b>Sodium-glucose co-transporter (SGLT2) inhibitors</b>		
Canagliflozin	Invokana	Usually once daily, before first meal of the day
Dapagliflozin	Forxiga	Usually once daily at any time of the day, with or without food
Empagliflozin	Jardiance	With or after food
Ertugliflozin	Steglatro	Taken in the morning

Generic name	Brand name	Timing of administration
<b>Combination products</b>		
Pioglitazone / metformin	Competact	With or just after food
Vildglistin / metformin	Eucreas	With or just after food
Sitagliptin / metformin	Janumet	With food
Alogliptin / metformin	Vipdomet	With food
Linagliptin / metformin	Jentadueto	With food
Saxagliptin / metformin	Komboglyze	With food
Canagliflozin / metformin	Vokanamet	With food
Dapagliflozin / metformin	Xiqduo	With food
Saxagliptin / dapagliflozin	Qtern	Any time of day, with or after food
Empagliflozin / linagliptin	Glyxambi	With or without food at any time of day
Empagliflozin / metformin	Synjardy	With food
Generic name	Brand name	Timing of administration
<b>Glucagon-like peptide-1 (GLP-1) receptor agonists or “ incretin mimetics”</b>		
Dulaglutide	Trulicity	Once-weekly injection, with or without food at any time of day
Exenatide	Bydureon	Once a week on the same day each week. The day of weekly administration can be changed if necessary, as long as the last dose was administered at least three days before. Can be administered at any time of day, with or without meals.
Liraglutide	Victoza	Once daily at any time, independent of meals, and can be injected subcutaneously in the abdomen, in the thigh or in the upper arm. The injection site and timing can be changed without dose adjustment. However, it is preferable that it is injected around the same time of the day, when the most convenient time of the day has been chosen.
Semaglutide	Ozempic	Injection - once weekly at any time of the day, with or without meals.
	Rybelsus	Tablets: when stomach is empty (1 hour before or 2 hours after food)
<b>Dual glucose-dependent insulinotropic polypeptide (GIP) &amp; GLP-1 receptor agonist</b>		
Tirzepatide	Mounjaro	Injection is administered once weekly. Doses can be administered at any time of day with or without meals. Injection site should be rotated with each dose.