Media Backgrounder:

Treatment and Management of Type 2 Diabetes

Type 2 diabetes remains a leading cause of cardiovascular disorders, blindness, end-stage renal failure, amputations and hospitalisation.[1]

The prevalence and incidence of type 2 diabetes are on the increase worldwide, particularly in developing countries, with obesity rates on the increase and the westernisation of lifestyle.[1]

It is therefore important that effective management strategies are in place to ensure the correct treatment and management of this condition.[1]

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Type 2 diabetes[1,2]

- Characterised by insulin deficiency and/or insulin resistance, leading to raised glucose levels in the blood (hyperglycaemia).
- Treatment aims are to lower and control blood glucose levels to prevent and reduce possible microvascular and macrovascular complications.

Glucose-lowering therapy recommendations in type 2 diabetes[1,2,3]

- The aim of each stage of therapy is to achieve /maintain target blood glucose levels, with the target individualised for each patient. Blood glucose levels are determined by measuring HbA1c (generally HbA1c <7%), which reflects glucose over the previous 2-3 months.
- The term HbA1c refers to glycated haemoglobin, which develops when haemoglobin, a protein within red blood cells that carries oxygen throughout the body, joins with glucose in the blood, becoming 'glycated'.[3]

At diagnosis[1]	**Lifestyle measures** At diagnosis, patients are recommended to first try dietary changes and increase physical activity levels, aimed at weight loss and improved glucose control
Initial drug monotherapy[1]	**Oral medicines** If tolerated/no contraindications, metformin (a biguanide) generally is the recommended first-line drug. If metformin can't be used, another oral agent can be given.
Two-drug combinations[1]	**Oral medicines and injectable non-insulin agents** If patients fail to maintain their glucose under control while on monotherapy mainly on metformin (see above), the next step would be to add a second oral agent. If needed to reach the required HbA1c levels, patients may proceed to three-drug combination.
Three-drug combinations[1]	**Oral medicines and injectable non-insulin agents** Adding a third non-insulin agent (with a complementary mechanism of action) to a two-drug combination can work, but at this stage insulin will usually give the most robust response
Insulin[1]	**More complex insulin strategies, multiple daily doses**

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Properties of currently available glucose-lowering agents that may guide treatment choice in individual patients with type 2 diabetes mellitus.[1]

Glucose-lowering treatments for type 2 diabetes[1,2,4,5]			
Class of treatment	**Mechanism of action**	**Advantages**	**Disadvantages**
Biguanides (Metformin)[1]	Reduces glucose production in the liver and improves peripheral glucose disposal	High Efficacy No weight gain/weight loss No hypoglycaemia	Gastrointestinal (GI) side effects (diarrhoea, abdominal cramping) Rare lactic acidosis Risk of vitamin B12 deficiency
Sulfonylureas[1]	Increase/stimulate insulin release	High efficacy	Hypoglycaemia Weight gain
Thiazolidinediones[1]	Increases insulin sensitivity and reduce glucose production in the liver	High efficacy No hypoglycaemia	Weight gain Oedema/heart failure Bone fractures
DPP-4 inhibitors[1]	Increase insulin production when needed/reduce glucagon secretion	No hypoglycaemia No weight gain	Intermediate/modest HbA1c efficacy Urticaria/angio-oedema Risk of pancreatitis
SGLT2 inhibitors[4,5]	Reduce reabsorption of glucose in the kidney, increase glucose excretion via urine	High efficacy No hypoglycaemia No weight gain/weight loss Reduced blood pressure	Genital mycotic (fungal) infections Postural dizziness, orthostatic hypotension, or hypotension
GLP-1 receptor agonist[1]	Increase insulin/reduce glucagon secretion. Slowing gastric emptying, decreasing appetite	High efficacy No hypoglycaemia No weight gain/weight loss	GI side effects (nausea, vomiting) Injectable
Insulin[1]	Activates insulin receptors. Increase glucose disposal, reduce glucose production in the liver	Highest efficacy (universally effective)	Hypoglycaemia Weight gain Injectable Glucose monitoring required

Choice is based on patient and drug characteristics, with the overriding goal of improving glycaemic control, while minimising side effects.[1]

References

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