Plain English Summary

Continuous glucose monitoring systems for children and adults with type 1, monogenic or pancreatogenic diabetes mellitus

What does the guidance say?

Continuous glucose monitoring (CGM) systems are recommended for government subsidy for children and adults with type 1, monogenic or pancreatogenic diabetes mellitus who meet certain clinical criteria.

Subsidy only applies to the:

- Abbott Freestyle Libre 2 Plus model of the sensor and reader,
- Dexcom G6 model of the sensor and applicator, transmitter and an optional receiver, or
- Dexcom G7 model of the glucose sensing and receiver subsystems.

What are monogenic and pancreatogenic diabetes mellitus?

Monogenic diabetes mellitus includes neonatal diabetes (which appears in infancy), maturity onset diabetes of the young (which begins in adolescence or early adulthood), and other uncommon forms of diabetes caused by single gene mutations. It results from a mutation in one of the many genes that control the growth and function of insulin-producing cells in the pancreas. These mutations impair the body's ability to produce or control insulin levels effectively, leading to high blood glucose levels.

Pancreatogenic diabetes mellitus occurs when blood glucose levels become high due to damage to, or removal of the pancreas. When the pancreas is surgically removed or damaged by disease, insulin production is reduced or lost, leading to high blood glucose. Like other types of diabetes, persistently high blood glucose levels can lead to serious long-term complications including vision loss, kidney disease, nerve damage, foot and leg problems, and an increased risk of stroke and heart disease.

Some people with monogenic or pancreatogenic diabetes mellitus may need regular blood glucose monitoring and treatment with diabetes drugs or insulin injections.

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What is type 1 diabetes mellitus?

Insulin is a hormone, made by the pancreas, that helps glucose (a type of sugar) from food enter cells in the body so it can be used as energy or stored for later use. People with type 1 diabetes mellitus have high glucose in their blood because their body does not produce enough insulin. This is usually due to the body's own immune system destroying the insulin-producing cells in the pancreas.

Over time, high blood glucose levels can cause a range of problems including vision loss, kidney disease, foot and leg problems and an increased risk of stroke and heart disease. Although type 1 diabetes mellitus is often diagnosed in childhood, it can develop at any age.

People with type 1 diabetes mellitus have to regularly self-monitor their blood glucose levels, usually with a finger-prick and a glucose meter, and inject insulin to keep their blood glucose levels within the target range. Every few months, their doctor will also check their average blood sugar levels using a test called hemoglobin A1c (HbA1c).

The user will decide when and how much insulin they need to inject by considering their blood sugar reading, the amount of sugar and starch (carbohydrates or "carbs") in their food, and their current and upcoming activities.

If a person injects too little insulin, their blood sugar could rise above their target level. Prolonged high blood sugar causes a high HbA1c result, which indicates a higher risk of developing long-term complications.

If a person injects too much insulin or does not eat enough carbs, their blood sugar will become very low (also known as hypoglycaemia or "hypo"). It can happen fast and can be dangerous, especially when it occurs during sleep. Some people do not have clear signs of having hypo, such as those who have been living with type 1 diabetes mellitus for some time.

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What is a CGM system?

A CGM system is a wearable technology used to monitor blood glucose levels throughout the day without finger-pricks. An applicator is used to insert a sensor under the skin that measures blood glucose levels and wirelessly sends the readings to a small recording device (receiver) or a smartphone to display the readings and trends.

A real-time CGM is a system that automatically sends glucose readings to the user via a transmitter and has alerts for low and high glucose levels, while an intermittently scanned system requires users to manually scan the sensor before they can see their readings and trends.

Who can use a CGM system?

A CGM system can be used by children and adults with type 1 diabetes mellitus, or monogenic or pancreatogenic diabetes mellitus who require similar management as type 1 diabetes mellitus if they:

- have frequent, unpredictable, severe or night time low blood glucose levels (also known as hypoglycaemia or “hypo”),
- are unable to recognise or communicate symptoms of hypoglycaemia, or
- have very high HbA1c levels

despite regularly monitoring their blood glucose levels by finger-pricking and using insulin as best as they can. Your doctor can advise if a CGM system is suitable for you and how often you need to use it to monitor your blood glucose levels.

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Why were CGM systems recommended for subsidy?

ACE evaluates how well a medical device works in relation to how much it costs compared to the current standard of care. CGM systems were recommended for subsidy because their benefits in reducing HbA1c levels, improving the amount of time target blood glucose ranges are achieved, and reducing episodes of very low blood glucose for certain children and adults with type 1 diabetes mellitus justify their costs compared to self-monitoring blood glucose by finger-pricking.

Subsidy was also recommended for certain people with monogenic or pancreatogenic diabetes mellitus whose condition requires management similar to type 1 diabetes mellitus, as the CGM systems are likely to be safe and effective in controlling their blood glucose levels.

What does subsidy for this device mean for me?

This subsidy applies to Singaporean citizens receiving inpatient or outpatient treatment in a public healthcare institution. If your doctor prescribes the following CGM systems for you, and you meet the subsidy criteria, the cost of the medical device will be subsidised by 30% to 80%:

- Abbott Freestyle Libre 2 Plus model of the sensor and reader,
- Dexcom G6 model of the sensor and applicator, transmitter and an optional receiver, or
- Dexcom G7 model of the glucose sensing and receiver subsystems.

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