

Continuous Glucose Monitoring

Information about fully-subsidised continuous glucose monitoring for children and young people with type 1 diabetes

Continuous glucose monitoring (CGM) can help in managing diabetes. CGM may assist children and young people, and their parents/carers, in reducing stress, anxiety and unscheduled visits to the hospital.

Regular (finger prick) blood glucose monitoring can help you see the effects of food, exercise, medication, hormones and illness on blood glucose levels. It can show you when you need to take action to treat a high or low blood glucose level. Structured blood glucose monitoring will help identify trends or changes in blood glucose levels that you may wish to share with your diabetes team. CGM is a different way to monitor glucose levels. By continually monitoring and displaying glucose levels throughout the day and night, these devices provide more information than finger prick blood glucose monitoring to help manage diabetes.

As of April 2017 the Australian Government provides access to subsidised CGM products to eligible children and young people aged under 21 years, living with type 1 diabetes. This subsidy is available through the National Diabetes Services Scheme (NDSS). See page 4 for more details or visit ndss.com.au/CGM

What is CGM?

Continuous glucose monitors are small wearable devices that measure and display glucose levels throughout the day and night. They can be programmed to sound alarms and send warnings if glucose levels move outside an individually set target range. CGM devices also display arrows to show whether the glucose level is rising, falling or remaining steady. The graphs on the CGM receiver can be reviewed to look for patterns and trends in glucose levels.

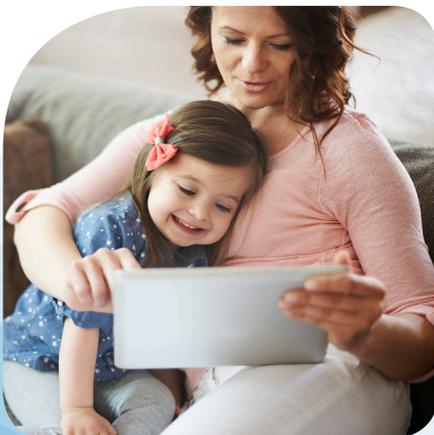
Continuous glucose monitors have three main parts:

- » The **sensor** sits on the skin with a small electrode inserted just under the skin on the tummy. It measures the level of glucose in the fluid between your cells. A new sensor needs to be inserted every 6 to 7 days, depending on the device.
- » The **transmitter** is attached to the sensor and sends glucose readings to the wireless receiver, insulin pump or compatible smart phone. Transmitters are reusable but need to be replaced every 3-12 months, depending on the device.
- » The **receiver** allows you to view your glucose data. The receiver may be a standalone device, insulin pump or compatible smartphone via an app. The receiver also stores glucose data, which can be uploaded for you and your diabetes team to review, to help in making decisions about changes to insulin doses or pump settings.

Why use CGM?

CGM has a number of benefits:

- » **24/7 readings.** CGM allows you to see glucose levels across the day, rather than just at a single point in time. The CGM graphs may help in learning how different things, such as food and exercise, affect blood glucose levels. Reviewing these graphs for patterns may help you to balance food, exercise and insulin doses.
- » **Trend arrows.** As well as showing glucose levels at any point in time, CGM shows whether glucose levels are rising, falling or stable and how fast they're changing.
- » **Alarms.** You can set the CGM device to sound an alarm if the glucose level rises above or drops below the individually set target levels. The alarm allows you to act before glucose levels rise too far above or drop too far below your target range. The alarms may be especially useful for people who can't always tell when they're having a hypo (low blood glucose level).
- » **Overnight monitoring.** CGM devices measure glucose levels throughout the night without the need to wake up and do finger prick checks. Calibrations may sometimes be needed overnight but can usually be timed to avoid this. Alerts can be set to wake you if glucose levels drop below or rise above your target range and need treatment.
- » **Reduced need for finger prick checks.** CGM doesn't completely replace the need to do finger prick checks but it does reduce the number needed. The devices still need to be calibrated at least twice per day (according to the manufacturers' instructions) by doing a finger prick blood glucose check and entering the result. This is important to ensure the accuracy of the readings from the CGM device. It is also recommended that readings above or below your target range are confirmed with a finger prick blood glucose check before treatment.
- » **Peace of mind.** Being able to see glucose levels at any time, and having high and low glucose alerts if levels go outside the individually set target range, can provide reassurance and reduce anxiety.
- » **Data sharing.** Some CGM devices have the option of sharing glucose data with up to five other people via an app on their smartphone or smart device, or SMS messages to notify them of alerts and alarms. This can be particularly useful if you are a parent or carer of a young child as it allows you to monitor your child's glucose levels when you are not with them. Data can also be downloaded to share with your diabetes team.
- » **Insulin pump integration to prevent hypoglycaemia (hypos).** Some devices work with a compatible insulin pump and can temporarily suspend insulin delivery from the pump if glucose levels drop below your target range or if the sensor predicts the glucose level will become too low. Insulin delivery from the pump starts again once glucose levels start rising again. This may help to prevent hypos or to make them easier to manage. Less food may also be needed to treat a hypo.



Downsides to CGM

While CGM offers many benefits, there are also things that some people don't like or find difficult and these are important to consider before making a decision to use CGM.

- » **Doesn't replace blood glucose monitoring.** While using CGM can reduce the number of finger prick checks needed, CGM devices still need calibrating at least twice per day, by entering a finger prick glucose reading. Finger prick checks are also recommended when glucose levels are changing rapidly, to confirm hypoglycemia, before giving a correction dose for high glucose levels, and when symptoms don't match the CGM reading.
- » **Accuracy.** CGM devices measure glucose levels in the interstitial fluid (the fluid between your cells) rather than the blood. Because glucose travels to the blood first and then to the interstitial fluid, CGM and blood glucose levels won't usually be exactly the same. When glucose levels are stable, the readings should be close, but there will be a greater difference when glucose levels are rising or falling quickly.
- » **Being attached.** Some people don't like wearing the sensor and transmitter, particularly if they are using an insulin pump, as they then have two different devices attached to their body. In children it can also be difficult to find suitable sites to insert the sensor, particularly if they don't have much body fat. Your health professional can help with working out the best sites for wearing the sensor.
- » **Staying attached.** It can be difficult for some people to keep the sensor attached, particularly if they spend a lot of time in water and/or sweat a lot during exercise. The sensor might also be knocked off while playing or during sport. Unfortunately, if they come off they can't be reused but this can usually be prevented by using extra tape to keep the sensor attached. Your health professional can provide advice on the available options and which tape might be best for you.
- » **Information overload.** While the additional information CGM provides has many benefits, it can also be overwhelming to see what blood glucose levels are doing all the time. Your health professional can help you to learn how to use and interpret this information so that it can be used to improve diabetes management rather than becoming something else to worry about, particularly if glucose levels are often out of target.
- » **Alarm fatigue.** While the CGM alarms can be very helpful, if they are occurring often, some people can find them annoying and disruptive and may even start to ignore some of the alarms. For this reason, it's important to speak to your health professional about setting the right targets for you or your child, so you are alerted when you need to take action to correct high or low glucose levels.
- » **Cost.** For those who aren't eligible for fully-subsidised CGM products through the NDSS, the cost of CGM is around \$4000-\$5000 per year and is not covered by private health insurance.

Access to CGM through the NDSS

Children and young people with type 1 diabetes aged under 21 years now have access to subsidised CGM products through the NDSS if they meet certain criteria.

To be eligible for this initiative you must be registered with the NDSS and the following must apply:

For children 10 years or younger

- » it is expected that using CGM will help them in managing their diabetes
- » their family/carer must be willing and able to use CGM
- » their family/carer must be willing to be involved in a diabetes management plan that includes CGM

Children who meet these criteria and begin using subsidised CGM products will continue to have subsidised access after they turn 11 (until they are 21).

For young people aged 11 to less than 21 years

- » it is expected that using CGM will help them in managing their diabetes
- » the young person or their family/carer must be willing and able to use CGM
- » the young person or their family/carer must be willing to be involved in a diabetes management plan that includes CGM

They also need to meet one of four extra criteria, related to hypoglycemia (low blood glucose levels):

- » they have had more than one hypo a year requiring help from another person
- » they have difficulties detecting the symptoms of hypos
- » they have a significant fear of hypos which is affecting their health or wellbeing or causing them to have regular high blood glucose levels
- » they are unable to recognise or tell someone about their symptoms of a hypo

For both groups, subsidised access ceases after the age of 21.

The CGM initiative covers the full cost of sensors and transmitters but the cost of a receiver, if preferred over the use of an insulin pump or smartphone, will need to be paid for by you.

To access CGM products through the NDSS, you or your child will need to see an authorised health professional, such as your endocrinologist or credentialed diabetes educator. They can work out whether you are eligible and if using CGM will help you. If eligible, your health professional will need to fill out and sign the NDSS *Continuous Glucose Monitoring Eligibility Assessment form*. Once this has been submitted and processed you will be contacted to confirm your eligibility.

For those new to using CGM, a starter kit will be sent to the health professional nominated on your form. They will then help you to set up and show you how to use the device. After this, and for those who are already using CGM, products can be ordered through any NDSS Access Point (usually a community pharmacy) in a similar way to ordering blood glucose test strips, insulin pen needles and/or pump consumables.

Available CGM Devices

There are currently five CGM devices available through the NDSS. The device you choose will depend on:

- » whether the CGM will be used in conjunction with an insulin pump, a compatible smartphone or separate receiver
- » whether you want the option of sharing CGM data
- » personal preference

Speak with your diabetes health professional for help in choosing a device which best suits you or your child.

CGM device summary

| Device | Works with | Provided free through NDSS subsidy | Product lifespan | Other features |
|----------------------------|---|--|-------------------------|---|
| Dexcom G4 Platinum | Animas Vibe insulin pump OR Dexcom G4 Platinum Receiver | Dexcom G4/G5 Platinum Sensor | Sensor – 7 days | |
| | | Dexcom G4 Platinum Transmitter | Transmitter – 6 months | |
| Dexcom G5 Mobile | Compatible iOS (Apple) or Android smartphone or smart device OR Dexcom G5 Mobile Receiver | Dexcom G4/G5 Platinum Sensor | Sensor – 7 days | Dexcom Share feature allows up to 5 people to follow the user's glucose data using the Dexcom Follow App on their mobile phone or smart device. |
| | | Dexcom G5 Mobile Transmitter | Transmitter – 3 months | |
| Medtronic Guardian Connect | Compatible iOS (Apple) smartphone or smart device | Enlite Sensor | Sensor – 6 days | SMS messages can be sent to up to 5 people to notify them of alerts and alarms on the user's CGM device. |
| | | Medtronic Guardian Connect Transmitter | Transmitter – 12 months | |
| Medtronic Guardian Link | Medtronic Minimed 640G insulin pump | Enlite Sensor | Sensor – 6 days | SmartGuard feature can predict when glucose levels are approaching a low level and automatically stop insulin delivery from the user's pump, resuming delivery when their glucose level recovers. |
| | | Medtronic Guardian Link Transmitter | Transmitter - 12 months | |
| Medtronic Minilink | Medtronic Paradigm Veo or Paradigm Real-Time insulin pumps | Enlite Sensor | Sensor – 6 days | Low Glucose Suspend feature will suspend insulin delivery from the pump if the user doesn't respond to low glucose alerts. |
| | | Medtronic Minilink Transmitter | Transmitter - 12 months | |

Product lifespan and access

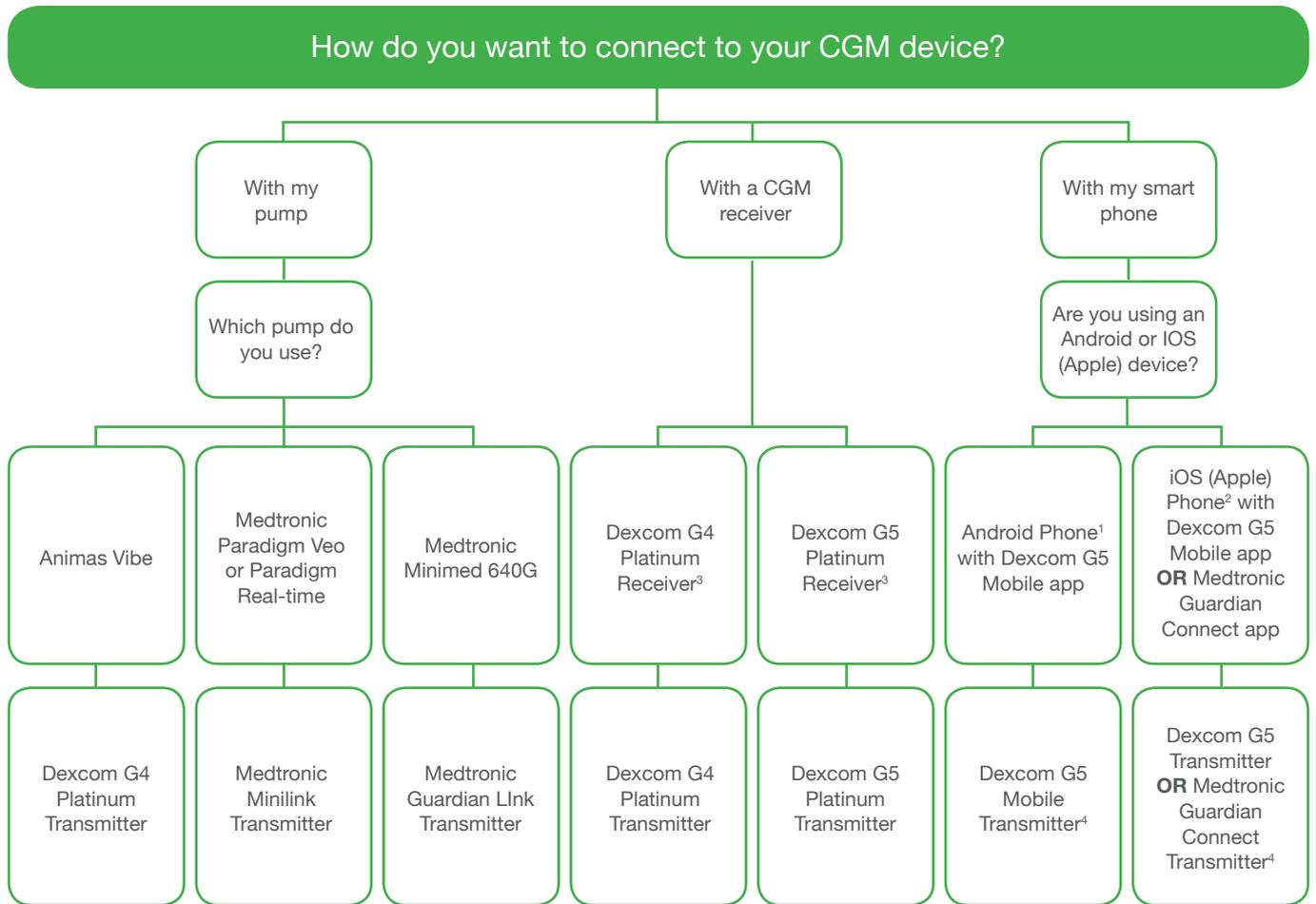
Due to the high cost of CGM products, all NDSS product orders are monitored to ensure usage is consistent with the recommended product lifespan for each device. NDSS Access Points receive alerts when you place an order. These alerts are based on the recommended product usage lifespan for each device. If you reach the recommended annual limit for CGM products through the NDSS you will be unable to order more subsidised products until one year passes from the date of your first order. If you are using CGM products according to the product's lifespan you should not encounter any difficulties when accessing CGM products through NDSS Access Points.

For more information on CGM product lifespans please see the table above.

Faulty devices

If you access a faulty CGM sensor or transmitter through an NDSS Access Point you should contact AMSL for Dexcom products (1300 851 056) or Medtronic for Medtronic products (1800 777 808) in the first instance. Contacting the supplier rather than ordering more supplies may mean you are able to receive a replacement product from AMSL or Medtronic, without affecting your annual product supply limits.

Compatibility Flowchart

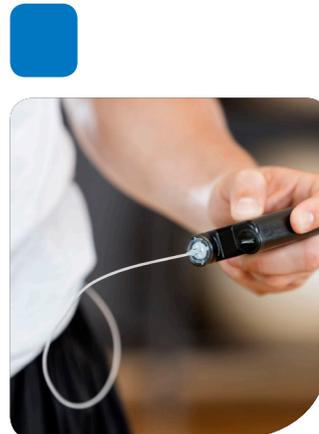


1 For information about compatible Apple iOS and Android devices for use with the Dexcom G5 Mobile visit: dexcom.com/ous-compatibility-page

2 For information about compatible Apple iOS devices for use with the Guardian Connect visit: medtronic-diabetes.com.au/guardian-connect

3 The Dexcom G4 Platinum and Dexcom G5 Mobile receivers are an alternative to using a compatible iOS or Android device and do not require cellular data or Wi-Fi connectivity. They are not subsidised through the NDSS Initiative and can be purchased separately through AMSL. For more details, visit amsldiabetes.com.au/shop.

4 The Medtronic Guardian Connect and Dexcom G5 Mobile transmitters must be synced to a compatible Apple IOS or Android device with Bluetooth connectivity. After syncing the apps will function without cellular data or Wi-Fi connectivity. However, for sharing services to work you will need access to regular cellular data or Wi-Fi connectivity.



More Information

If you are interested in learning more about CGM, we encourage you to speak with your diabetes healthcare team.

Visit the NDSS website for more information about subsidised CGM for children and young people with type 1 diabetes.

ndss.com.au

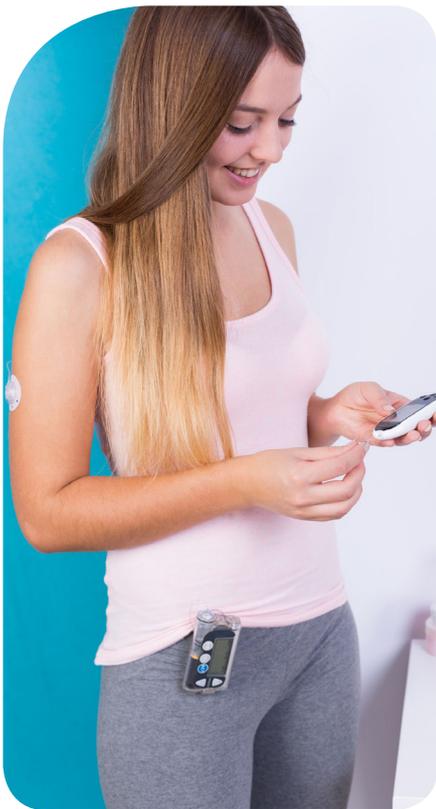
Visit the Diabetes Australia website for more information about children and young people with type 1 diabetes.

diabetesaustralia.com.au

More information on the CGM devices available through the initiative can be found by visiting the supplier websites:

- » [AMSL Diabetes](http://amsl.com.au) (for Dexcom products)
- » [Medtronic](http://medtronic.com.au)

You can also call the NDSS Helpline on **1300 136 588**. The Helpline operates between 8:30am to 5pm Monday to Friday and from 9am to 12pm on Saturdays and national public holidays.



The NDSS and you

The NDSS provides a range of services to help you manage your diabetes. These include the NDSS Helpline 1300 136 588 and the NDSS website ndss.com.au for advice on diabetes management, NDSS products and a range of support programs to help you learn more about managing your diabetes.

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