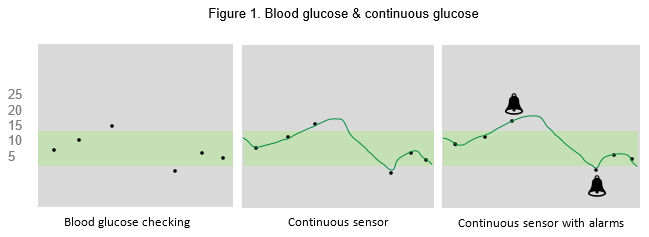
| Continuous Glucose Monitoring (CGM) in the Inpatient Setting  Clinical Staff Information |  |
| --- | --- |

CGM monitoring devices are small wearable monitors which produce continuous data via a small sensor inserted into the subcutaneous tissue. The sensors measure interstitial glucose concentration, a close representation of a patient’s blood glucose level. Data is automatically sent to either the mobile phone, reader or insulin pump.

These devices allow users to see and analyse patterns and trends instead of just a single blood glucose level at a single point in time. This enhances the user’s ability to see the effects of insulin, other medicines, food, physical activity, and illness on their glucose levels (Figure 1).

Customised alarms can be configured to identify when CGM level is too high or low. The user requires their reader (smart phone, reader or receiver) to be within 6-8 metres to ensure alarms remain active.



BGL target range

|  |  |  |  |
| --- | --- | --- | --- |
| **Current devices used commonly in Australia** | | | |
| **Dexcom G6** | **Guardian Connect 3, Guardian Link 3, Medtronic Bluetooth Guardian Link 3** | **Guardian 4** | **Abbott Freestyle Libre 2** |
|  |  |  |  |
| Automatically sends CGM to smart phone app or receiver  Does not require routine point of care capillary blood glucose levels for calibration  The recommended area of insertion is the abdomen or triceps area  May or may not be linked with a compatible insulin pump | Automatically sends CGM levels to smart phone app  Requires point of care capillary glucose levels for calibration 2-4 times per day  Recommended insertion to abdomen  May or may not be linked with a compatible insulin pump | Automatically sends CGM levels to smart phone app  Does not require point of care capillary glucose levels for calibration  Recommended insertion to abdomen or posterior upper arm  Is linked with a compatible insulin pump | Automatically sends CGM levels to smart phone app or after swiping for glucose reader  Phone or reader must be within 6 metres to ensure data storage and alarm function. If separated (ie during surgery) the device can be swiped to ensure data storage is retained  Does not require routine point of care capillary blood glucose levels for calibration  The recommended area of insertion is the triceps area only  Does not link with any insulin pump |

**Interpreting the arrows**

The CGM devices display arrows showing when glucose levels are rising, falling or stable and indicate how quickly the glucose levels are changing. The devices can be programmed to sound an alarm if blood glucose levels are outside the target range or are changing rapidly, helping people respond to and avoid hypoglycaemia or hyperglycaemia.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Dexcom G6** | | **Medtronic** | | **Libre 2** | |
| Trend arrows | Where glucose is going | Trend arrows | Where glucose is going | Trend arrows | Where glucose is going |
|  | Steady 1.8mmol/L in 30 minutes |  | Rising or falling at a rate of 1.8 mmol/L in 30 minutes or more. | Icon  Description automatically generated with medium confidence | Steady |
|  | Rising or falling up to 3.4 mmol/L in 30 minutes |  | Rising or falling at a rate of 3.3 mmol/L in 30 minutes or more. | Icon  Description automatically generated | Rising or falling between 1.8 and 3.0 mmol/L in 30 minutes |
|  | Rising or falling up to 5 mmol/L in 30 minutes |  | Rising or falling at a rate of 5.1 mmol/L in 30 minutes or more. | Icon  Description automatically generated | Rising or falling more than 3.0 mmol/L in 30 minutes |
|  | Rising or falling more than 5 mmol/L in 30 minutes | Custom | Rising at a custom rate, set from 0.06 mmol/L to 0.28 mmol/L per minute. |  |  |

**Hypoglycaemia interpretation with CGM**

If the person with diabetes suspects they may be experiencing a hypoglycaemic event, or if their CGM is detecting a low BGL under 4.0 mmol/L then this should always be confirmed with a point of care (fingerstick) capillary measurement with a standard strip meter.

If a hypoglycaemic event is confirmed, then fingerstick blood glucose readings are to be relied upon until the hypoglycaemic event is resolved, at which point the person with diabetes and their health care team can rely upon the CGM results again if no other contraindications.

**Troubleshooting**

|  |  |
| --- | --- |
| **Common issues** | |
| Bluetooth Connectivity | * Ensure the CGM receiving device (smart phone, receiver, reader or insulin pump) is within 6 meters of the sensor. * Ensure the user is hydrated. * Ensure the CGM sensor is not inserted into a site with significant oedema * Has the CGM sensor been dislodged? * Has the CGM sensor expired? |
| Variable fingerstick blood glucose levels compared to sensor trace | CGMs measure interstitial glucose levels which are different to the more traditional fingerstick blood glucose readings. The accepted variation is dependent on the CGM value   * CGM value >5.6mmol/L: <20% absolute difference between CGM and fingerstick * CGM value ≤5.6mmol/L: <1.1mmol/L absolute difference between CGM and fingerstick   CGM readings are more likely to deviate from the fingerstick reading if the glucose readings are rapidly changing such as rapidly falling glucose or after a high carbohydrate meal. |

**Links for more information**

[Medtronic CGM](https://www.medtronic-diabetes.com.au/products/continuous-glucose-monitoring)

[AMSL (Dexcom)](https://www.dexcom.com/en-au/dexcom-g6-cgm-system)

[Freestyle Libre 2](https://www.freestylelibre.com.au/)

[NDSS CGM Fact sheet](https://www.ndss.com.au/about-diabetes/resources/find-a-resource/continuous-glucose-monitoring-fact-sheet/)

[NDSS Flash GM Fact sheet](https://www.ndss.com.au/about-diabetes/resources/find-a-resource/flash-glucose-monitoring-fact-sheet/)