Quick guide: Interpreting CGM data

Adoption of continuous glucose monitoring (CGM), including flash glucose monitoring, is increasing rapidly in the UK; however, there is a shortage of skills related to diabetes technology amongst healthcare professionals. The benefits of CGM cannot be fully realised if healthcare professionals and users do not know how to interpret the vast amount of data produced, and to set appropriate glycaemic targets. This quick reference guide is an accompaniment to the article by Millson and Hammond (2020) and offers a brief summary of the structured approach to interpreting CGM data contained therein.

Citation: Quick guide: Interpreting CGM data. *Journal of Diabetes Nursing* **24**: JDN143

Step 1: Assess user history

1. Quality of data
   - Number of days worn (aim for 14)
   - Percentage of time CGM is active (aim for >70% of the time)
2. Insulin therapy
   - What insulin
   - MDI or insulin pump
   - Basal and bolus doses
3. Physical activity
4. Working or non-working days
5. Illness – any additional therapy (e.g. steroid treatment)

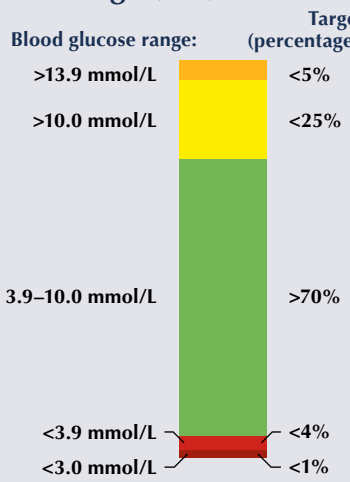
Step 2: Assess Time In Range (TIR)

Overall goal (type 1 and 2 diabetes):
Aim for >70% of the day with blood glucose 3.9–10.0 mmol/L

Priority 1:
Minimise Time Below Range (<3.9 mmol/L)

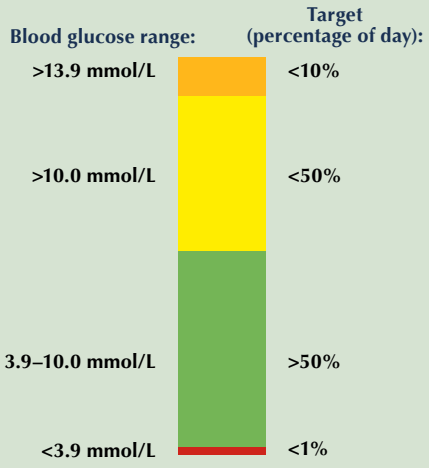
Priority 2:
Then minimise Time Above Range (>10.0 mmol/L)

Note: A TIR of 70% reflects an HbA_{1c} of 53 mmol/mol (7.0%), while each 10% increase in TIR represents an HbA_{1c} reduction of 5 mmol/mol (0.5%).

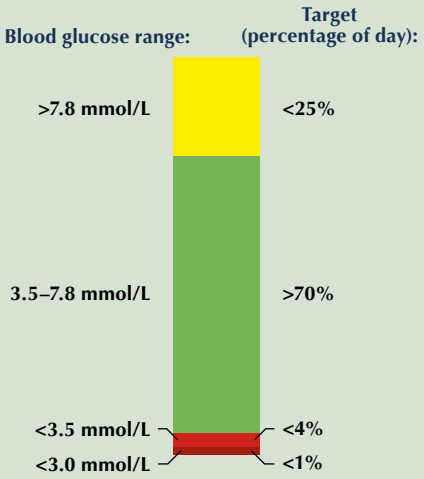


Time In Range (TIR) targets for other patient groups

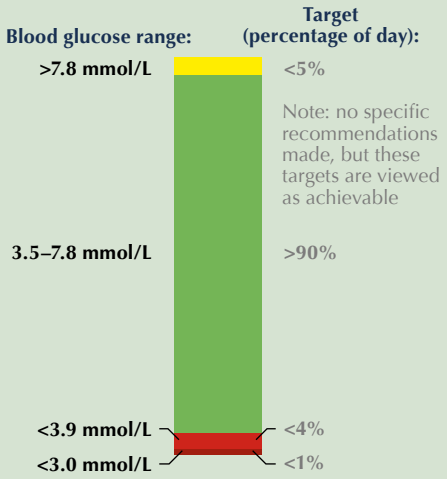
Older/high-risk patients (type 1 and type 2 diabetes)



Pregnancy: Type 1 diabetes (note more narrow glucose ranges)



Pregnancy: Type 2 diabetes and GDM (note more narrow glucose ranges)

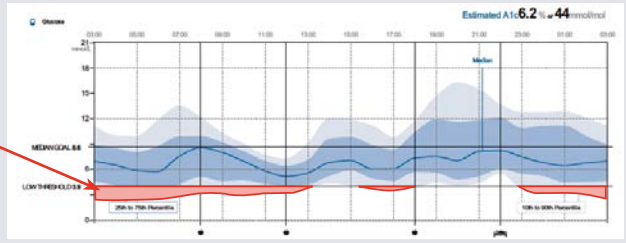


Step 3: Review AGP

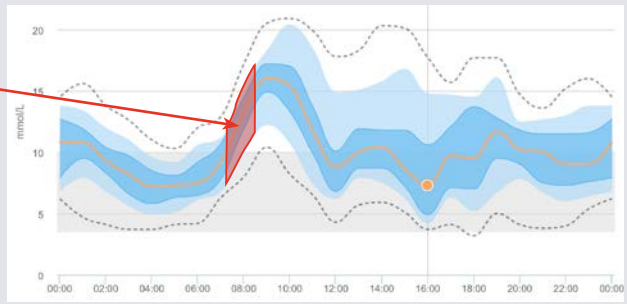
1. Review ambulatory glucose profile for each part of the day:
   - Overnight
   - Morning meal
   - Midday meal
   - Evening meal
2. Look at food intake – is the user counting carbohydrates?
3. Physical activity – does it cause hypoglycaemia or glucose excursions?)
4. Assess for anomalous days
   - Is there high glucose variability?
   - May need to look at day-to-day analysis to establish any underlying issues (see Step 4)

Watch out for:

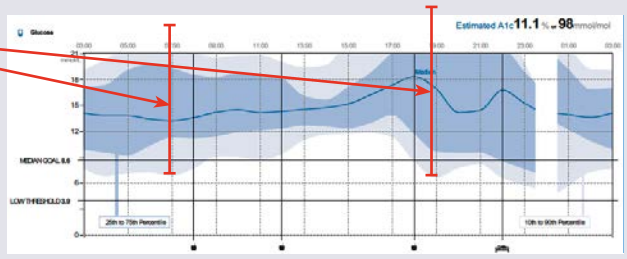
Hypoglycaemia
Consider basal/bolus doses, exercise, etc. May need to examine daily traces



Post-meal hyperglycaemia or overcorrection of hypoglycaemia
Here there is low variation from the median, so a daily post-breakfast glucose rise is likely

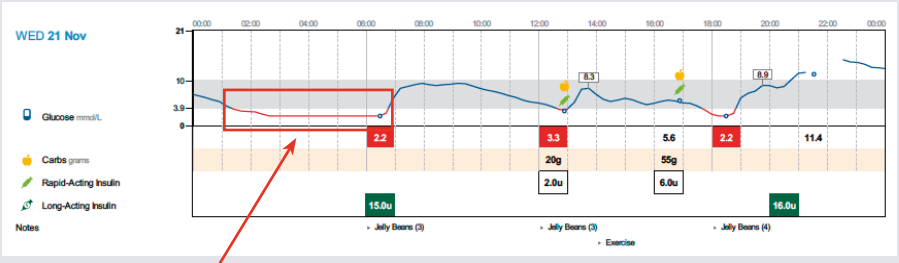


High variability
This suggests that observed patterns are not reliable and that daily traces will need to be reviewed (see Step 4). Consider causes (e.g. inaccurate carbohydrate counting, late meal bolus, exercise, stress)



Step 4: Review daily traces

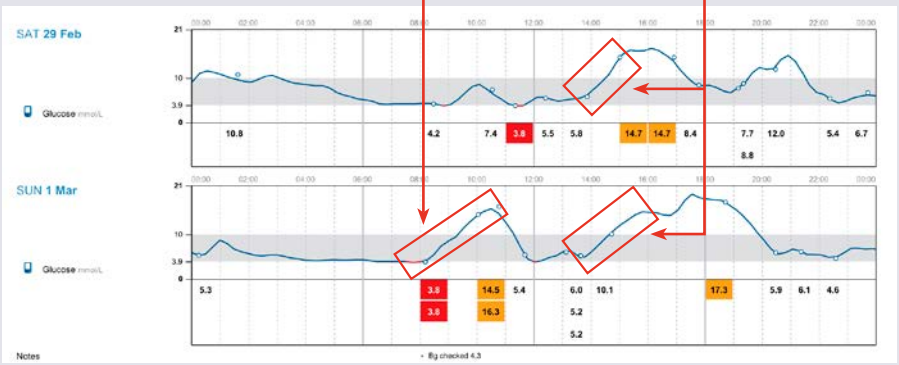
1. Look for repeated daily patterns
2. Look at baseline glucose levels, overnight and over 3 hours after meals
   - Consider exercise, snacks, alcohol
3. Look at prandial glucose excursions
   - Are insulin:carbohydrate ratios correct?
   - Do glucose excursions differ after different meals? Are different bolus delivery strategies required for different meal compositions?
   - If glucose levels do not return to baseline at around 4 hours, do bolus doses, timing or the numbers need adjusting?



Overnight hypoglycaemia
Basal insulin dose too high?

Overcorrection of hypoglycaemia

Post-lunch glucose rise
Are insulin:carbohydrate ratio and bolus timing correct?



Caution: Avoid initiating change without clear patterns – may need longer to collect data.