Continuous Glucose Monitoring Clinical Guide

Step-by-step instructions for interpreting the data

Continuous glucose monitoring (CGM) has been shown to improve diabetes management by lowering glucose and reducing the risk of hypoglycemia. CGM data is shown visually in an ambulatory glucose profile (AGP); see example below. Use this guide to maximize CGM, effectively interpret CGM data and engage patients in shared decision making.

Step 1: Check for adequate data.
The example AGP below shows **13 days*** of data. Make sure your patient has data for at least 7 to 10 days. Ideal is 14 days or more of data.

Step 2: Review patient factors that affect AGP.
Consider writing these factors on a printed copy of the AGP. See example below for noting name, age, weight, type of diabetes and daily diabetes medications (name, dose and timing); usual times for waking and bedtime, for morning (B), midday (L) and evening (D) meals and snacks, and for physical activity.
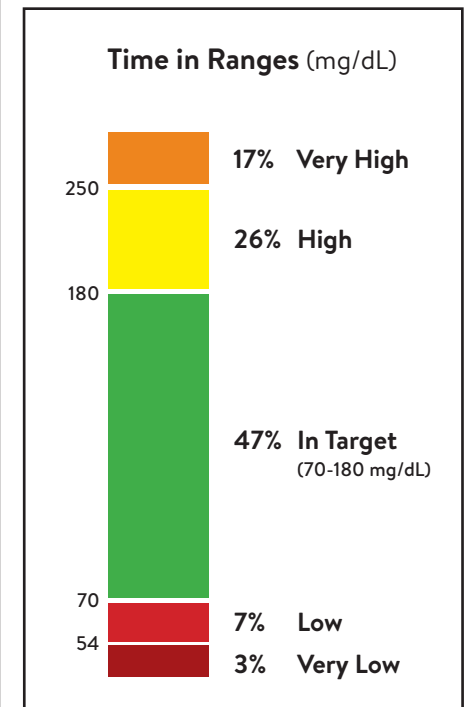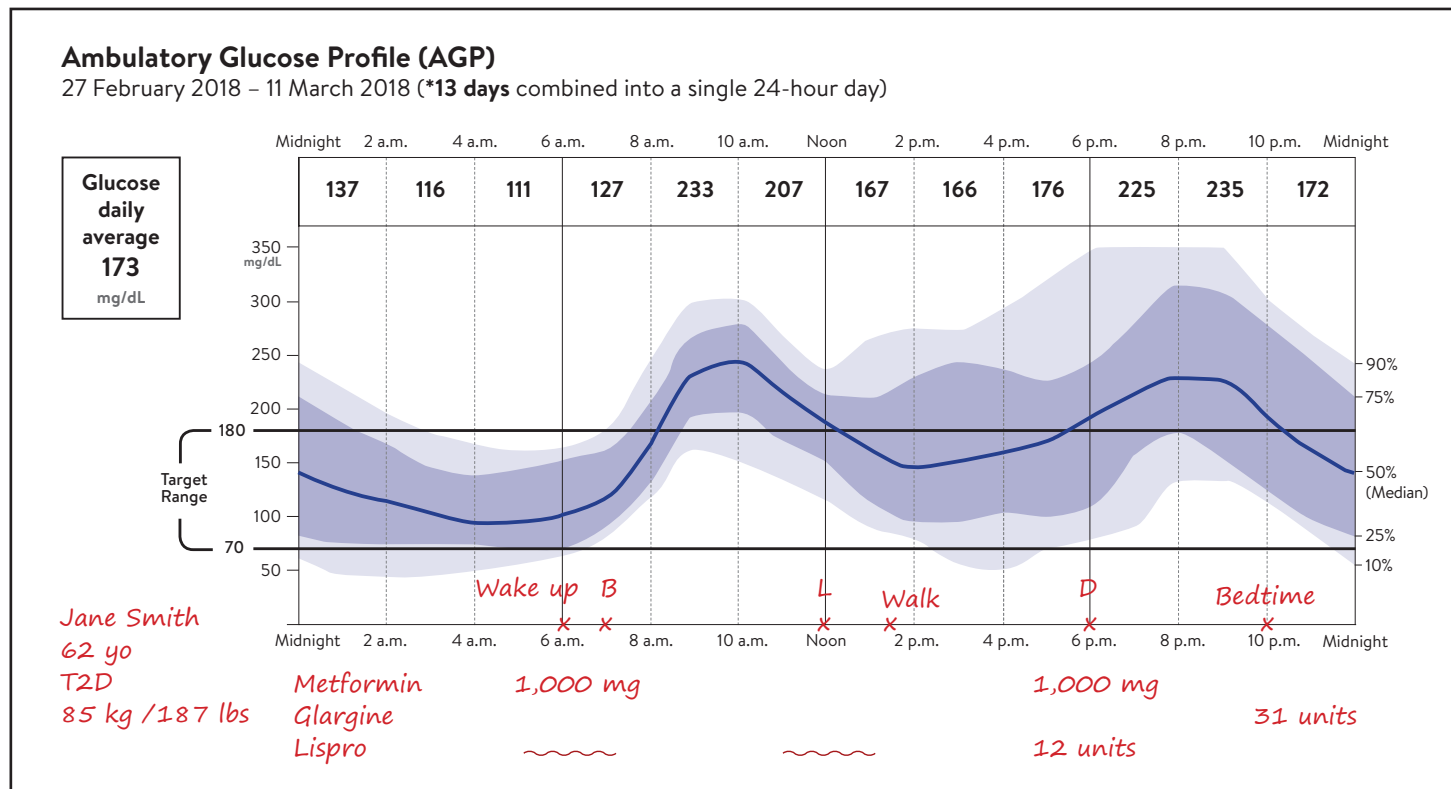
Step 3: Talk to patient about their AGP.
Ask patient: "What do you see in your AGP in terms of glucose patterns?" Explain that generally you need to be in target range 70% or more of the time to have an A1C less than 7%. The goal is to be below target (lower than 70 mg/dL) less than 3% of the time.

Step 4: Look for patterns of low glucose levels on AGP.
If the 10th-percentile line (indicating 10% of all glucose values are below this line) is below 54 mg/dL, take immediate action to reduce

Ambulatory Glucose Profile (AGP)
27 February 2018 – 11 March 2018 (***13 days** combined into a single 24-hour day)

Glucose daily average **173** mg/dL

Midnight	2 a.m.	4 a.m.	6 a.m.	8 a.m.	10 a.m.	Noon	2 p.m.	4 p.m.	6 p.m.	8 p.m.	10 p.m.	Midnight
137	116	111	127	233	207	167	166	176	225	235	172

Jane Smith
62 yo
T2D
85 kg / 187 lbs

Metformin — 1,000 mg — 1,000 mg
Glargine — 31 units
Lispro — 12 units

Wake up B   L   Walk   D   Bedtime

Time in Ranges (mg/dL)

- 17% Very High
- 26% High
- 47% In Target (70-180 mg/dL)
- 7% Low
- 3% Very Low

hypoglycemia. If the 10th-percentile line drops between 69 and 54 mg/dL, consider therapy changes to reduce hypoglycemia. Look at separate daily views (see examples, right) to verify patterns of low glucose.

Step 5: Look for patterns of high glucose levels on AGP.
Consider reasons for high glucose. Ask patient: "How often do you miss taking your medication? Are your highs before or after meals?" Look at separate daily views (see examples, right) to verify patterns of high glucose.

Step 6: Look for areas of wide glucose variability on the AGP.
Note the area between the 25th and 75th percentiles (dark shaded area above and below the median). Discuss with patient what might be causing any wide variability in glucose levels.

Step 7: If previous CGM data and AGP are available, discuss how current patterns compare.
Note patterns that have improved and patterns to work on. Reinforce any positive improvements. Ask patient: "What strategies did you use that were helpful in making changes? What ideas do you have for further improvement?"
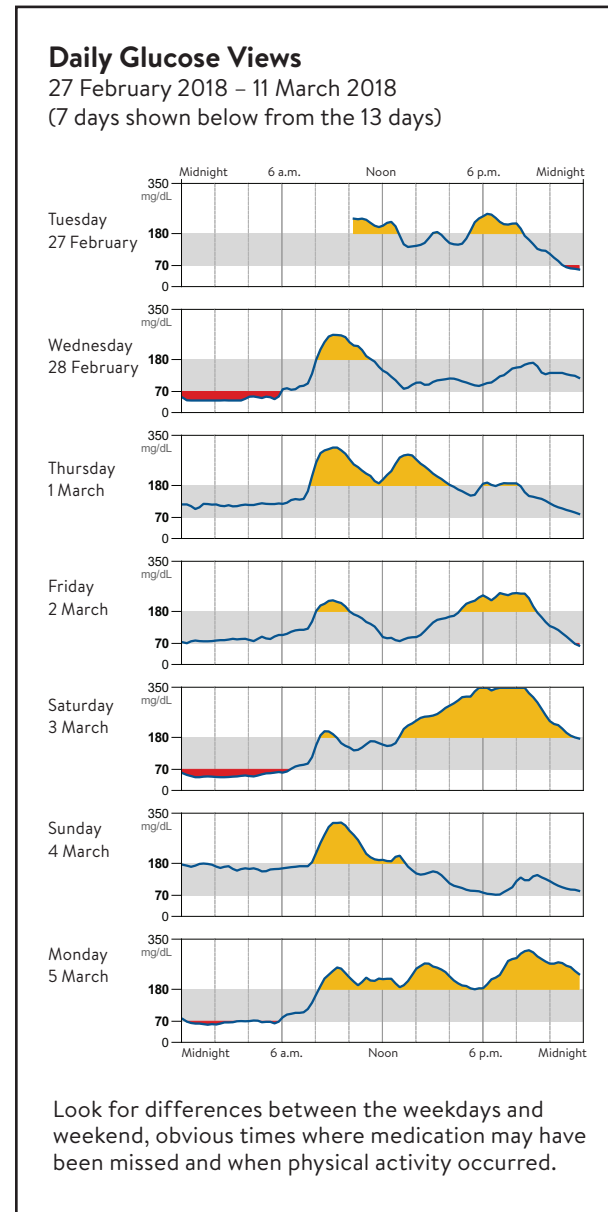
Step 8: Agree on an action plan with patient.
Recommend 1 or 2 next steps:

* Always treat hypoglycemia first.

* When treating a pattern of hyperglycemia, look at least 12 to 18 hours beyond the time of hyperglycemia you plan to treat. If glucose levels are 70 mg/dL or lower, be conservative or wait to treat the hyperglycemia until the hypoglycemia is corrected.

Step 9: Wrap up and document patient visit.
Give patient a copy of the AGP with written notes. Make sure patient understands follow-up plan of when to call their diabetes care team if concerns arise and when to schedule next appointment. To document, scan or snip AGP into patient's EMR.

Daily Glucose Views
27 February 2018 – 11 March 2018
(7 days shown below from the 13 days)

Look for differences between the weekdays and weekend, obvious times where medication may have been missed and when physical activity occurred.

Tips for Adjusting Diabetes Treatment

* Encourage lifestyle changes in addition to changes in medication. Consider referral for diabetes education.

* For patterns of low glucose, adjust sulfonylurea or insulin. Ensure adequate carbohydrate for activity or alcohol intake.

* For patterns of high glucose, consider missed medication, timing of insulin, illness and excess carbohydrate intake.

* See **AGPreport.org** for more information on interpreting an AGP.

Adapted from Carlson AL, Mullen DB, Bergenstal RM. Clinical Use of Continuous Glucose Monitoring in Adults with Type 2 Diabetes. *Diabetes Technology & Therapeutics* 2017;19(Suppl 2):S4–S11.

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