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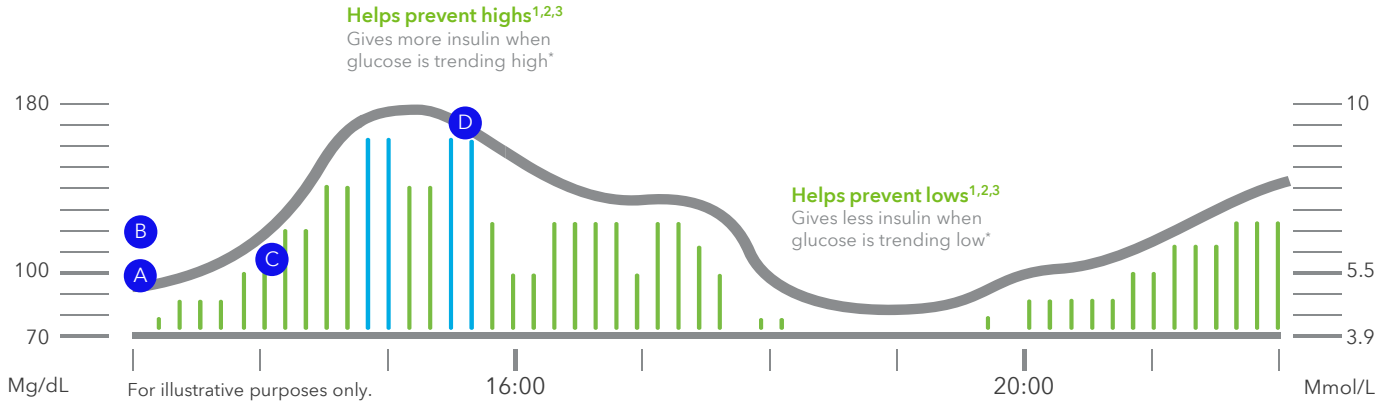
Engineering the extraordinary

MiniMed™ 780G system automatically adjusts* and corrects glucose levels every 5 minutes, as needed

SmartGuard™ technology helps prevent highs and lows[1,2,3]

Auto basal + Auto corrections



Auto corrects highs early, before they occur [1,2,3]

Adjusted, small auto correction dosing, up to every 5 minutes*

A Selection between a basal target of 5.5mmol/L (default setting), 6.1 mmol/L or 6.7mmol/L

B The auto correction target is set at 6.7 mmol/L

C Basal insulin adjusts every 5 minutes based on SG values

D Auto corrections delivered if the algorithm determines they are needed, and can be as frequent as every 5 minutes:
- Max basal reached
- SG ≥ 6.7mmol/L

No automatic corrections if Temp Target is set

- Refer to System User Guide - SmartGuard™ feature. Some user interaction required.

1. Carlson AL, et al. Diabetes Technol Ther. 2022;24(3):178-189.
2. Arrieta A, et al. Diabetes Obes Metab. 2022;24(7):1370-1379.
3. Collyns OJ, et al. Diabetes Care. 2021;44(4):969-975.

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Background

Meal boluses are the main reason for post-prandial hypoglycaemia. The higher the insulin dose, the more risk of hypoglycaemia – even with a large meal[1]

The MiniMed™ 780G system is outfitted with several modules for safety and efficacy.

- Safety of the MiniMed™ 780G algorithm for prevention of post meal and post correction bolus hypoglycaemia with safe meal bolus and the safe correction bolus.
- Efficiency of the algorithm in reducing post-meal hyperglycaemia with the meal detection feature which is built into the safe correction bolus algorithm.

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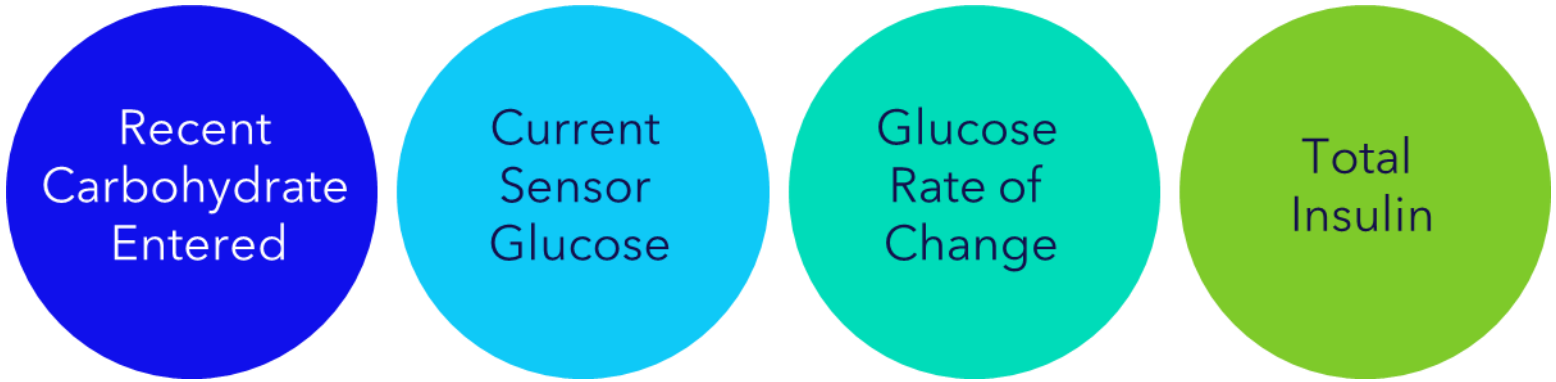
Safe meal bolus module

Safe meal bolus is a safety feature in the MiniMed™ 780G system that will reduce the amount of meal bolus insulin if the system predicts a hypoglycaemia would occur if the full bolus was given.

- Each time carbohydrates are entered into the SmartGuard™ bolus feature, the meal bolus is evaluated by the safe meal bolus feature.
- The safe meal bolus is a dynamic process to determine the meal bolus.

The SmartGuard™ safe meal bolus feature is using:



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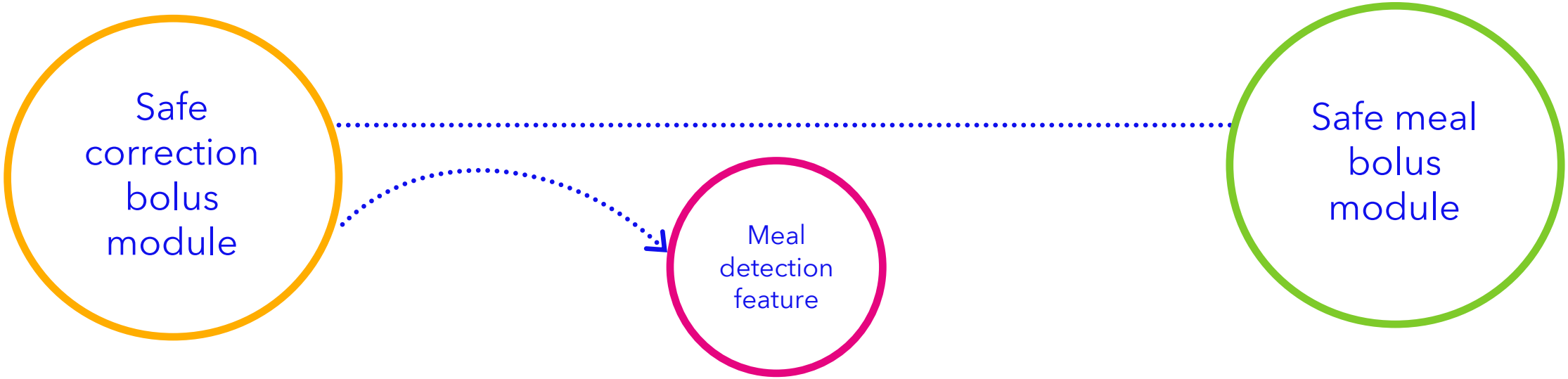
Safe bolus modules- brief overview



Safe correction bolus module

The system targets 6.7 mmol/L for corrections and uses a model-based prediction to estimate if a correction bolus will result in a glucose of less than 4.4 mmol/L in the next 2 hours. Does not account for carbohydrates.

Meal detection feature

It uses the past few sensor glucose slopes to detect rise in glucose based on duration, acceleration, consistency, and steepness of the rise. If a meal is detected, auto correction boluses are allowed to be more aggressive.

Safe meal bolus module

Similar prediction method as safe correction bolus module. Adds estimated effect of carbohydrate on glucose. Estimate lowest glucose within 4-hour window with the original meal bolus. It predicts the risk of post prandial hypoglycaemia and if necessary, reduces the meal bolus to avoid low glucose post meal.

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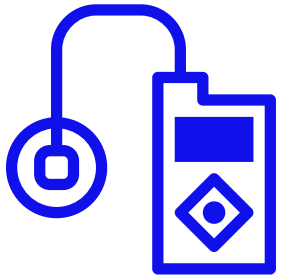
Safe meal bolus

Why is this occuring



- The safe meal bolus provides extra protection against hypoglycaemia
- Users may not be aware of auto-correction insulin or falling SG rate of change when delivering a meal bolus.
- Safe meal bolus is important because you may have more insulin in your system prior to meals as a result of automatic correction boluses.
- If the bolus isn't enough for the meal and glucose begins to rise, the pump can deliver automated insulin.
- The algorithm is programmed to prevent the need for preventive or "defensive" eating/carbohydrate ingestion.

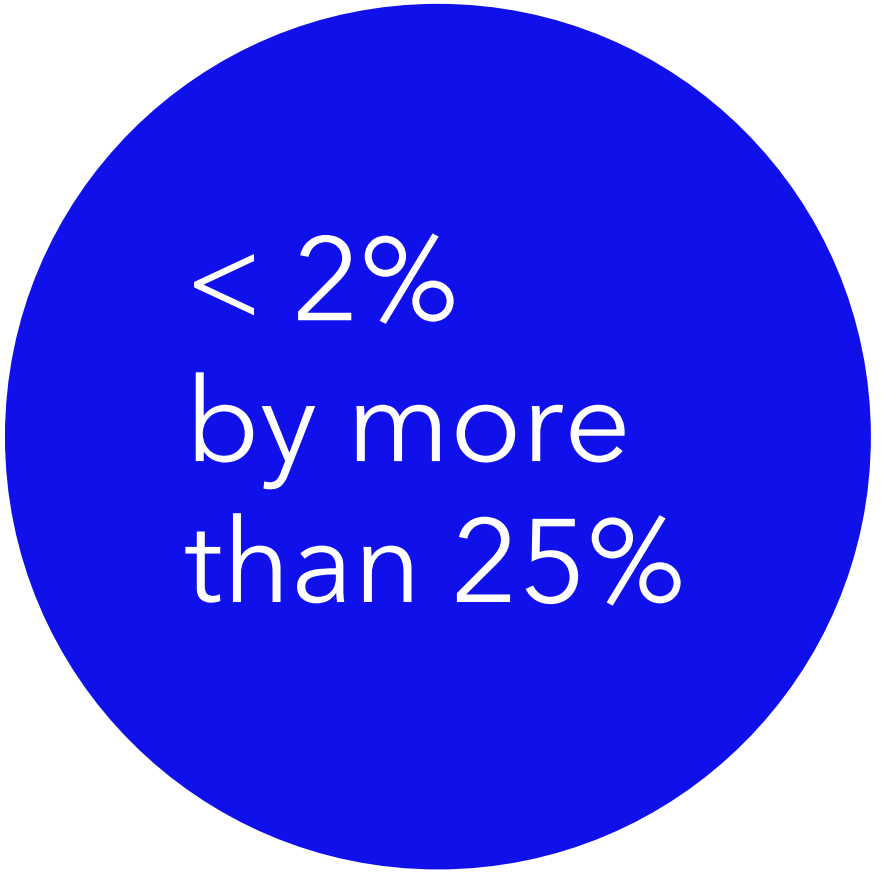
Safe meal bolus

How often is this occuring

Rare occurrence?

Beside the common reasons for glucose rising post-meal (mistimed, miscalculated etc.), it can happen that the post-prandial glucose rise is caused by a bolus reduction of the safe meal bolus

- **Based on real-world data[3], in less than 2% the bolus is reduced by more than 25%.**



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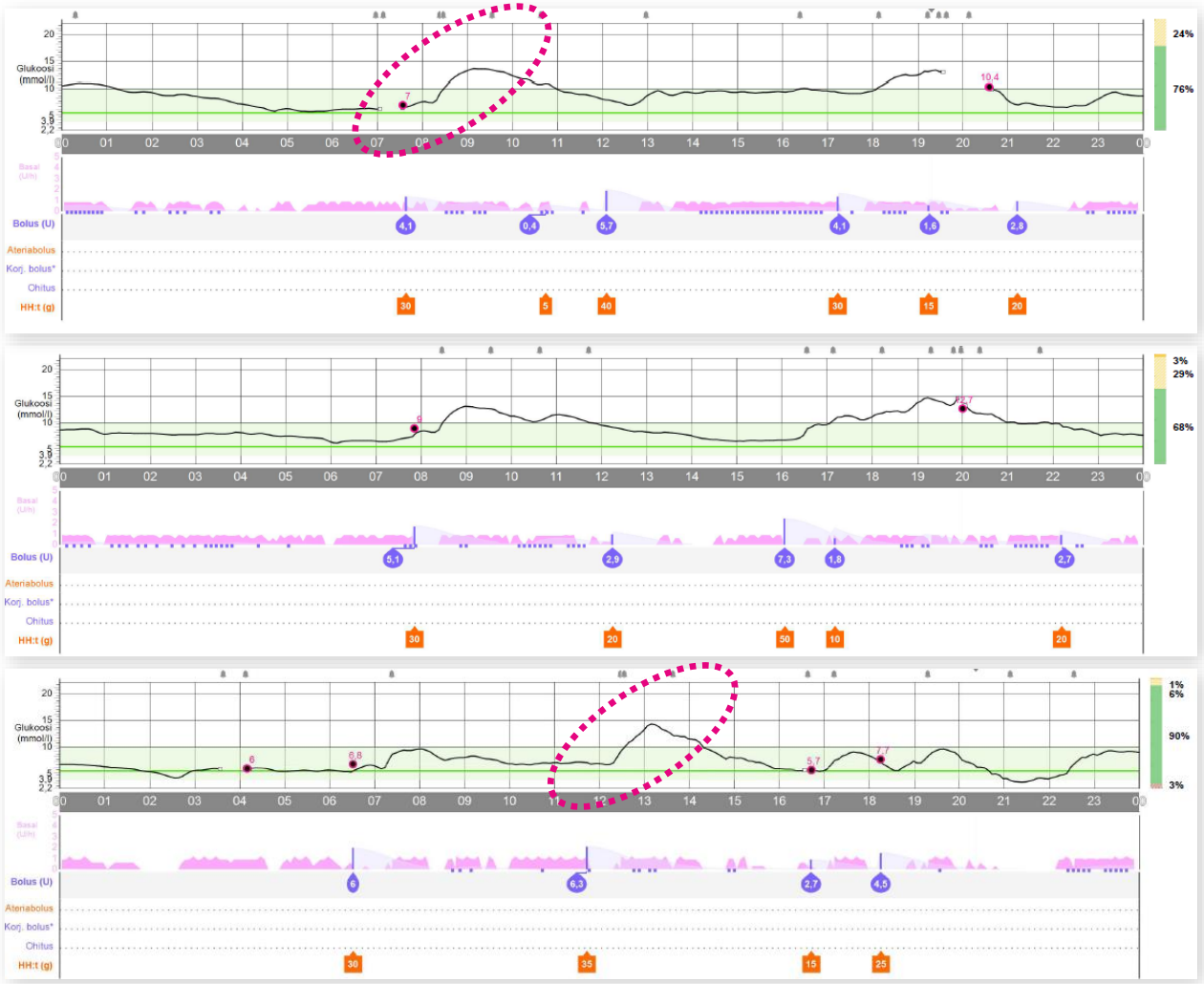
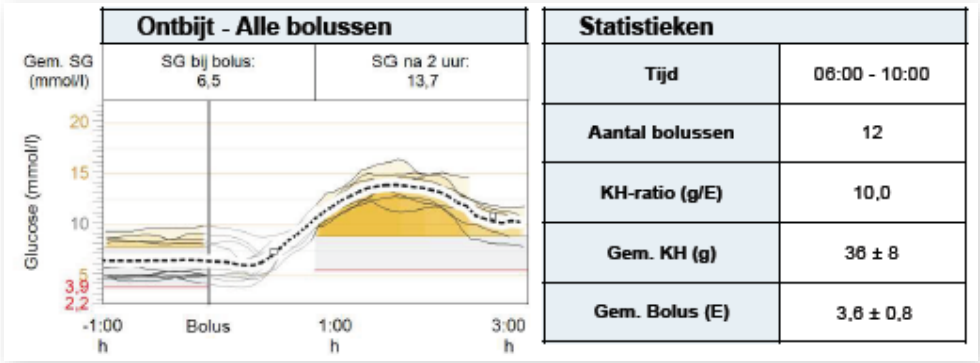
Safe meal bolus

Post prandial glucose rise?

1. Encourage patients to avoid focusing on single meals (most experience higher TIR, less TBR than previous therapy). Look at the “big picture” and the avoidance of the need for defensive eating.
2. Check the pump settings (AIT 2 hours, Target 5.5 mmol/L) and assure the max bolus is adequately set.
3. Assess bolus timing.
4. Optimise ICR as this is most impactful. (Ensure max bolus allows for ample bolus).
5. Ensure carbohydrate are entered and/or consume fewer carbohydrate. Generous carb estimates, individualised for patients, can assist once ICR is maximised according to the patient's experience.
6. Consider reduction in carb content and increase in proteins for recurrent issue.
7. If still no improvement, enter generous carbohydrate of 20-30% extra carbohydrate and adjust from there.

Case: Glucose rising post-meal





Statistieken	
Tijd	06:00 - 10:00
Aantal bolussen	12
KH-ratio (g/E)	10,0
Gem. KH (g)	36 ± 8
Gem. Bolus (E)	3,6 ± 0,8

Most common reasons

- Insulin-to-carb ratio (ICR) not adequate?
- Bolus timing?
  - Check if there is already a pre-meal glucose rise
    → consider earlier timing of bolus
- Carb counting issues?
- Bolus omitted?

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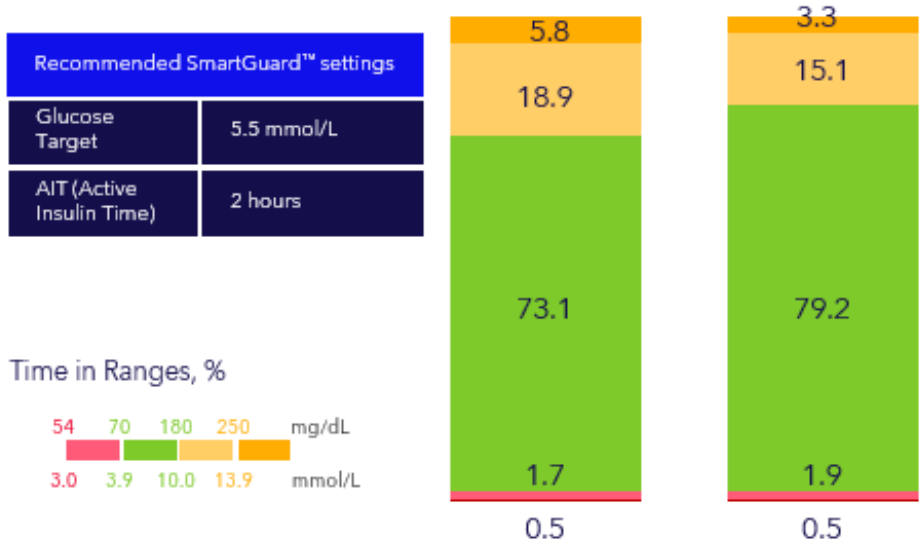
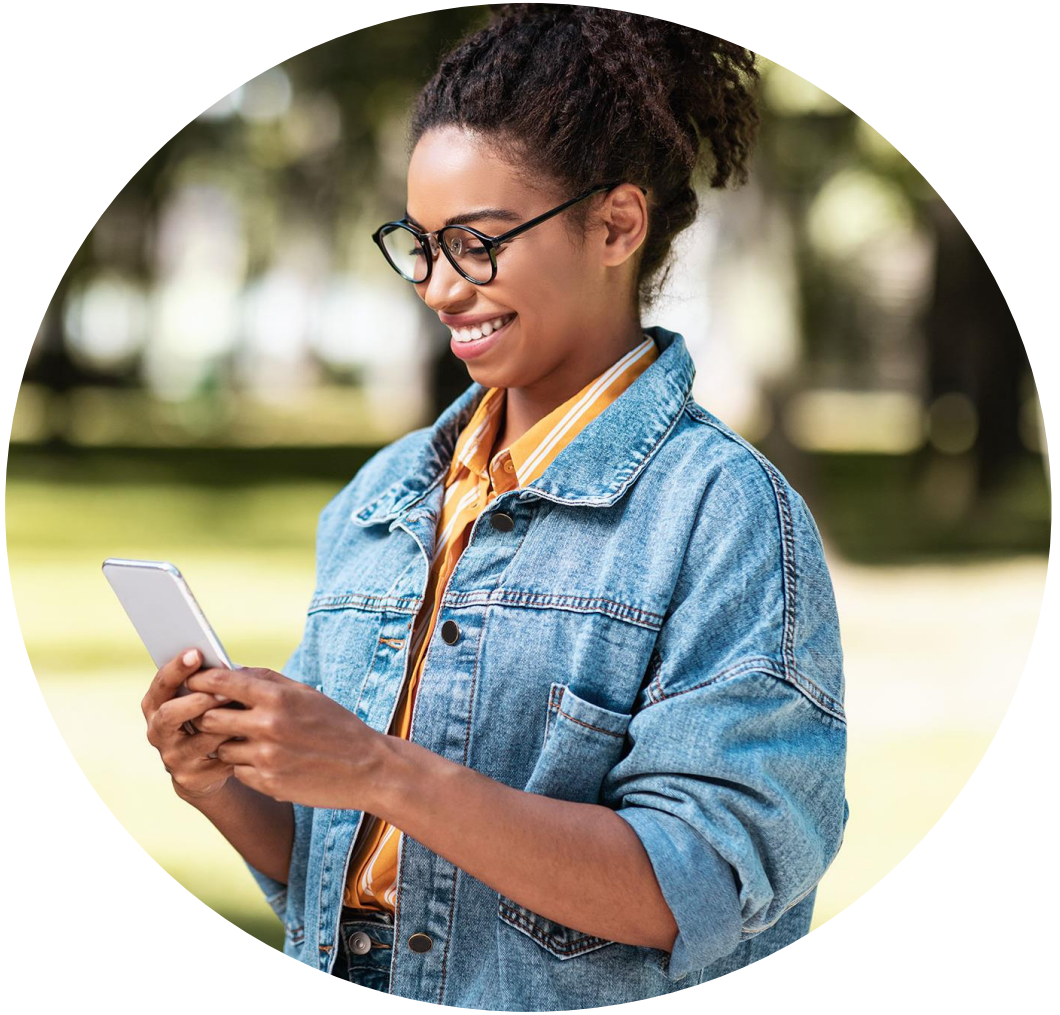
Recommended optimal settings* for better outcomes[1]

In the real-world evidence

	All users	Recommended optimal setting users*
Number of users, n	61,481	4,392
Time in SmartGuard™, %	90.0	94.1
Mean SG, mmol/L	8.4	7.8
GMI**, %	6.9	6.7





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1. Medtronic data on file: MiniMed ™ 780G data uploaded voluntarily by 61,481 users in EMEA to CareLink™ Personal, from August 2020 to dec 2022.

*Users with recommended optimal settings are the ones using the combination of glucose target setting at 100 mg/dL and Active Insulin Time (AIT) at 2 hours for at least 95% of the time.

Safe meal bolus

Takeaway messages

- The algorithm is designed to keep patients safe by protecting against hypoglycaemia.
- The safe meal bolus will assist in reducing hypoglycaemia.
- Safe meal bolus is a dynamic process to determine the meal bolus.
- Trust the algorithm as it considers multiple factors. However, glucose spikes may occur but try not to focus on single meals.
- Focus on the big picture - more TIR, less TBR.
- Auto corrections help to lower glucose back into range.

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Safe meal bolus

Takeaway messages

- To further mitigate post meal highs, assess the pump setting, try optimising ICR.
- Max bolus may need to be increased to allow for larger bolus.
- If the safe meal bolus feature is reducing the bolus size and post meal highs result, ensure carbohydrate are entered and/or consume fewer carbohydrate.
- Generous carb estimates, individualised for patients, can assist once ICR is maximised according to the patient's experience. For example, start by increasing carb count by 20-30%.

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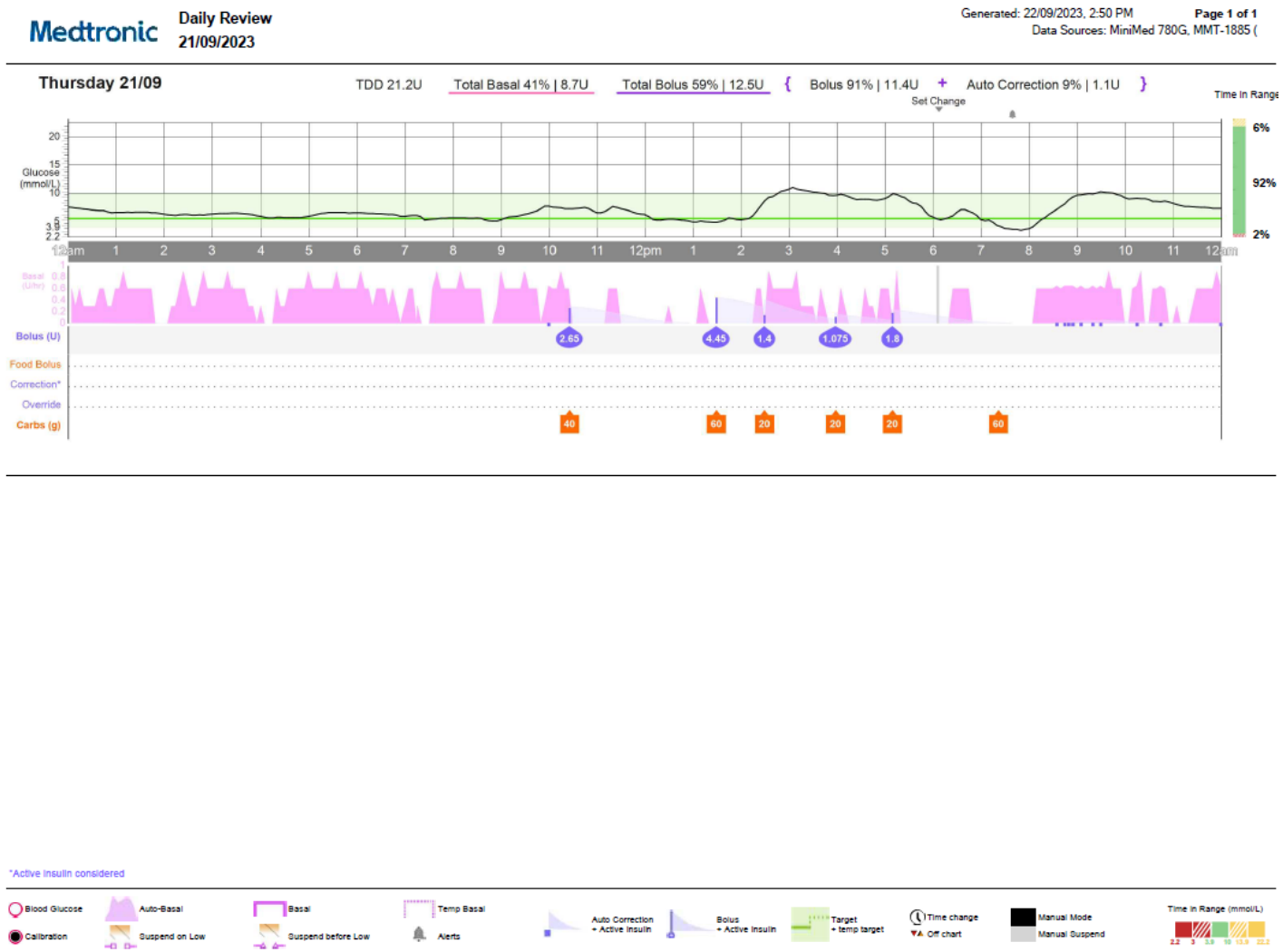
Example of Safe Meal Bolus



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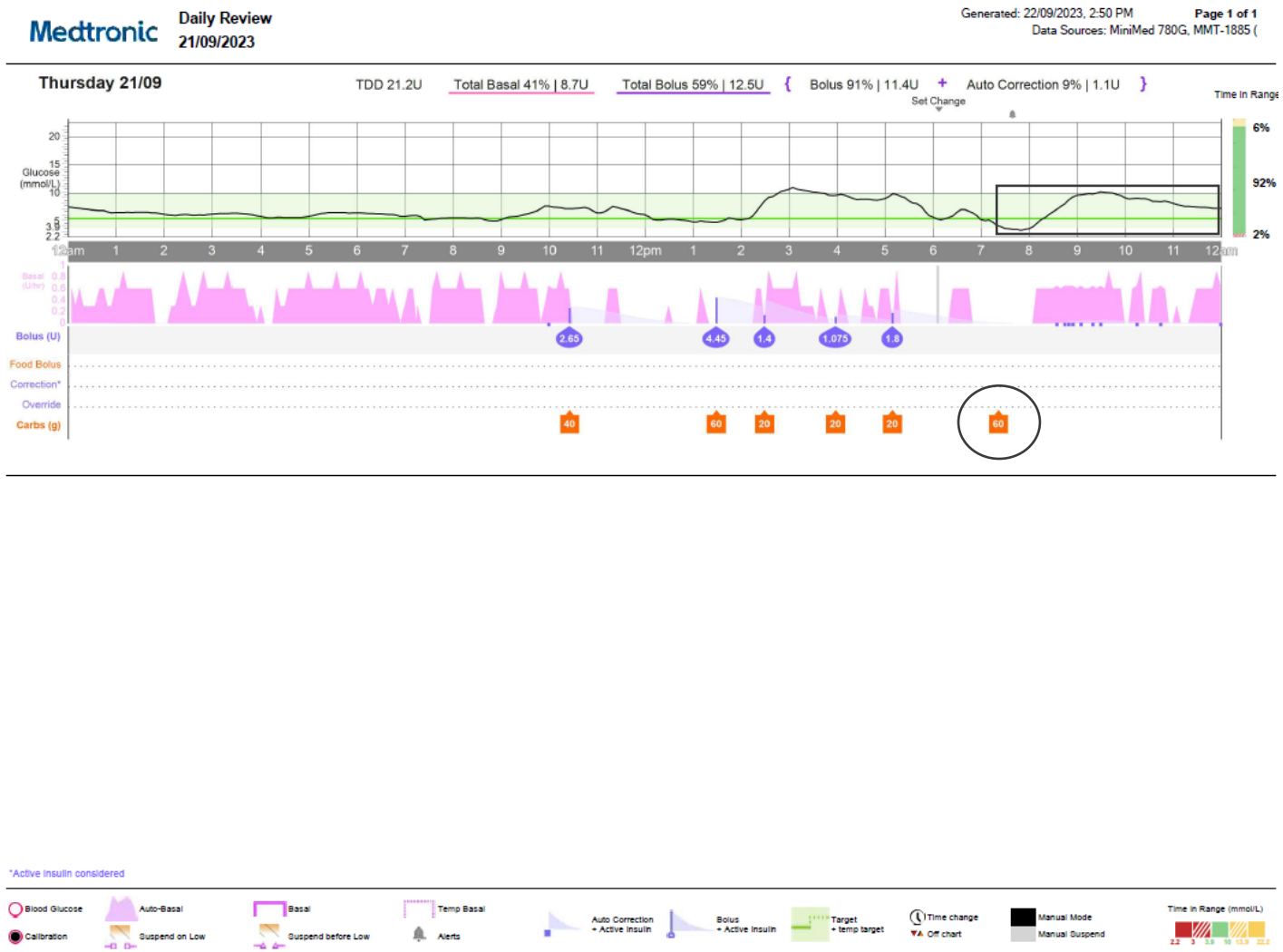
Example of Safe Meal Bolus



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SmartGuard™ feature
Bolus timing – General recommendations

- Bolusing before meal is key to maximising time in SmartGuard™ Feature
- Deliver your bolus 10-20 minutes before eating, whether in SmartGuard™ Feature or Manual Mode

What can happen if a bolus is delivered during or after your meal?

- Glucose will begin to rise before the bolus is given
- Auto Basal will begin to increase, and Auto Corrections will be delivered, in an attempt to return glucose to your target
- Bolusing during or after meal can increase the risk for
  - high glucose values after the meal and/or
  - high glucose values followed by a precipitous drop in glucose

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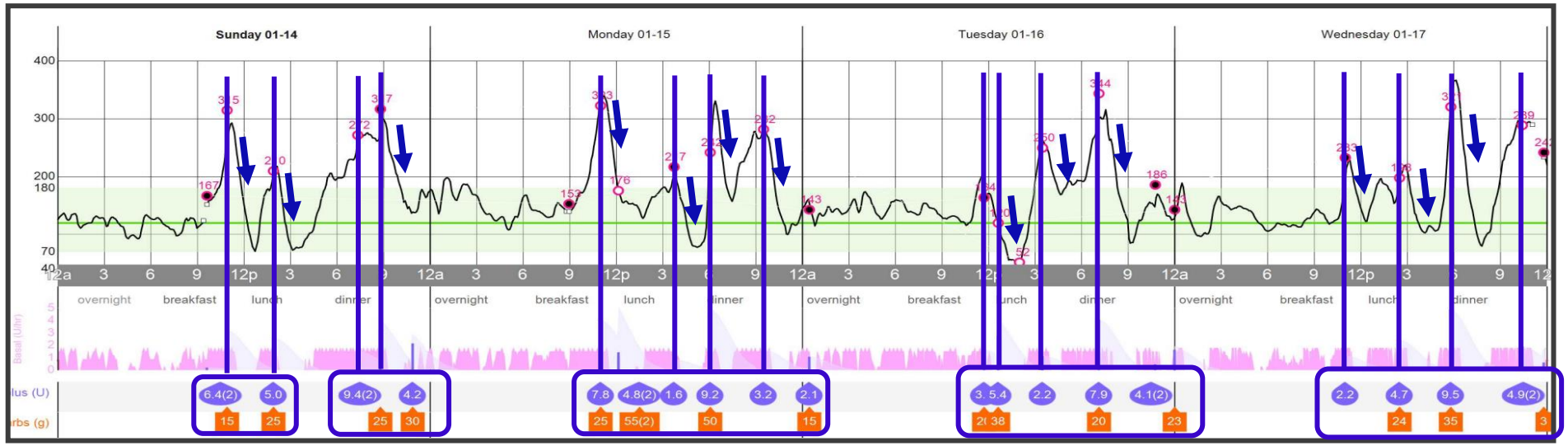
SmartGuard™ feature
Bolus timing: Real life example



- User eats before bolusing
  - Result: A sharp rise in sensor glucose (SG)
    Auto Basal increase
- Carbs entered & bolus given mid to post - meal /snack
  - Result: A sharp drop in SG
    SG often goes low to near-low "YO-YO" effect

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SmartGuard™ feature
Bolus timing in other situations

Underestimating carbs

- Enter and bolus for additional carbs at the end of the meal.
- If > 1 hour since eating, enter current BG and give the system recommended correction bolus

Unsure of how much will be eaten

- Enter and bolus pre-meal for the grams that you certain will eat
- If additional grams are consumed, enter carbs and bolus for additional grams as eaten

Missing a bolus

- If ≤ 1 hour after eating, enter half the grams eaten and recheck BG in an hour
  - If glucose is still high, enter current BG and give the system recommended correction bolus
- If > 1 hour after eating, enter the BG and give the system recommended correction bolus.

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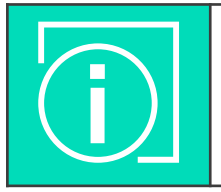
Meals high in fat and protein
How to bolus when in SmartGuard™ feature

- With usual pump therapy or in Manual Mode with the MiniMed™ 780G System you are able to use bolus options to match the insulin timing with the effect of the meal on your glucose level
- When in SmartGuard™ Feature, the algorithm adjusts in real-time to compensate for small miscalculations in carbs, high-fat meals, and delayed digestion.
- You may need less insulin for meals rich in fat and protein because of the slower digestion of carbs
- The MiniMed™ 780G System will use the Insulin-Carb-Ratio (ICR) from your Bolus Wizard™ settings to calculate the bolus
  - You only need to enter BG and carbs
- Keep in mind, dosing adjustments are conservative and not intended to correct for large mismatches in carbs or a missed bolus



Basal delivery is adjusted based on rise or fall of glucose.

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SmartGuard™ feature
Bolusing for high fat / high protein meals

Please note:

- Auto Basal can usually accommodate glucose fluctuations associated with high fat / high protein meals
- Dual Wave™ and Square Wave™ boluses are not available in SmartGuard™ Feature

If high glucose values do occur:

- Suggest entering 50%-75% of grams before eating and entering the remainder 1-2 hours after the meal
- Depending on meal composition, some people may require the majority of carbs to be entered before eating, with additional grams added later to compensate for the high fat content and slow digestion of the meal

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MiniMed™ 780G system with SmartGuard™ feature helps to simplify your patients' exercise[1]

Exercise duration

-120 min prior | -60 min | -15 min | 0 min | 45 min | 60 min

Temp Target duration

Start Temp Target
Between 60 – 120 min prior to exercise

Supplemental Carbs, if required

If <5.0 mmol/L: 10-20g carbs
If 5.0 – 6.9 mmol/L): 10g carbs

Aerobic exercise 45 min
If low, eat carbs but don't overtreat

Stop Temp Target
Between 0 - 15 mins after end of exercise

Don't exercise if glucose <3.9 mmol/L or >15.0 mmol/L or Ketosis 1.5 mmol/L

Post-Exercise Meal
Usual bolus or slight reduction (<25%)

A TEMPORARY TARGET (TEMP TARGET) of 8.3 mmol/L can be set for high activity situations such as exercise.

THE AUTO CORRECTION feature is inactive during an active temp target. It resumes after the temp target completes.

1. Lee et al. Diabetes Care. Volume 43, February 2020 480-483
This representation provides guidelines . Consult with your healthcare professional on how to manage exercise with your device.

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Low glucose

How to treat when using SmartGuard™

Smaller amounts of carbohydrate are generally needed due to the reduction or suspension of insulin delivery before the onset of hypoglycaemia.[3]
Half of your usual treatment is usually a good starting point.[4]

Check glucose in 15 minutes

Repeat treatment if glucose still below 3.9 mmol/L

Information contained herein does not replace the recommendations of your healthcare professional.

Simplified Meal Management

Delivers proven clinical outcomes in a wide T1D population*

Improvements in TIR were significantly **higher with flex** compared to simplified meal announcement, but **HbA1c and mean SG** were **comparable**

The AHCL algorithm is capable of overcoming **lower precision** in carb counting

Fix group reached international **targets of glycaemic control**

Meal management with precise carbohydrate counting further improves outcomes, **carbohydrate estimation skills remain important**

*The MiniMed™ 780G insulin pump is indicated for use by patients aged 7-80 years with Type 1 diabetes

1. Petrovski G, et al. Diabetes Care 2023;46(3):544–550

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Q&A

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References

1. Slattery D, et al. Optimal prandial timing of bolus insulin in diabetes management: a review. Diabet. Med. 2018; 35: 306-316
2. Castañeda J, Mathieu C, Aanstoot HJ, Arrieta A, Da Silva J, Shin J, Cohen O. Predictors of time in target glucose range in real-world users of the MiniMed 780G system. Diabetes Obes Metab. 2022 Nov;24(11):2212-2221. doi: 10.1111/dom.14807. Epub 2022 Aug 1. PMID: 35791621
3. MiniMed™ 780G data uploaded voluntarily by 2944 users in EMEA to CareLink™ Personal, from 27 August 2020 to 11 January 2021

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Disclaimer

MiniMed™ 780G system

This material does not replace or supersede the instructions for use. It should not be considered the exclusive source of information and should be used in conjunction with the User Guide.
See the User Guide for detailed information regarding the instructions for use, indications, contraindications, warnings, precautions, and potential adverse events. For further information, contact your local Medtronic representative and/or consult the Medtronic website at *Medtronic diabetes*

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