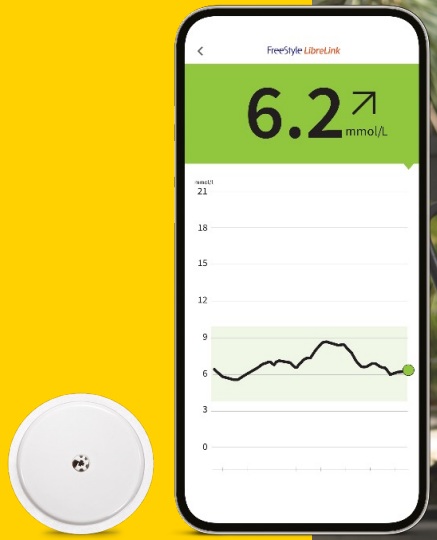
FreeStyle Libre 2

Case study

Case study: Marie



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Abbott

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Case study: Marie

FreeStyle Libre 2

Age	68	**BMI**	21 kg/m^2
Diabetes (Type)	Type 1 diabetes	**Last HbA1c value**	65.0 mmol/mol (8.1%)
Profession	Retired teacher	**Target glucose range**	3.9–10 mmol/L
Duration of diabetes	13 years	**Treatment**	Basal-bolus insulin therapy

Summary

Marie has had Type 1 diabetes for the last 13 years and her HbA1c level is 8.1% (65.0 mmol/mol) and indicative of poor glucose control. She feels concerned and wants to reduce her HbA1c levels. She is on CSII pump therapy.

Comorbidities

Arterial hypertension, neuropathy.

Specific objective

To reduce Marie's HbA1c level and maintain a steady glucose control.

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Case study: Marie

FreeStyle Libre 2

AGP Report

11 October 2021 - 24 October 2021 (14 Days)

LibreView

GLUCOSE STATISTICS AND TARGETS

11 October 2021 - 24 October 2021	14 Days
% Time Sensor is Active	100%

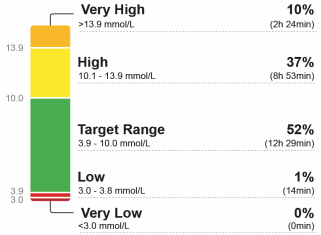
Ranges And Targets For	Type 1 or Type 2 Diabetes
Glucose Ranges	**Targets** % of Readings (Time/Day)
Target Range 3.9-10.0 mmol/L	Greater than 70% (16h 48min)
Below 3.9 mmol/L	Less than 4% (58min)
Below 3.0 mmol/L	Less than 1% (14min)
Above 10.0 mmol/L	Less than 25% (6h)
Above 13.9 mmol/L	Less than 5% (1h 12min)

Each 5% increase in time in range (3.9-10.0 mmol/L) is clinically beneficial.

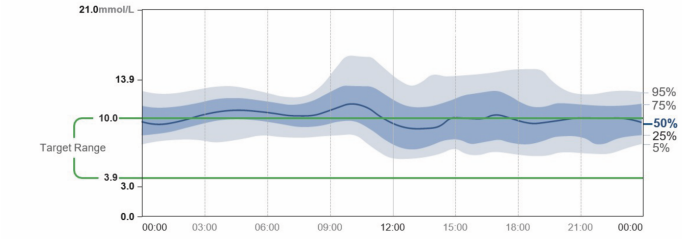
Average Glucose	9.9 mmol/L
Glucose Management Indicator (GMI)	7.8% or 62 mmol/mol
Glucose Variability	33.9%

Defined as percent coefficient of variation (%CV); target ≤36%

TIME IN RANGES



AMBULATORY GLUCOSE PROFILE (AGP)



Snapshot

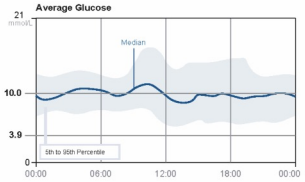
11 October 2021 - 24 October 2021 (14 Days)

LibreView

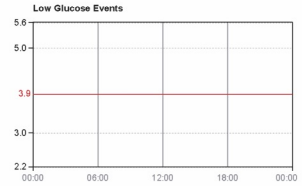
Glucose

GMI 7.8 % or 62 mmol/mol

AVERAGE GLUCOSE	9.9 mmol/L
% above target	47 %
% in target	52 %
% below target	1 %

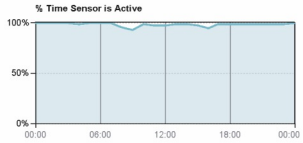


LOW GLUCOSE EVENTS	0
Average duration	0 Min



Sensor Usage

% TIME SENSOR IS ACTIVE	100 %
Average scans/views	24 / Day



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What does the 4-step review tell us?

FreeStyle Libre 2

STEP 1

Data capture and Time in Range (TIR)

Marie's sensor data capture is 100%, which gives us confidence in the outcomes in her AGP Report. Her Time in Range is 52%, which is good place to start.

STEP 2

Look for patterns of hypoglycaemia

Marie's time below range is only 1% and she has no low-glucose events recorded. Her blue and grey bands are not threatening her lower glucose target threshold, which means that she has a low risk of hypoglycaemia. No intervention is required at this stage.

STEP 3

Look for patterns of hyperglycaemia

Her AGP shows that Marie's average glucose is consistently at or just above the top of her target glucose range and 47% of her readings are above target. There is a lot of air under the clouds, particularly overnight and through the morning, so it should be possible to intensify her treatment without risk of hypoglycaemia.

STEP 4

Look for patterns of glucose variability

Marie's Time in Range is only 52% and could be improved. The day-to-day variability shown in her blue band is not a concern between 3:00am–8:00am, but both her blue and grey bands widen considerably from 10:00am, indicating significant glucose variability after this time. The expansive grey band from 10:00am to suggests that there are aspects of Marie's daily routine that needs to be addressed. Her CV is 33.9%, below the target of 36%, so her glucose variability is not a priority.

What actions might you agree with Marie?

- Her AGP profile indicates that Marie should be aware of the glucose irregularities during the day with the help of flash glucose monitoring.
- An increase in Marie's basal insulin rate in the afternoon and evening is recommended to improve her variability and also to reduce her hyperglycaemia overnight.
- Marie should increase her corrective insulin doses in the afternoon to bring her glucose into range.
- Discuss Marie's food habits and her daily routine to reduce the bulging grey band of occasional variability through the second half of the day.

Case study: Marie

FreeStyle Libre 2

AGP Report

LibreView

7 December 2021 - 20 December 2021 (14 Days)

GLUCOSE STATISTICS AND TARGETS

7 December 2021 - 20 December 2021	14 Days
% Time Sensor is Active	100%

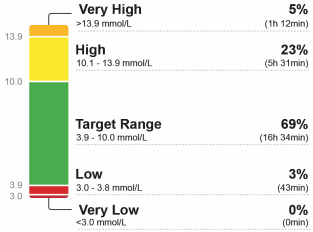
Ranges And Targets For	Type 1 or Type 2 Diabetes
Glucose Ranges Target Range 3.9-10.0 mmol/L	**Targets** % of Readings (Time/Day) Greater than 70% (16h 48min)
Below 3.9 mmol/L	Less than 4% (58min)
Below 3.0 mmol/L	Less than 1% (14min)
Above 10.0 mmol/L	Less than 25% (6h)
Above 13.9 mmol/L	Less than 5% (1h 12min)

Each 5% increase in time in range (3.9-10.0 mmol/L) is clinically beneficial.

Average Glucose	8.7 mmol/L
Glucose Management Indicator (GMI)	7.1% or 54 mmol/mol
Glucose Variability	33.6%

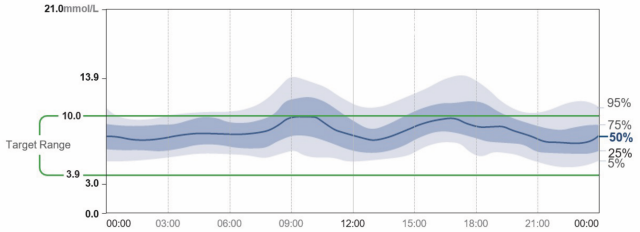
Defined as percent coefficient of variation (%CV); target ≤36%

TIME IN RANGES



Very High	>13.9 mmol/L	5% (1h 12min)
High	10.1 - 13.9 mmol/L	23% (5h 31min)
Target Range	3.9 - 10.0 mmol/L	69% (16h 34min)
Low	3.0 - 3.8 mmol/L	3% (43min)
Very Low	<3.0 mmol/L	0% (0min)

AMBULATORY GLUCOSE PROFILE (AGP)



Snapshot

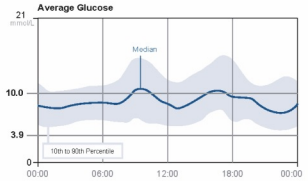
LibreView

7 December 2021 - 20 December 2021 (14 Days)

Glucose

GMI 7.1 % or 54 mmol/mol

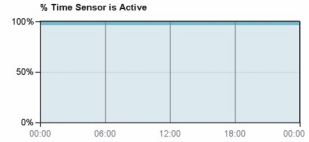
AVERAGE GLUCOSE	8.7 mmol/L
% above target	28 %
% in target	69 %
% below target	3 %



LOW GLUCOSE EVENTS	4
Average duration	60 Min

Sensor Usage

% TIME SENSOR IS ACTIVE	100 %
Average scans/views	21 / Day



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What does the 4-step review tell us?

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STEP 1

Data capture and Time in Range (TIR)

Marie's data capture is excellent at 100%, and she has increased her Time in Range to 69%, which should be praised.

STEP 2

Look for patterns of hypoglycaemia

Marie's median line and her blue and grey bands continue to remain well above 3.9 mmol/L which means that her risk of hypoglycaemic is not a concern. However, Marie has recorded a small number of low-glucose events, although none as low as 3.0 mmol/L and her grey band is wide and close to her lower target range between 9:00pm–midnight. This is worth keeping an eye on.

STEP 3

Look for patterns of hyperglycaemia

Marie's time above target has reduced substantially to 28% and her GMI has reduced from 7.8% (62 mmol/mol) to 7.1% (54 mmol/mol) by modifying her insulin doses. Marie's median glucose level is within her target range for most of the day, but she is experiencing some post-prandial rises after lunch and her evening meal, that are contributing to unwanted hyperglycaemia.

STEP 4

Look for patterns of glucose variability

Marie's time in range is good at 69% but there are wider blue and grey bands after breakfast and lunch. Her blue band is not too wide but Marie's grey band broadens after breakfast and through the afternoon. Her median line shows that post-prandial elevations are common but are not a cause for immediate concern, especially as her CV is below 36%.

What actions might you agree with Marie?

- No further changes in basal insulin is required, although she might consider increasing her prandial bolus insulin, to minimise excursions after lunch and dinner.
- Marie should pay attention to fast carbohydrates in morning and afternoons to avoid upward swings and improve postprandial glucose stability.