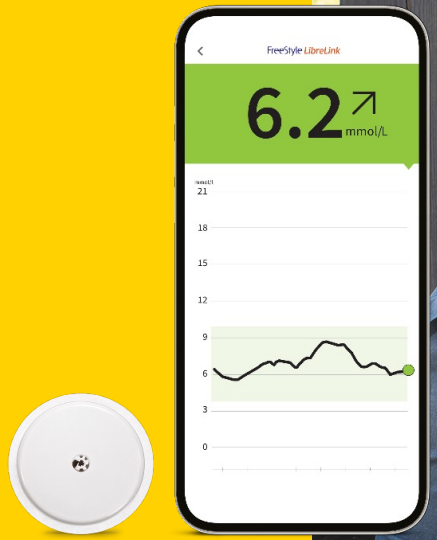
FreeStyle Libre 2

Case study

Case study: Harold



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Abbott

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Case study: Harold

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Age	83	**BMI**	32.5 kg/m^2
Diabetes (Type)	Type 2 diabetes	**Last HbA1c value**	49 mmol/mol (6.6%)
Profession	Retired	**Target glucose range**	3.9–10 mmol/L
Duration of diabetes	22 years	**Treatment**	Basal-bolus insulin therapy

Summary

Harold is an elderly gentleman, who enjoys pottering in his garden. He recently started insulin to improve his glycaemic control but complains of frequent episodes of hypoglycaemia.

Comorbidities

Obesity, hypertension, metabolic syndrome; currently prescribed simvastatin, amlodipine and telmisartan.

Specific objective

Reduce the frequency of hypoglycaemic episodes.

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Case study: Harold

FreeStyle Libre 2

AGP Report

7 July 2021 - 21 July 2021 (14 Days)

LibreView

GLUCOSE STATISTICS AND TARGETS

7 July 2021 - 21 July 2021 %	14 Days
Time Sensor is Active	98%

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)

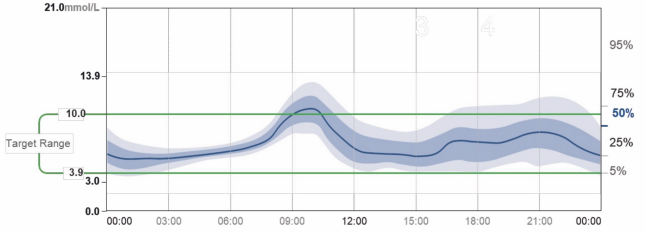
Each 5% increase in time in range (3.9-10.0 mmol/L) is clinically beneficial.

Average Glucose	6.9 mmol/L
Glucose Management Indicator (GMI)	6.0% or 42 mmol/mol
Glucose Variability	38.2%

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

TIME IN RANGES

AMBULATORY GLUCOSE PROFILE (AGP)



Snapshot

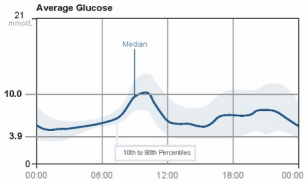
7 July 2021 - 21 July 2021 (14 Days)

LibreView

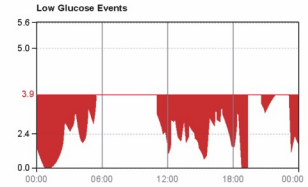
Glucose

GMI 6.0 % or 42 mmol/mol

AVERAGE GLUCOSE	6.9 mmol/L
% above target	19 %
% in target	75 %
% below target	6 %

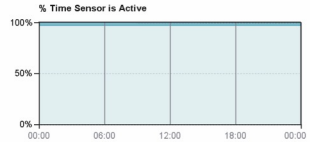


LOW GLUCOSE EVENTS	38
Average duration	98 Min



Sensor Usage

% TIME SENSOR IS ACTIVE	98 %
Average scans/views	13 / 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)

Harold is scanning regularly and has captured 98% of his sensor data. His Time in Range is currently 75%. A good place to start!

STEP 2

Look for patterns of hypoglycaemia

Although the blue **median line** in Harold's AGP Report is largely within the target range, there is a risk of hypoglycaemia seen by the dip in his blue shaded IQR band between midnight and 3:00am and his grey shaded band is also straying below his lower target range at this time. There is a similar pattern between noon and 6:00pm. Harold's **Snapshot report** shows that he is experiencing low glucose events overnight and through the afternoon, including some below 3.0 mmol/L.

STEP 3

Look for patterns of hyperglycaemia

Harold's AGP profile is fairly consistent, with episodes of hyperglycaemia after breakfast between 8:00am and noon, and from 4:00pm to midnight as indicated by his outer grey band. The consistent spike in his median line and IQR blue band in the late morning, suggests a change in his bolus insulin dose at breakfast may be required. However, it is also important to consider Harold's age and overall health when making treatment decisions.

STEP 4

Look for patterns of glucose variability

The blue and grey shaded bands in Harold's AGP Report widen as the day progresses from noon onwards, with more variation in glucose levels seen towards the late evening. His glycaemic variability as measured by a CV of 38.2%, confirms his risk of hypoglycaemia at this time of day.

What actions might you agree with Harold?

- It is important to consider Harold's age and lifestyle when making treatment decisions.
- A reduction in Harold's basal insulin dose of glargine 300 is recommended. This should reduce his trend to low glucose overnight.
- The timing and dose of Harold's prandial insulin at breakfast should be increased to avoid the upswing in glucose.

Case study: Harold

FreeStyle Libre 2

AGP Report

LibreView

9 November 2021 - 22 November 2021 (14 Days)

GLUCOSE STATISTICS AND TARGETS

9 November 2021 - 22 November 2021	14 Days
% Time Sensor is Active	100%

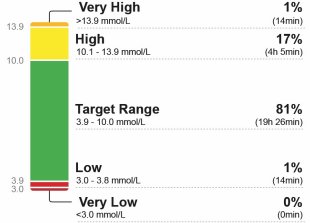
Ranges And Targets For	Type 1 or Type 2 Diabetes
Glucose Ranges Target Range 3.9-10.0 mmol/L	**Targets** % of Readings (Time/Day) Greater than 70% (16h 48min)
Below 3.9 mmol/L	Less than 4% (58min)
Below 3.0 mmol/L	Less than 1% (14min)
Above 10.0 mmol/L	Less than 25% (6h)
Above 13.9 mmol/L	Less than 5%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

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

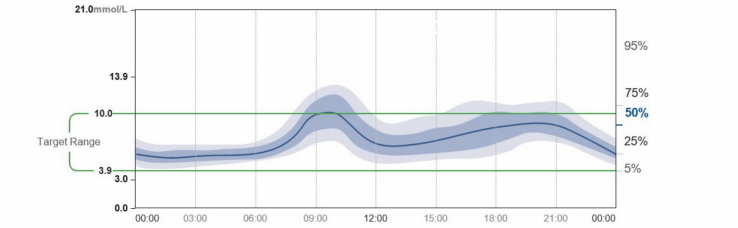
Average Glucose	7.7 mmol/L
Glucose Management Indicator (GMI)	6.5% or 48 mmol/mol
Glucose Variability	36.3%

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

TIME IN RANGES



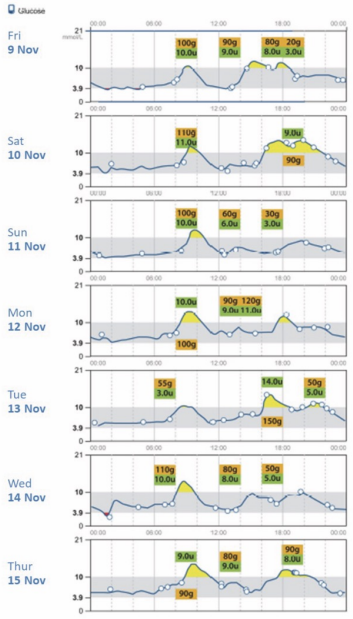
AMBULATORY GLUCOSE PROFILE (AGP)



Weekly Summary

LibreView

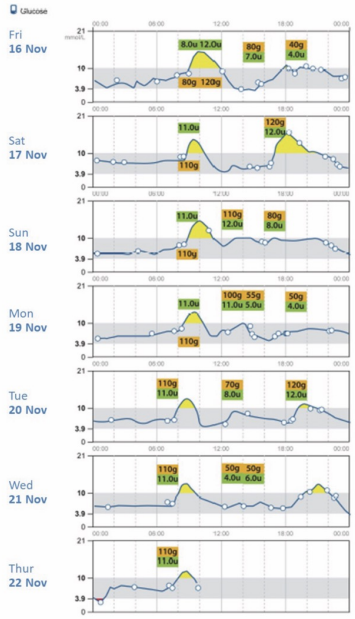
9 November 2021 -22 November 2021 (14 Days)



Weekly Summary

LibreView

9 November 2021 -22 November 2021 (14 Days)



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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)

Harold's Time in Range is now 81%, and his data capture is 100%, both excellent results. Harold can be congratulated for these achievements.

STEP 2

Look for patterns of hypoglycaemia

There is still a small risk of hypoglycaemia overnight in the afternoon, but Harold's **Weekly Summary** report does not show any cause for concern, although two brief excursions below 3.9 mmol/L are evident. Any risk may be addressed by a further reduction in bolus insulin taken in the evening. Harold is diligent at logging insulin doses and carbohydrate content of his meals, which can help in making adjustments to his glucose management.

STEP 3

Look for patterns of hyperglycaemia

There is still a spike in glucose levels after breakfast in the morning and this continues to be a feature of Harold's daily profiles as revealed in his **Weekly Summary** reports. This could be addressed by another adjustment to the bolus insulin taken at breakfast.

STEP 4

Look for patterns of glucose variability

The shaded blue and grey bands in Harold's AGP reveal the same pattern of glucose variability across the day, although it is reduced from 38.3% to 36.3%. Any concerns about glycaemic variability are linked to his risk for low glucose events.

What actions might you agree with Harold?

- Harold's bolus insulin in the evening should be further reduced to minimise the risk of hypoglycaemia overnight.
- His bolus insulin at breakfast should be increased to address the spike seen mid-morning.
- It is important to consider the patient's age and general health when making treatment decisions; safety and quality of life should be the most important factors for Harold.