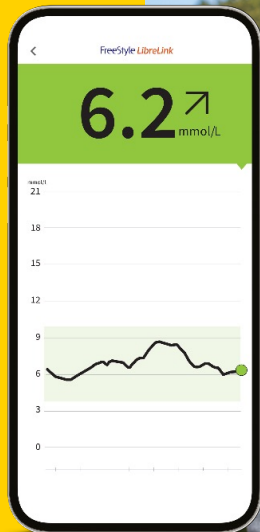




FreeStyle  
Libre 2

# Case study: Michael

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Case study



# Case study: Michael

<b>Age</b>	28	<b>BMI</b>	28.7 kg/m <sup>2</sup>
<b>Diabetes (Type)</b>	Type 1 diabetes	<b>Last HbA1c value</b>	66.0 mmol/mol (8.2%)
<b>Profession</b>	Bricklayer	<b>Target glucose range</b>	3.9–10 mmol/L
<b>Duration of diabetes</b>	22 years	<b>Treatment</b>	Basal-bolus insulin therapy



## Summary

Michael works as a bricklayer, with periods of intense activity, making it difficult to judge insulin requirements. He regularly has episodes of hypoglycaemia and would like to have more control over his diabetes and have a 'normal' life like his mates.



## Comorbidities

Peripheral neuropathy.



## Specific objective

Understanding how to identify and address episodes of hypoglycaemia and improving Time in Range.

# Case study: Michael

## AGP Report

17 October 2021 - 30 October 2021 (14 Days)

### GLUCOSE STATISTICS AND TARGETS

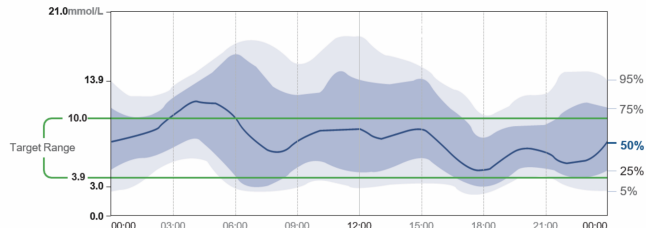
17 October 2021 - 30 October 2021 **14 Days**  
 % Time Sensor is Active **79%**

Ranges And Targets For	Type 1 or Type 2 Diabetes
<b>Glucose Ranges</b>	<b>Targets % of Readings (Time/Day)</b>
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.

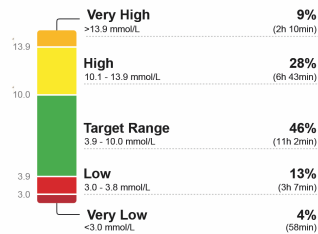
**Average Glucose** **8.7 mmol/L**  
**Glucose Management Indicator (GMI)** **7.1% or 54 mmol/mol**  
**Glucose Variability** **44.3%**  
 Defined as percent coefficient of variation (%CV); target ≤36%

### AMBULATORY GLUCOSE PROFILE (AGP)



## LibreView

### TIME IN RANGES



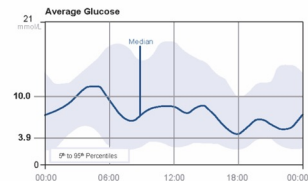
## Snapshot

17 October 2021 - 30 October 2021 (14 Days)

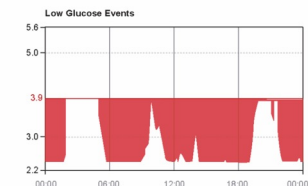
### Glucose

GMI **7.1%** or **54 mmol/mol**

**AVERAGE GLUCOSE** **8.7 mmol/L**  
 % above target **37%**  
 % in target **46%**  
 % below target **17%**

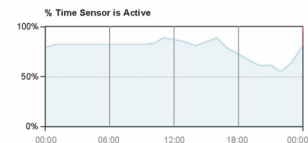


**LOW GLUCOSE EVENTS** **27**  
 Average duration **131 min**



### Sensor Usage

**% TIME SENSOR IS ACTIVE** **79%**  
 Average scans/Views **9 / Day**

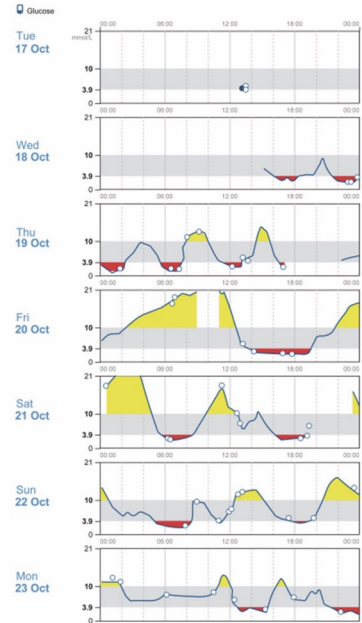


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# Case study: Michael

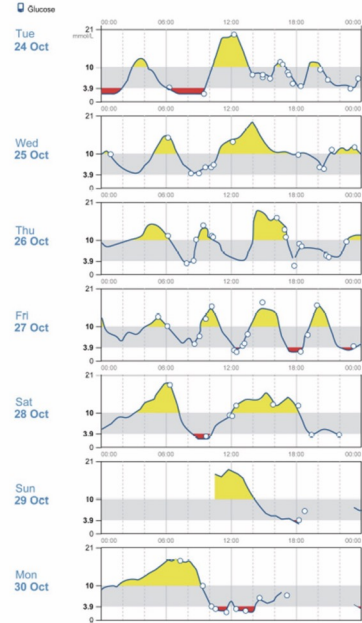
## Weekly Summary LibreView

17 October 2021 - 30 October 2021 (14 Days)



## Weekly Summary LibreView

17 October 2021 - 30 October 2021 (14 Days)



Images are for illustrative purposes only. Not actual patient data.

# What does this 4-step review tell us?

## STEP 1

### Data capture and Time in Range (TIR)

Michael's data capture is 79%, enough for a confident review of his AGP Report and his Time in Range is 46%, which is below the recommended consensus target of above 70%.

## STEP 2

### Look for patterns of hypoglycaemia

There are significant periods across the day where Michael is experiencing hypoglycaemia, as indicated by his blue and grey shaded bands reaching below 3.9 mmol/L between 6:00am-9:00am and 5:00pm-7:00pm, and also by the number of low glucose events in his **Snapshot report**, which confirm excursions below 3.0 mmol/L. His Time Below Range is 17%, with 4% of time below 3.0 mmol/L. This is a real priority for management. Michael may not be able to identify the signs of hypoglycaemia, so it may be beneficial to discuss these with him.

## STEP 3

### Look for patterns of hyperglycaemia

Michael's glucose levels tend to rise overnight and there is a spike of hyperglycaemia above 10 mmol/L as seen by the rise in the blue median line between 3:00am and 6:00am. His glucose levels are above his upper target range for 37% of time, with very high glucose above 13.9 mmol/L, 9% of the time. This chronic hyperglycaemia should be a focus for improvement.

## STEP 4

### Look for patterns of glucose variability

The blue and grey shaded bands in Michael's AGP are billowing throughout much of the day, indicating significant day-to-day glucose variability. The variation is particularly striking from 5:00am-5:00pm. His Time in Range is currently 46%, which should be increased. A look at Michael's daily glucose profiles in his **Weekly Summary** report shows that his glucose is on a rollercoaster most days. This suggests that Michael might not fully understand the relationship between his activities and food intake and using his insulin to counteract high glucose levels.

### What actions might you agree with Michael?

- Michael's mealtime insulin dosage and his correction factor between meals should be reduced to lessen his immediate risk of low glucose.
- Michael would benefit from up titrating his basal insulin dose to moderate the overnight rise in his glucose levels.
- He is also recommended to attend a structured education programme to understand better how his treatment parameters should be managed alongside his daily routines.

# Case study: Michael



## AGP Report

8 November 2021 - 21 November 2021 (14 Days)

LibreView

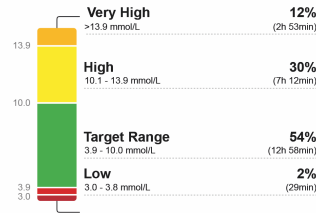
### GLUCOSE STATISTICS AND TARGETS

8 November 2021 - 21 November 2021 14 Days  
 % Time Sensor is Active 96%

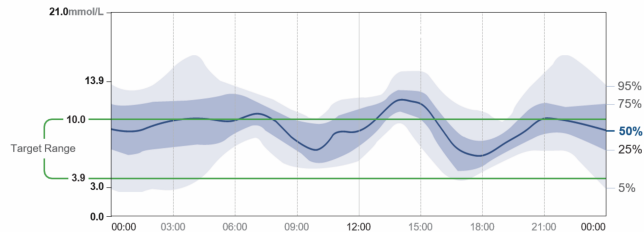
Ranges And Targets For	Type 1 or Type 2 Diabetes
<b>Glucose Ranges</b>	<b>Targets % of Readings (Time/Day)</b>
Target Range 3.9-10.0 mmol/L	Greater than 70% (16h 48min)
Below 3.9 mmol/L	Less than 4% (58min)
Below 3.0 mmol/L	Less than 1% (14min)
Above 10.0 mmol/L	Less than 25% (6h)
Above 13.9 mmol/L	Less than 5% (1h 12min)
Each 5% increase in time in range (3.9-10.0 mmol/L) is clinically beneficial.	

Average Glucose 9.4 mmol/L  
 Glucose Management Indicator (GMI) 7.5% or 58 mmol/mol  
 Glucose Variability 38.1%  
 Defined as percent coefficient of variation (%CV); target ≤36%

### TIME IN RANGES



### AMBULATORY GLUCOSE PROFILE (AGP)



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## Snapshot

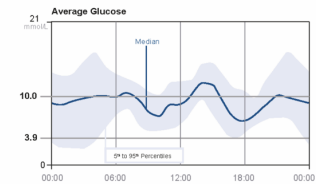
8 November 2021 - 21 November 2021 (14 Days)

LibreView

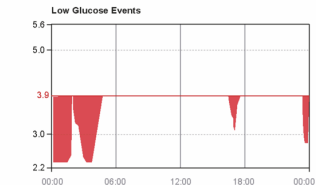
### Glucose

GMI 7.5% or 58 mmol/mol

AVERAGE GLUCOSE 9.4 mmol/L  
 % above target 42%  
 % in target 54%  
 % below target 4%

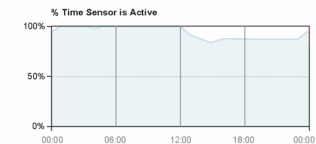


LOW GLUCOSE EVENTS 5  
 Average duration 92 min



### Sensor Usage

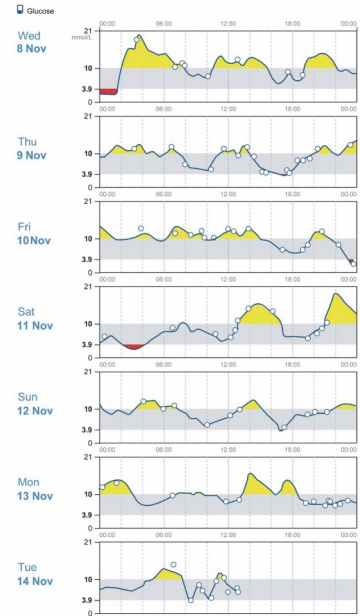
% TIME SENSOR IS ACTIVE 96%  
 Average scans/Views 12 / Day



# Case study: Michael

## Weekly Summary *LibreView*

8 November 2021 - 21 November 2021 (14 Days)



Images are for illustrative purposes only. Not actual patient data.

# What does this 4-step review tell us?

## STEP 1

### Data capture and Time in Range (TIR)

Michael's data capture is now 96%, and his Time in Range has increased to 54%. Congratulate Michael on the improvements made.

## STEP 2

### Look for patterns of hypoglycaemia

Although he has reduced his Time Below Range to 4%, a good result, his AGP and his low glucose events shown in his **Snapshot report** show that Michael still has a significant risk of low-glucose episodes overnight, including events below 3.0 mmol/L. There is also a significant dip in glucose levels in the late afternoon between 4:00pm and 6:00pm. These are important concerns.

## STEP 3

### Look for patterns of hyperglycaemia

42% of Michael's readings are now above 10 mmol/L, an increase from 37%. His median line and blue band show a significant excursion after midday, which may be addressed by increasing the prandial dose of insulin at lunchtime. Michael's overnight glucose shows a lot of variability above target, as shown in his blue and grey bands, which balloon from 10:00pm onwards.

## STEP 4

### Look for patterns of glucose variability

There is an improvement in the variability of Michael's glucose results, compared to the previous AGP, but it is still unstable (CV >36%). His blue and grey bands still show considerable variability, arising after the evening meal, that continues overnight. A look at the daily profiles in his **Weekly Summary** report confirms the continued glucose oscillation each day. These daily profiles and the width of the grey band in Michael's AGP clearly suggests occasional activities across the night that need investigation.

### What actions might you agree with Michael?

- Michael's unpredictable lifestyle is leading to considerable glucose variability in his day, including the risk of overnight low glucose events. Try to determine what is causing the variation and help Michael understand how to manage his condition during these times. Avoiding overnight hypoglycaemia is a priority.
- Michael is urged to pay close attention to his evening mealtime activities and try to be more consistent in his therapeutic management at this time.
- Michael should either consider increasing his prandial dose of insulin at lunchtime or improving the timing of his injection ahead of eating in order to address the glucose excursion after lunch.