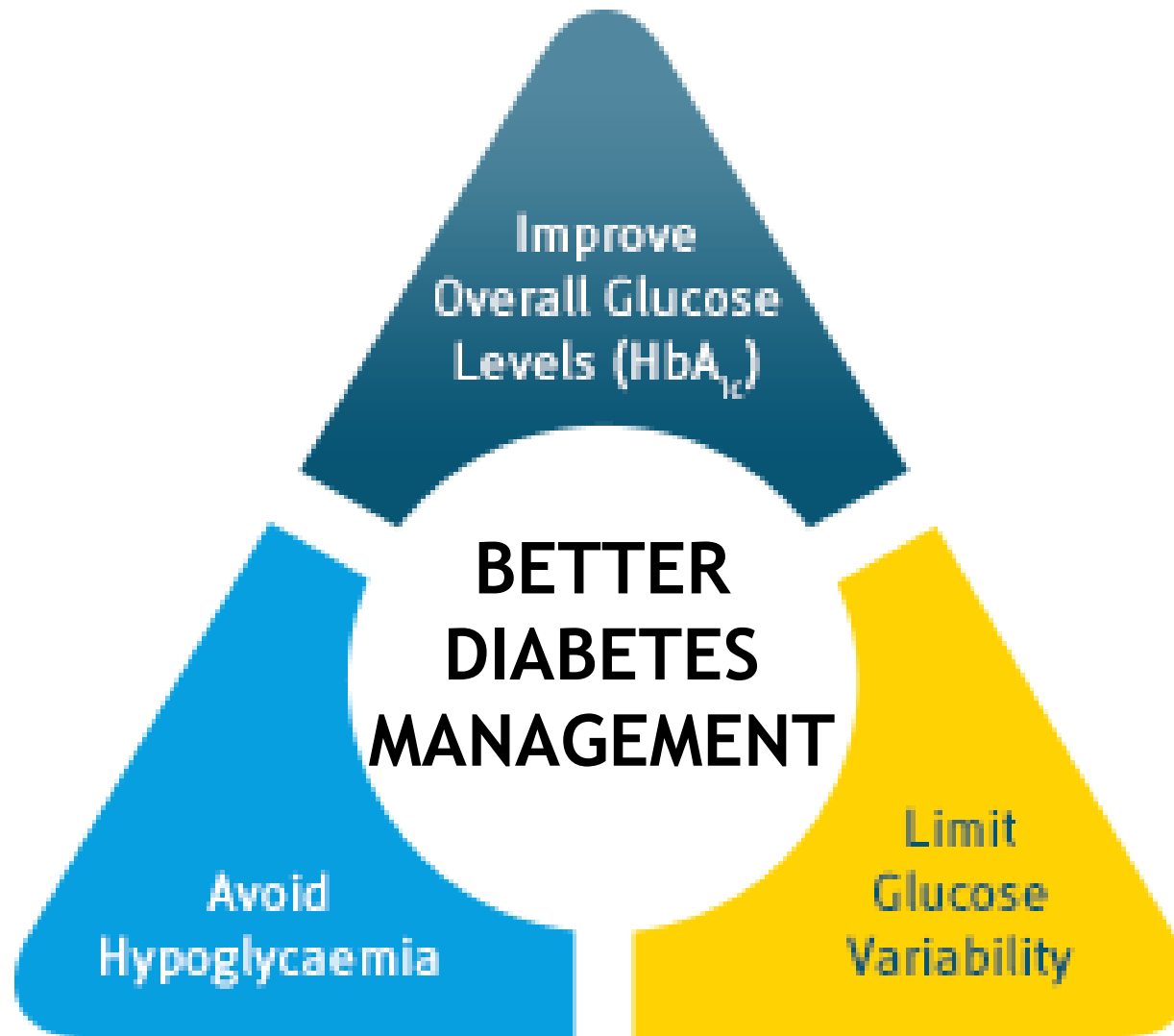# Ambulatory Glucose Profile (AGP) Case Study

RN Chau Man Kam

Diabetes, Obesity, Metabolic & Endocrine Centre

Changi General Hospital

Management of Diabetes

Rayman G. *Glycaemic control, glucose variability and the Triangle of Diabetes Care*. Br J Diabetes. 2016; *16*(Suppl 1): S3-S6

Flash Glucose Monitoring & AGP

▶ Provide **necessary data** to detect the **reasons and timing** to dysglycaemia and hence allows healthcare professionals to decide on **therapy** to be used and provide the relevant behaviour **advice** (Mazze et al., 1987).

▶ By understanding the characteristics of AGP

(exposure, variability, stability, hypoglycaemia risks), it allows healthcare providers to discover what is inadequately controlled (Rayman, 2016).

Case Study

Latent Autoimmune Diabetes of Adulthood (LADA)

HbA1c 8.4%

Case Study

65 years old, Chinese
DM for > than 13 years.
Hypertension & Hyperlipidemia

Medications:
Metformin 850mg TDS &
Lispro (soluble insulin)

Case Study

Switched to insulin pump therapy since April 2018 with successful improvement of glucose.
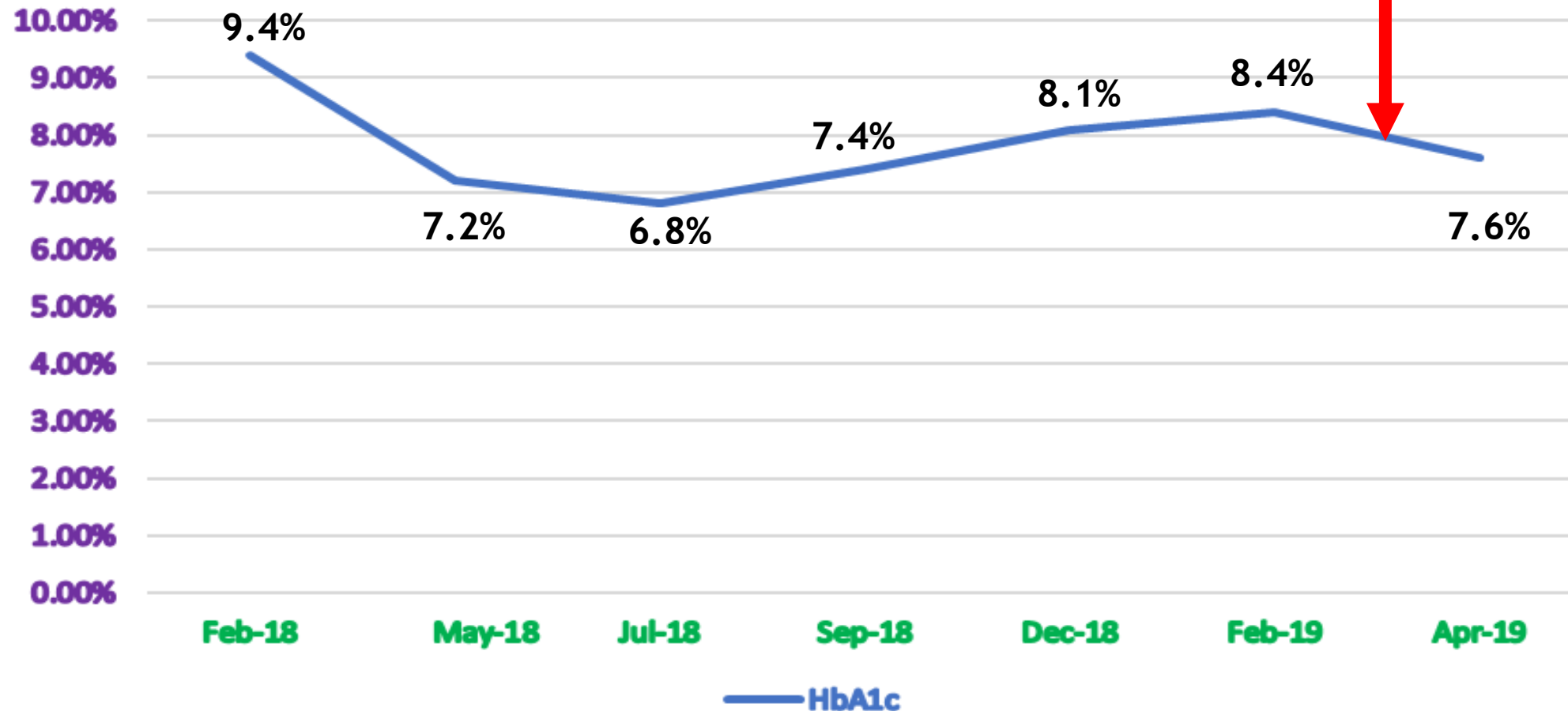
9.4%(Feb 2018), ⬇ **7.2**% (May 2018)

Current HbA1c shows a rising trend.

7.4% (Sep 2018), ⬆ **8.4**% (Feb 2019)

HbA1c Records

HbA1c

Feb-18	May-18	Jul-18	Sep-18	Dec-18	Feb-19	Apr-19

9.4%   7.2%   6.8%   7.4%   8.1%   8.4%   7.6%

Use of flash glucose monitoring system on 17th -31st March 2019

Education & Management Provided

▶ Current Insulin Treatment:

Lispro (soluble insulin) via insulin pump

▶ Current basal rates: (*about 34.1 unit/day*)
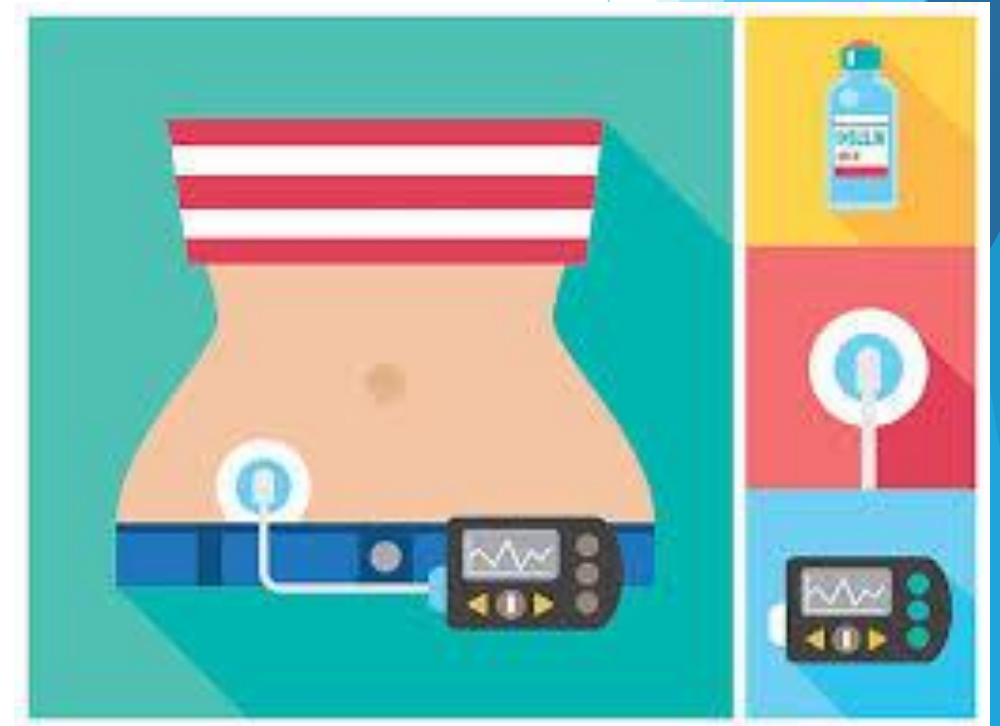
6am-9am: 1.5u/hour

9am-3pm: 1.6u/hour

3pm-8pm: 1.7u/hour

8pm-10pm: 1.4u/hour

10pm-2am: 1.1u/hour

2am-6am: 1u/hour

ICR= 1: 3, ISF= 1: 2

Education & Management Provided

▶ Use of the flash glucose monitoring system

▶ Interpretation of glucose insights from AGP

▶ Attended a 2.5 days Type 1 Diabetes Workshop

▶ Attended 2 sessions of Joint Dietitian and Diabetes Nurse Educator consultation

Analysis of Ambulatory Glucose Profile

Ambulatory Glucose Profile

Snapshot
17 March 2019 - 31 March 2019 (15 days)

📱 **Glucose**

Estimated A1c 7.2% or 55 mmol/mol
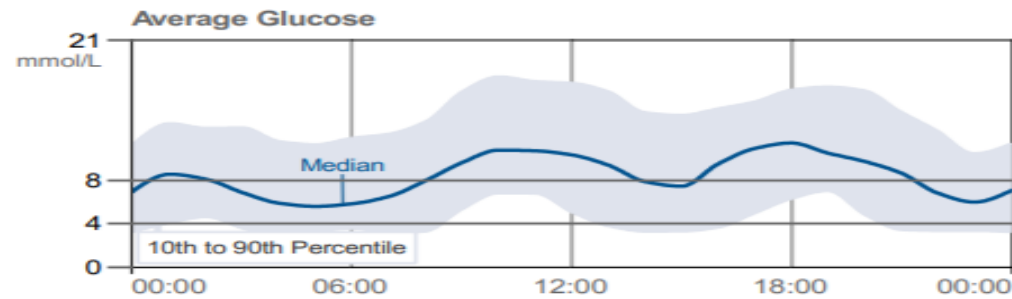
AVERAGE GLUCOSE **8.9** mmol/L

% above target	54	%
% in target	34	%
% below target	12	%

Average Glucose

Median
10th to 90th Percentile

LOW-GLUCOSE EVENTS **20**

Average duration **137** Min

Low-Glucose Events
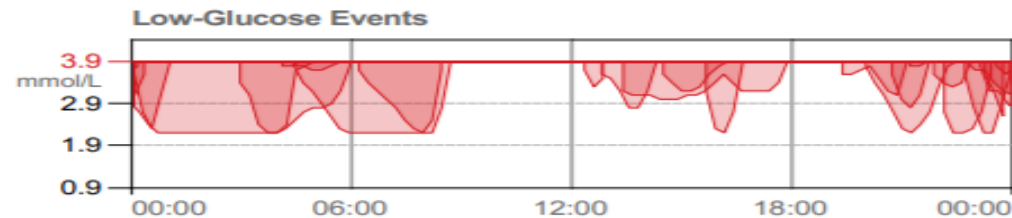
📶 **Sensor Usage**

SENSOR DATA CAPTURED **98** %

Daily scans **9**

Sensor Data Captured
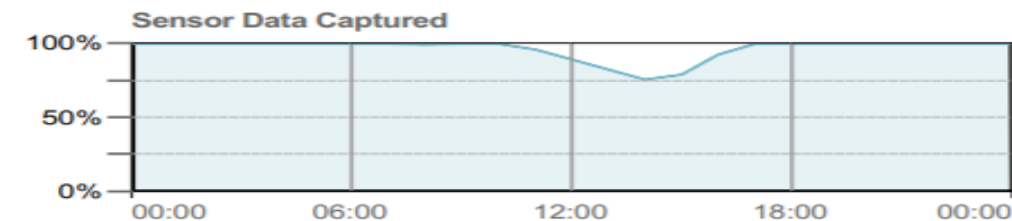
1. What is the time in range?

2. Did hypoglycaemia occur?

3. Is the data quality good?

Ambulatory Glucose Profile

How was flash glucose monitoring useful in this case?

▶ An alternative method for self-blood glucose monitoring.

(CBG: Pain, inconvenience, stigma)

▶ *Patient has potential for behaviour change & is willing to accept changes in her medication regime.*

▶ *Visualize dysglycemia and identify opportunities for improvements*

▶ Detection of hypoglycemia risks

▶ Led to more accurate and safer insulin titration.

Progress

► Improvement in HbA1c: **8.4**% (Feb 2019), ⬇ **7.6**% (Apr 2019)

► Advised to reduce bolus insulin for meals because of post meals hypoglycaemia.

► Hypoglycaemia prevention & management and carbohydrate calculation was emphasized.

Moving Forward…

▶ With the AGP, it allows the healthcare team to have a **better understanding** and **visualisation of glucose patterns and trends**, plotted on a 24-hour day "model", assess the **risk of hypoglycemia**, **monitor glucose variations**, assisting them to make **better treatment** decisions or adjustments to diabetes management for patients (Bergenstal et al., 2013).

Moving Forward...

▶ **Every** healthcare personnel play a **significant**

role on the outcome of the patients' health condition.
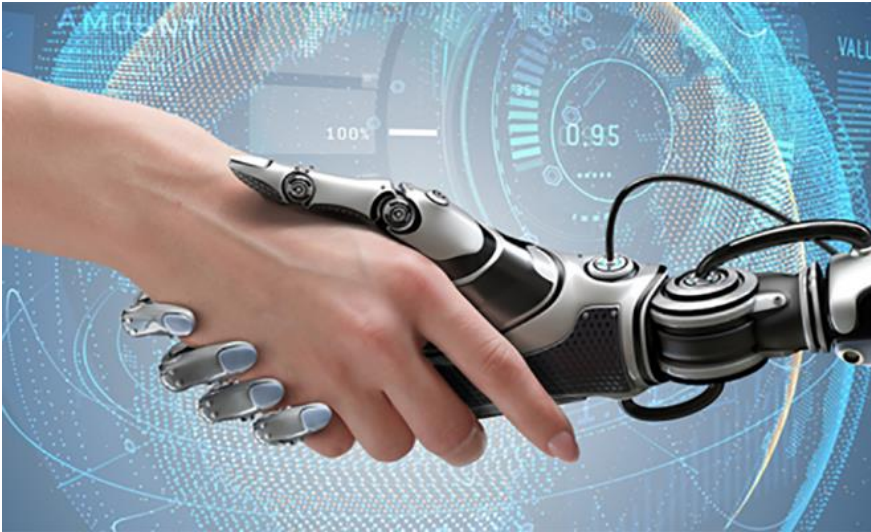
▶ **Innovation** through using diabetes technology such as the use of the flash glucose monitoring system and AGP bring about **indirect influence** on **behaviour modification** and **lifestyle changes** (Kroger et al., 2018).

Moving Forward…

▶ Diabetes educators could **enhance current diabetes management** by equipping oneself with the knowledge and clinical skills via **continuous learning**, at the same time incorporating technology and putting it into good use, and designing interventions and treatment plans with the **collaboration with the multi-disciplinary team**

(Matthaei et al., 2014).

Let's establish a transformational culture to 'FIGHT' diabetes together as a nation.

Patients at the HEART of all we do!

Conclusion

References

Bergenstal RM, Ahmann AJ, Bailey T, et al. *Recommendations for standardizing glucose reporting and analysis to optimize clinical decision making in diabetes: the ambulatory glucose profile*. J Diabetes Sci Technol. 2013; *7*: 562-578.

Kroger J. Reichel A, Siegmund T, et al. *Practical recommendations for the ambulatory glucose profile*. Diabetologie und Stoffwechsel. 2018: *13*(02): 1 74-83

Matthaei S, Dealaiz RA, Bosi E, et al. *Consensus recommendations for the use of Ambulatory Glucose Profile in clinical practice*. Br J Diabetes Vasc Dis. 2014: *14*: 153-57.

Mazze R, Lucido D, Langer O, Hartmann K, Rodbard, D. *The ambulatory glucose profile: a representation of verified self-monitored blood glucose data*. Diabetes Care. 1987;*10*(1):111-117.

Rayman G. *Glycaemic control, glucose variability and the Triangle of Diabetes Care*. Br J Diabetes. 2016; *16*(Suppl 1): S3-S6.

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