University College London Hospitals NHS
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Minimed™ 670G System – a dietetic perspective

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Overview

- Provide an overview of Minimed™ 670G system
- How the system changes our advice
- Real-life experience!

What is the Minimed™ 670G system?

- Insulin pump
- Linked BG meter (Contour Next Link 2.4)
- Guardian 3 sensors (7 day wear)
- Guardian Link 3 transmitter

- Hybrid closed loop system

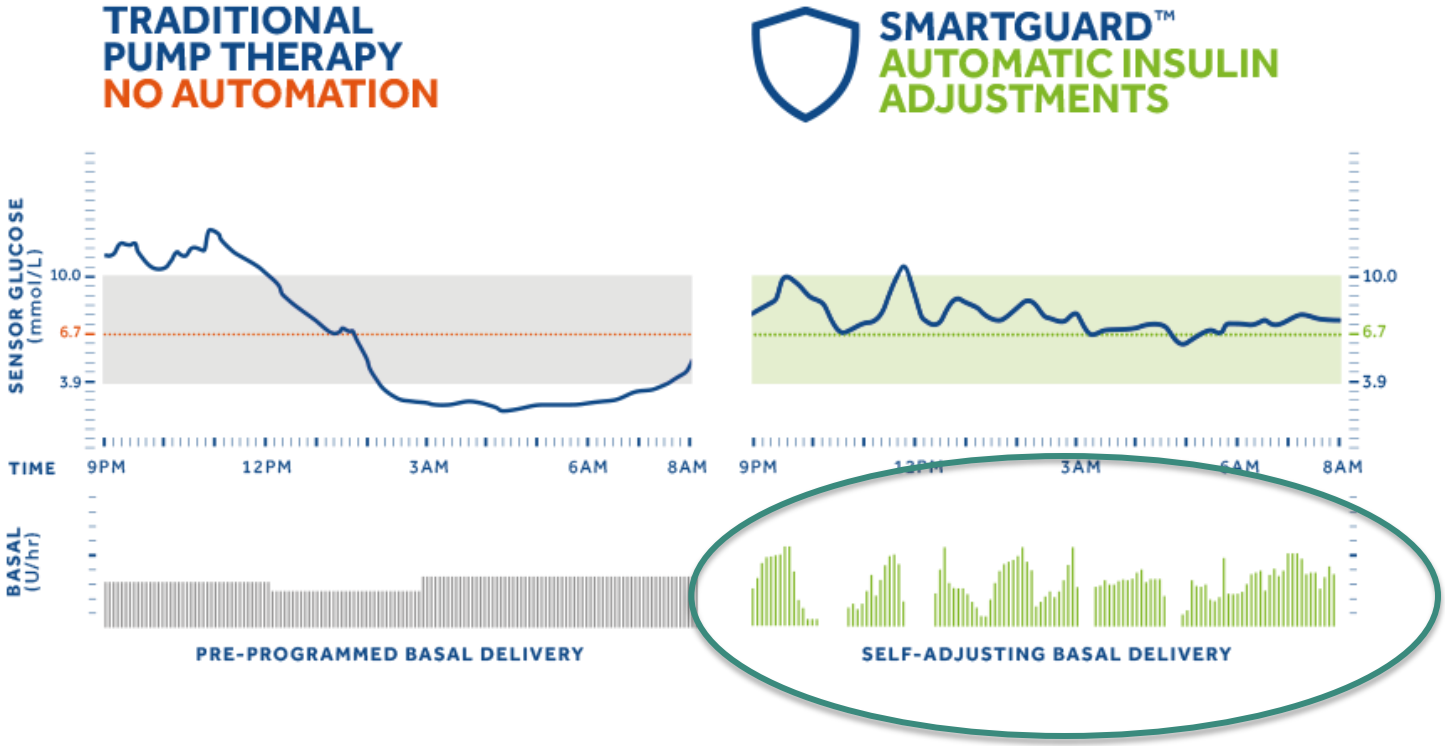
How does it work?

- Smartguard™ Automode technology
  - No basal ‘rates’
  - Basal insulin adjusted every 5 minutes based on sensor glucose readings (microbolus)
  - Fixed target glucose 6.7mmol/L

- Continuous sensor wear required
  - Recommended >90%

- Uses Total Daily Dose (TDD)
  - Algorithm updates every 6 days

Bolus for carbohydrate – not automatic!



Traditional pump therapy gives you patients the ability to set multiple basal patterns throughout the day and night but it can be very challenging to predict and match unique basal insulin requirements that are changing on a daily basis.

SmartGuard™ technology automatically adjusts basal insulin every five minutes based on sensor glucose values to adapt to your unique insulin needs. You simply enter mealtime carbohydrates and respond to system prompts.

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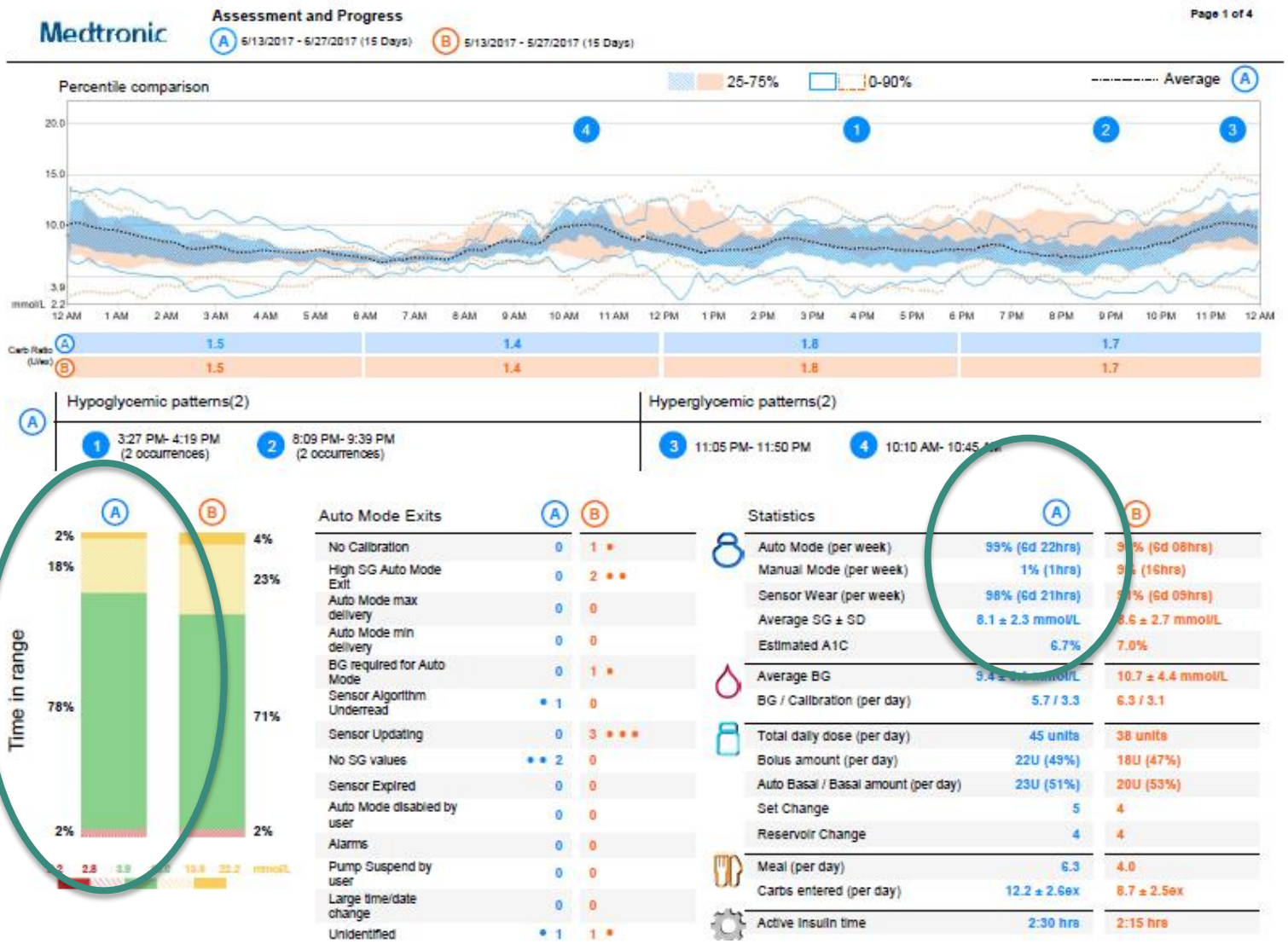
Medtronic
Assessment and Progress
A 6/13/2017 - 6/27/2017 (15 Days)
B 5/13/2017 - 5/27/2017 (15 Days)
Page 1 of 4
Percentile comparison
25-75%
0-90%
Average
20.0
15.0
10.0
3.9
mmol/L 2.2
12 AM 1 AM 2 AM 3 AM 4 AM 5 AM 6 AM 7 AM 8 AM 9 AM 10 AM 11 AM 12 PM 1 PM 2 PM 3 PM 4 PM 5 PM 6 PM 7 PM 8 PM 9 PM 10 PM 11 PM 12 AM
Carb Ratio (Units)
A 1.5 1.4 1.8 1.7
B 1.5 1.4 1.8 1.7
Hypoglycemic patterns(2)
1 3:27 PM- 4:19 PM (2 occurrences)
2 8:09 PM- 9:39 PM (2 occurrences)
Hyperglycemic patterns(2)
3 11:05 PM- 11:50 PM
4 10:10 AM- 10:45 AM
Time in range
2%
18%
78%
2%
4%
23%
71%
2%
Auto Mode Exits
No Calibration 0 1
High SG Auto Mode Exit 0 2
Auto Mode max delivery 0 0
Auto Mode min delivery 0 0
BG required for Auto Mode 0 1
Sensor Algorithm Underread 1 0
Sensor Updating 0 3
No SG values 2 0
Sensor Expired 0 0
Auto Mode disabled by user 0 0
Alarms 0 0
Pump Suspend by user 0 0
Large time/date change 0 0
Unidentified 1 1
Statistics
Auto Mode (per week) 99% (6d 22hrs) 98% (6d 08hrs)
Manual Mode (per week) 1% (1hrs) 2% (16hrs)
Sensor Wear (per week) 98% (6d 21hrs) 91% (6d 09hrs)
Average SG ± SD 8.1 ± 2.3 mmol/L 8.6 ± 2.7 mmol/L
Estimated A1C 6.7% 7.0%
Average BG 10.7 ± 4.4 mmol/L
BG / Calibration (per day) 5.7 / 3.3 6.3 / 3.1
Total daily dose (per day) 45 units 38 units
Bolus amount (per day) 22U (49%) 18U (47%)
Auto Basal / Basal amount (per day) 23U (51%) 20U (53%)
Set Change 5 4
Reservoir Change 4 4
Meal (per day) 6.3 4.0
Carbs entered (per day) 12.2 ± 2.6ex 8.7 ± 2.5ex
Active Insulin time 2:30 hrs 2:15 hrs

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When ‘Automode’ doesn’t work

- Sensor issues
- No calibrations
- Prolonged high Sensor Glucose (SG)
- Automode maximum delivery for >4 hours
- Automode minimum delivery for >2.5 hours

If alerts/alarms are ignored!

Does our advice change?

Carbohydrate counting

640G	670G
• Essential to tell the pump when there is food/drink • Missed boluses lead to rapid rise in glucose	• Essential to tell the pump when there is food/drink • Missed boluses lead to rapid rise in glucose • Alarms/Alerts • ?Exit Automode • ?accuracy required

Timing of bolus

640G	670G
• Optimal timing 15 minutes before eating	• Optimal timing 20 minutes before eating • If not ⟹ spikes in glucose • Alarms/Alerts • ?Exit Automode

Types of Bolus

640G	670G
Use Dualwave for main meals • Use 50-70% upfront and extend over 2-3 hours • Square portion of bolus can be stopped if food not eaten	**No** Dualwave function • Give all insulin as a single bolus (20minutes before) • Auto basal adjusts the basal insulin in response to rising glucose in the hours after eating

Meal composition

640G	670G
For high fat and/or high protein meals: • Use Dualwave bolus • Consider increasing insulin dose • Prevent high BG 3-5 hours after eating	For high fat and/or high protein meals: • Give 50% dose upfront and give a second bolus (remaining 50%) after eating • Auto basal adjusts the basal insulin in response to rising glucose in the hours after eating

Breakfast

640G	670G
• Pre-bolus (20-30minutes before eating) • Low GI options • Add in protein • Superbolus	• Pre-bolus (20-30minutes before eating) • Low GI options • Add in protein • Auto basal adjusts the basal insulin in response to declining glucose in the hours after eating

Exercise management

640G	670G
Prevention of hypos: • Reduced TBR (during and after) • Reduce mealtime insulin • Extra carbohydrate Managing high glucose • Give ½ correction	Prevention of hypos: • Increase temporary target to 8.3mmol/L • Free carbs can lead to increased basal Managing high glucose • Unable give ½ correction • If rise in glucose is rapid (adrenaline) may lead to alarms/alerts

What settings can be changed?

640G	670G
• Carb ratios • Active insulin time • Correction factor • BG targets	• Carb ratios • Active insulin time

- Unable to change target glucose
- Correction is determined by algorithm
- Watch out for extra carbs!

Mini- Summary

Much of our education advice remains the same

- Knowledge of carbohydrate and how to count them
- Understanding how foods/meals affect BG
- Understanding action of the insulin; pre-bolusing
- Understanding the impact of exercise/activity on BG
- Carb ratio review

What's different?

- Limited scope for changing settings, bolus functions
- Letting the system do it's thing

Theoretical vs 'Real-life'

Thanks for listening

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