

Continuous Glucose Monitoring Clinical Case Studies

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When CGM?

- More information - better control
- HbA1c and fingerprick reading not corresponding
- „Unexplained” highs or lows
- Hypo unawareness
- Changes in life (eg starting Uni)
- Pregnancy planning
- Sports
- Driving
-



Which CGM?

Last year (Dorothee Deiss)

Professional vs. Personal CGM

Retrospective = diagnostic

- short term (1-2 weeks)
- generally blinded (results visible after download and analysis by hcp); no alerts
- clinic owns system, patient buys 1-2 sensors
- lower costs, easier reimbursement
- minimal training, easy to use
- patient selection: all patients eligible; very limited interaction of patient w/ device
- impact: reduce A1c by 0.3%
- critical success factor: interpretation of glucose profiles by HCP

Prospective = preventive

- long term, therapeutic use
- real-time display and alerts
- patient owns system, applies for future sensors
- high costs, difficult reimbursement
- extensive education
- patient selection: patients need to be motivated and compliant to wear device during at least 70% of time
- impact: reduce A1c 0.7-1%
- critical success factor: patient empowerment to read and act upon continuous glucose information



Which CGM?

This year a third possibility

Flash monitoring (Abbott Freestyle Libre)

- short or long term (who owns the reader?)
- Recording continuously but showing only if read
- Can be read anytime, needs to be read at least 8 hourly to capture all data
- No realtime alerts
- Lower cost, reimbursement=?
- Easy to use, but more training required than for blinded
- Patient selection: ?
- Critical success factor?



Which CGM?

- More information - better control - **ANY**
- HbA1c and fingerprick reading not corresponding - **Blinded**
- „Unexplained” highs or lows – **ANY, depending**
- Hypo unawareness – **real time**
- Changes in life (eg starting Uni) – **real time**
- Pregnancy planning - **ANY, depending**
- Sports - **real time**
- Driving - **real time**



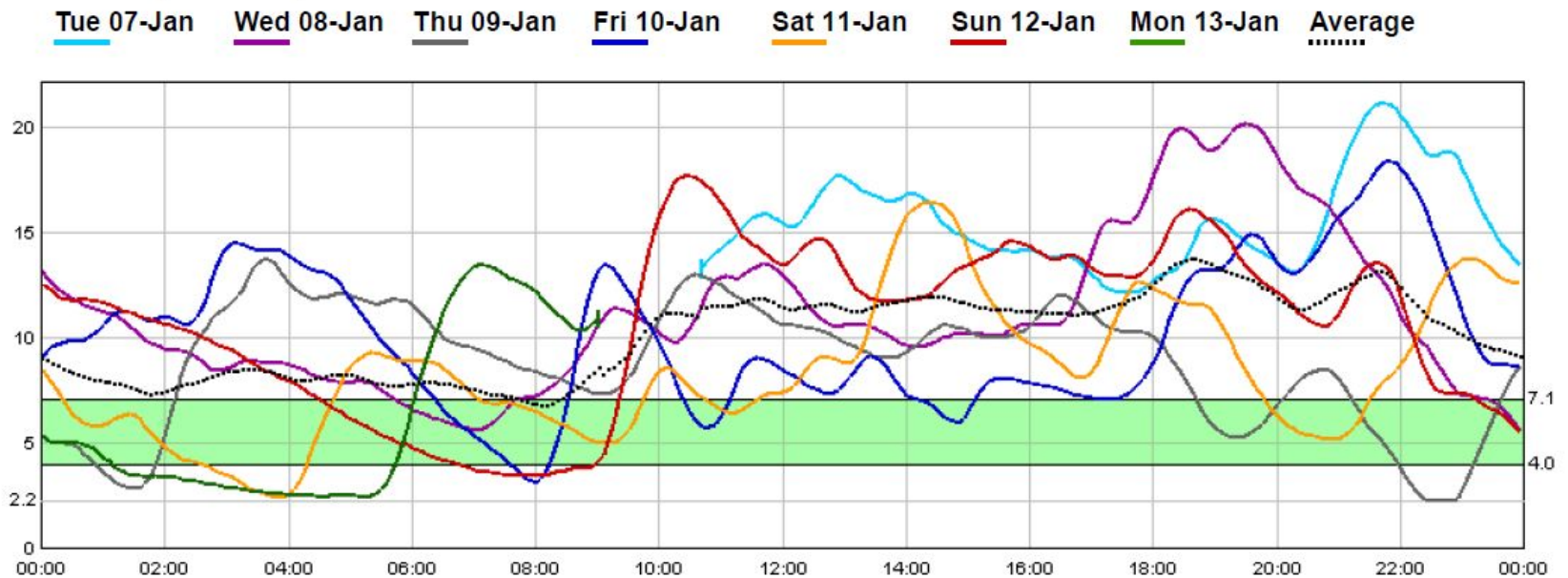
Case 1: blinded CGM

- 30 year old female
- T1DM for 10 years
- On MDI
- Would like to get pregnant in 1-2 years



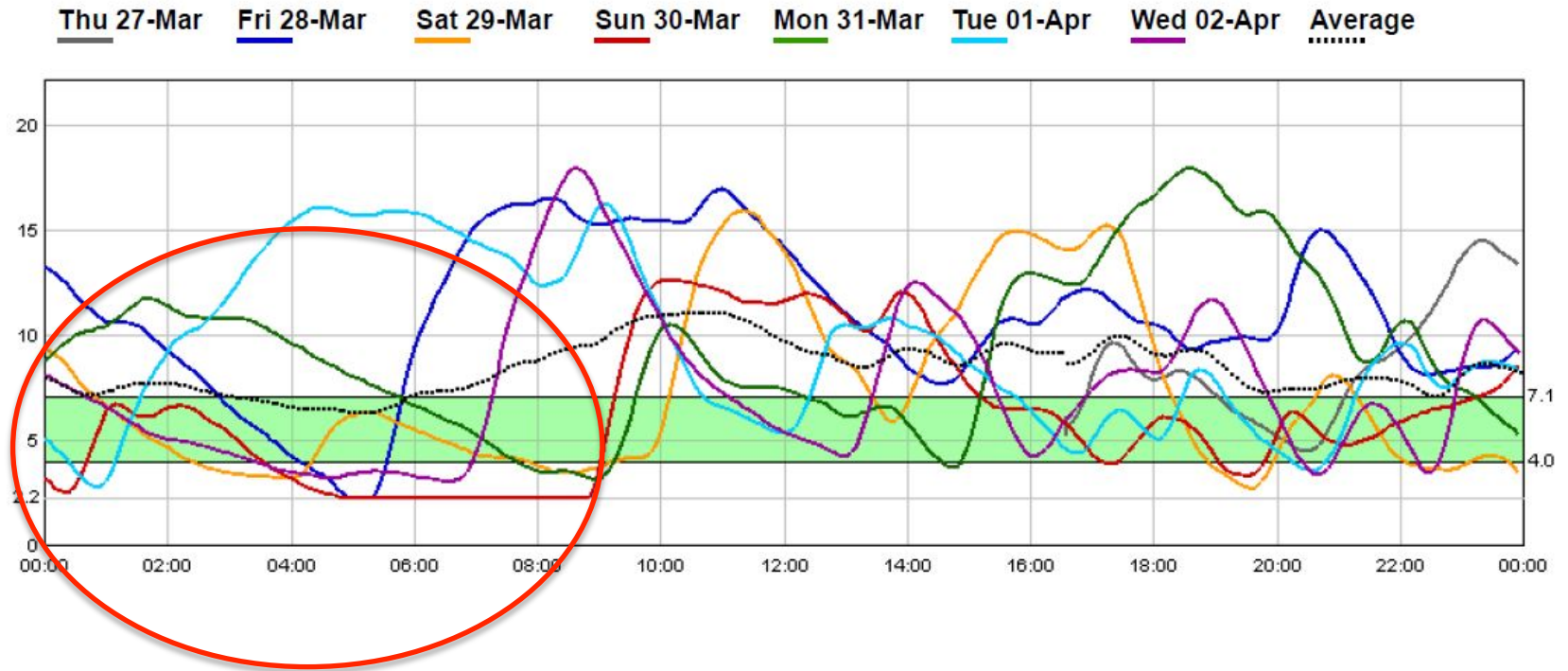
On Levemir/NovoRapid

Sensor Data (mmol/L)



On Tresiba

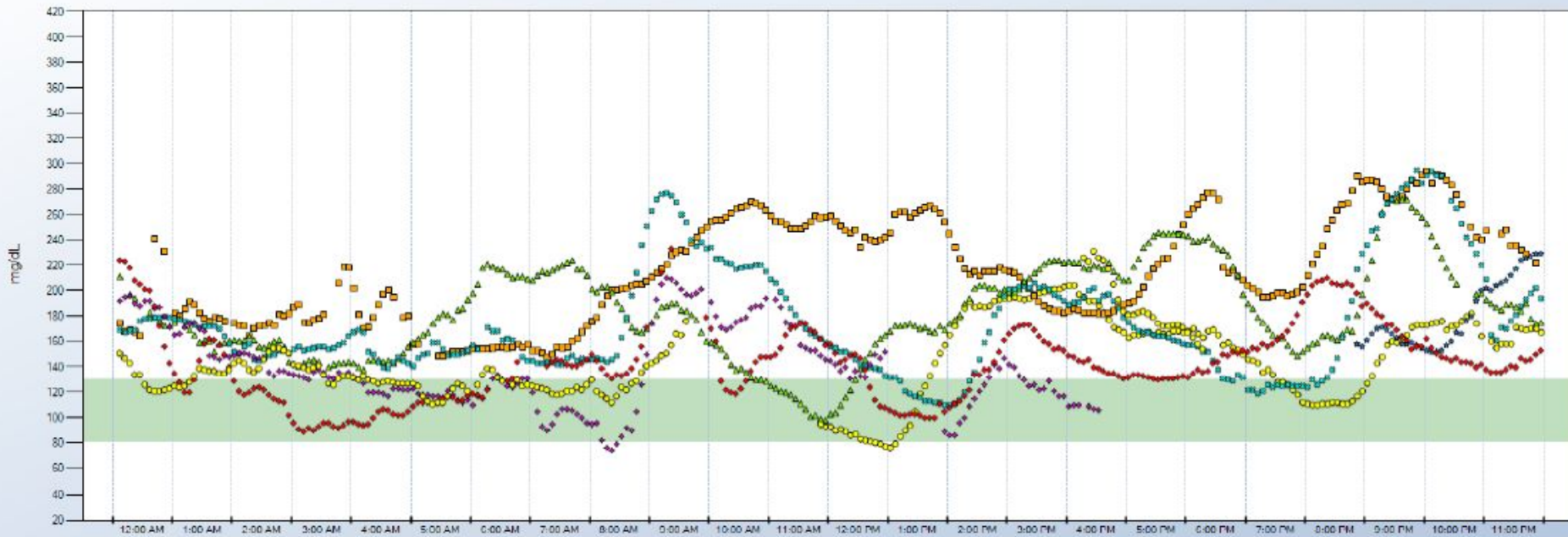
Sensor Data (mmol/L)



Importance of basal testing



Case 2 – Type 2 on basal insulin with Dexcom



Use of CGM as an educational tool in Type 2 diabetes?
Visualizing effect of diet and physical activity
Costs?



Case 3 – Type 1 pump patient on Freestyle Libre

 **Glucose**

Estimated A1c 6.3% or 45 mmol/mol

AVERAGE GLUCOSE **7.4** mmol/L



% above target **42** %

1.

% in target **45** %



% below target **13** %

AV
GL

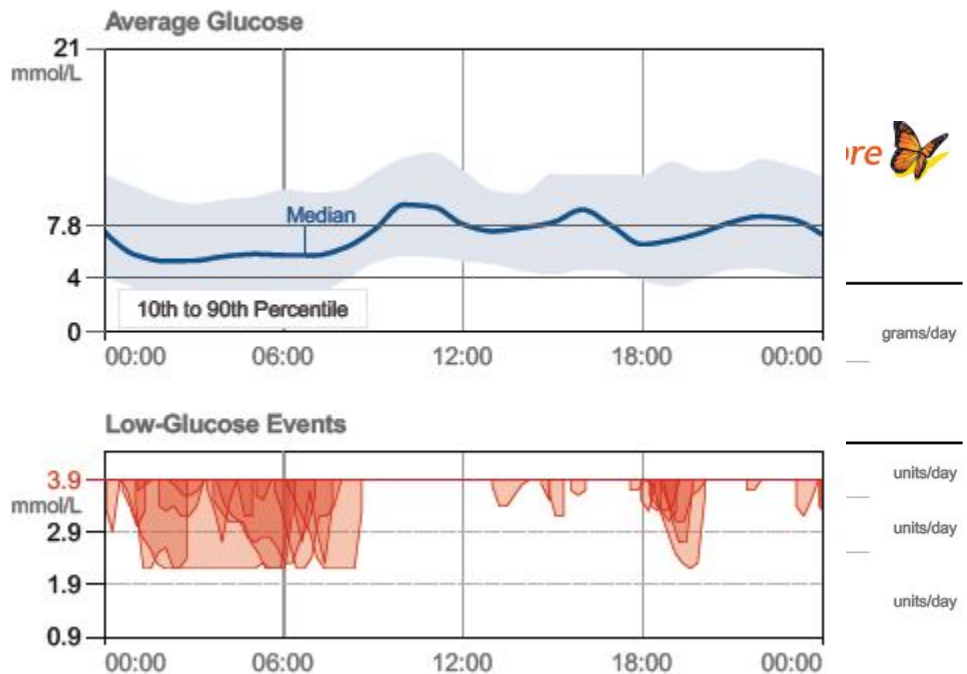
%

%

%

LOW-GLUCOSE EVENTS **24**

Average duration **113** Min



Case 3 – Type 1 pump patient on Freestyle Libre

Glucose Pattern Insights

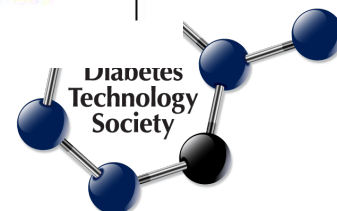
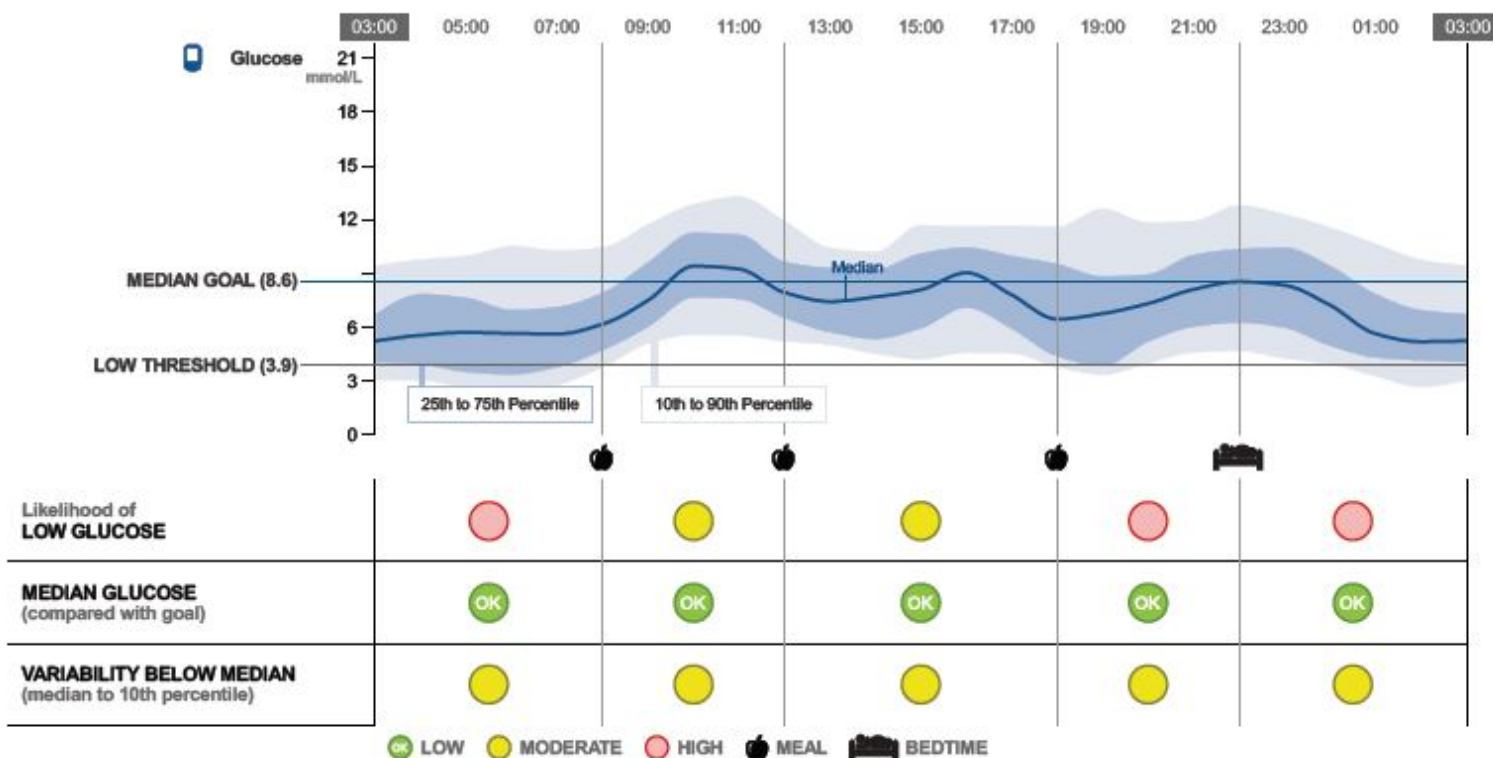
11 September 2014 - 25 September 2014 (15 days)

LOW-GLUCOSE ALLOWANCE SETTING: Medium

MEDIAN GOAL SETTING: 8.6 mmol/L (A1c: 7.0% or 53 mmol/mol)

FreeStyle Libre 

Estimated A1c 6.3% or 45 mmol/mol



Case 3 – Type 1 pump patient on Freestyle Libre

Daily Log

11 September 2014 - 25 September 2014 (15 days)



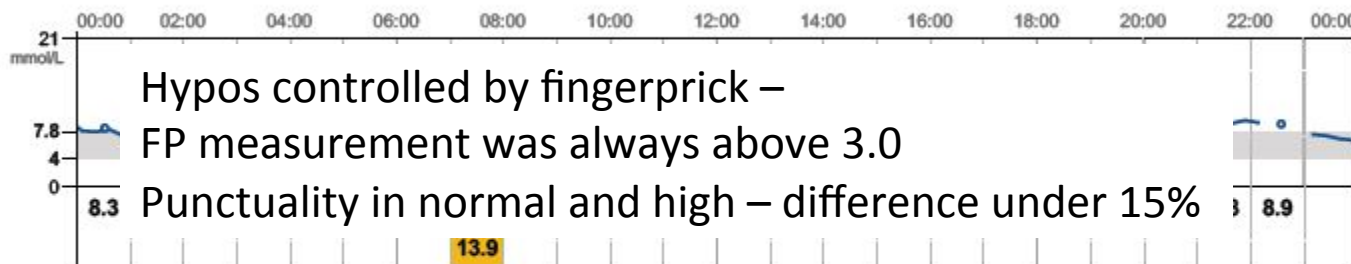
Daily Log

11 September 2014 - 25 September 2014 (15 days)



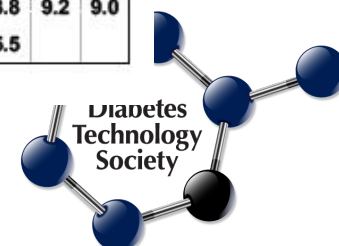
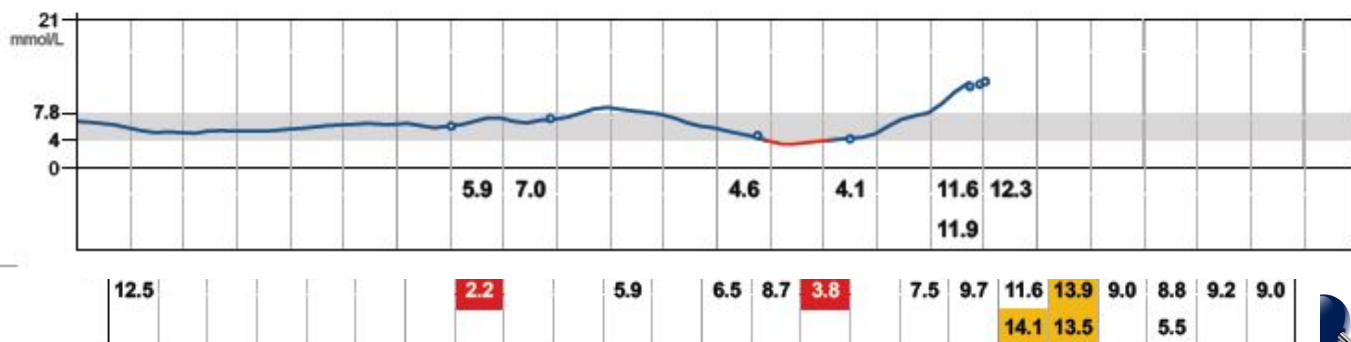
Wed 24 Sep

Glucose
mmol/L



Thu 25 Sep

Glucose
mmol/L



Case 4 – Type 1 planning pregnancy

	Glucose Measurements		Bolus Events					Fill Events					Suspend Duration (h:mm)
	BG Readings	Sensor Duration (h:mm)	Manual Boluses	Bolus Wizard Events	With Food	With Correction	Overridden	Rewind	Cannula Fills	Cannula Amount (U)	Tubing Fills	Tubing Amount (U)	
hétfő 2013.04.08.			7										0:28
kedd 2013.04.09.			6										0:27



2013.04.17.													
csütörtök 2013.04.18.	4	24:00	8										0:06
péntek 2013.04.19.	4	24:00	6										0:18
szombat 2013.04.20.	2	24:00	17										0:10
vasárnap 2013.04.21.	4	22:40	13					1	1	0,6	1	9,1	

Case 4 – Type 1 on Medtronic, planning pregnancy

Solution: Better Bolusing

Encourage use of Bolus Wizard

Review Bolus Wizard settings

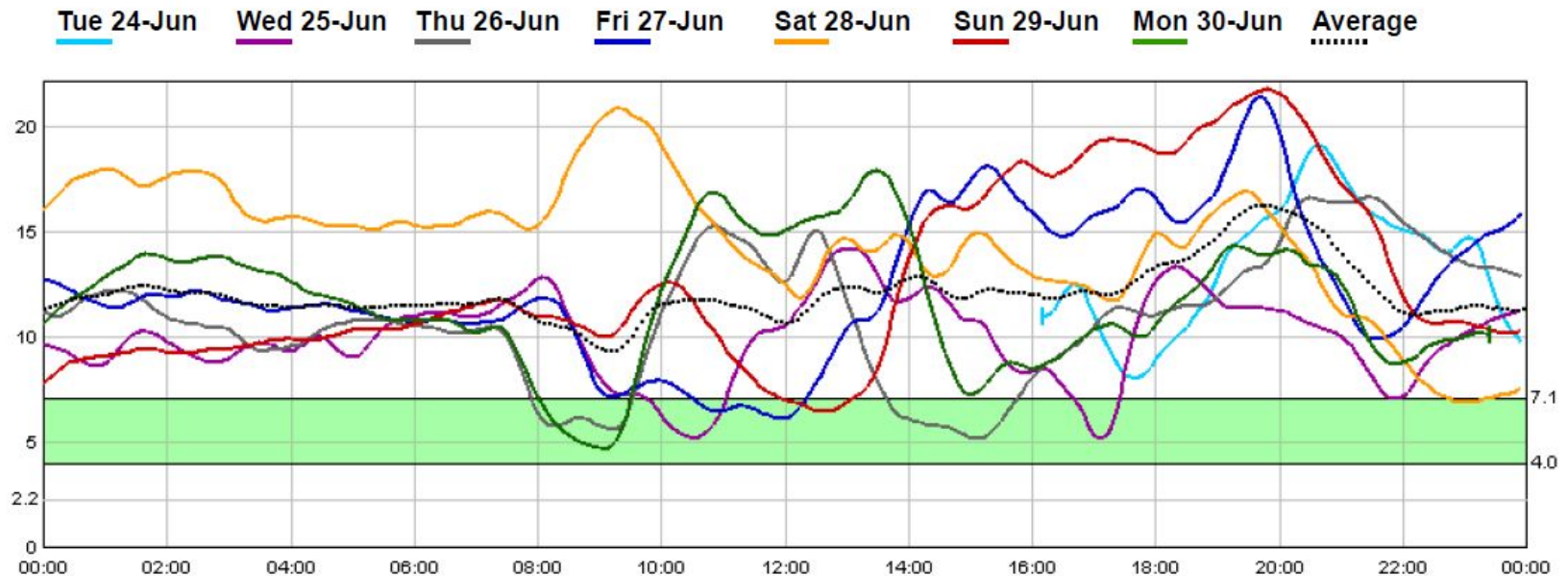
Review different boluses

Recap insulin stacking

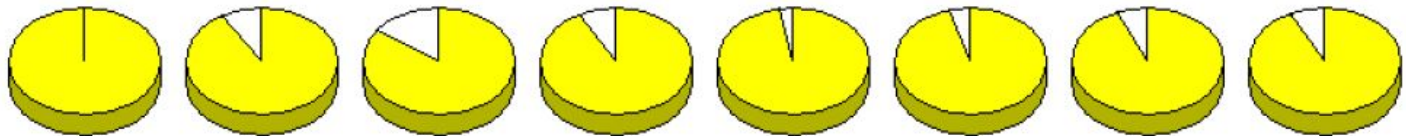


Case 5: Type 1 on pump, iPro

Sensor Data (mmol/L)



Duration Distribution (hh:mm)

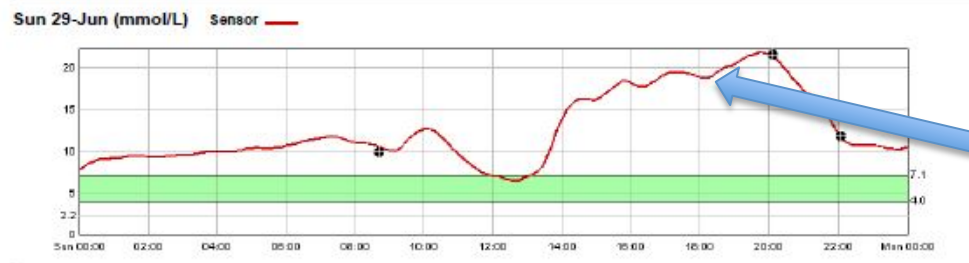
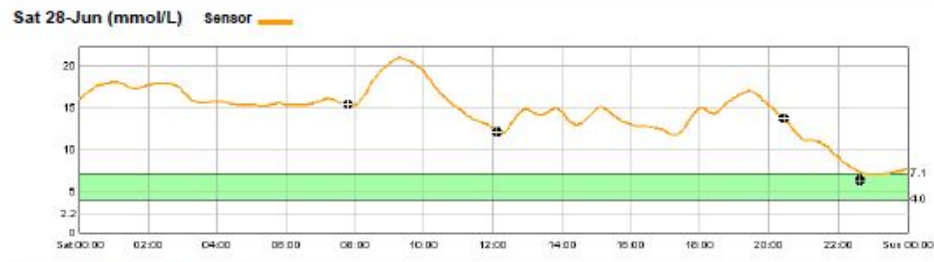


	7:50	100%	21:50	91%	20:15	84%	22:05	92%	23:20	97%	22:55	95%	22:00	94%	140:15	93%
Above 7.1	7:50	100%	21:50	91%	20:15	84%	22:05	92%	23:20	97%	22:55	95%	22:00	94%	140:15	93%
Within (4.0 - 7.1)	0:00	0%	2:10	9%	3:45	16%	1:55	8%	0:40	3%	1:05	5%	1:30	6%	11:05	7%
Below 4.0	0:00	0%	0:00	0%	0:00	0%	0:00	0%	0:00	0%	0:00	0%	0:00	0%	0:00	0%



Case 5: Type 1 on pump, iPro

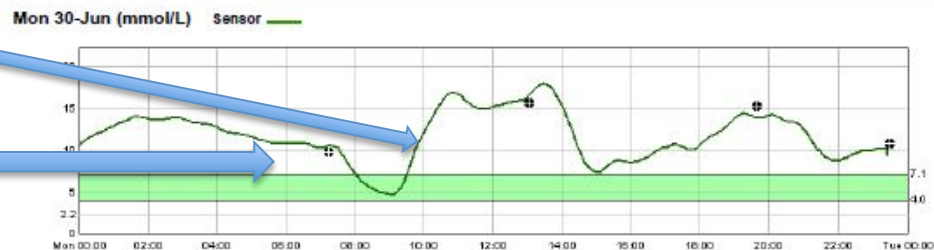
Correction, skipped breakfast



Grazing

Breakfast

Correction



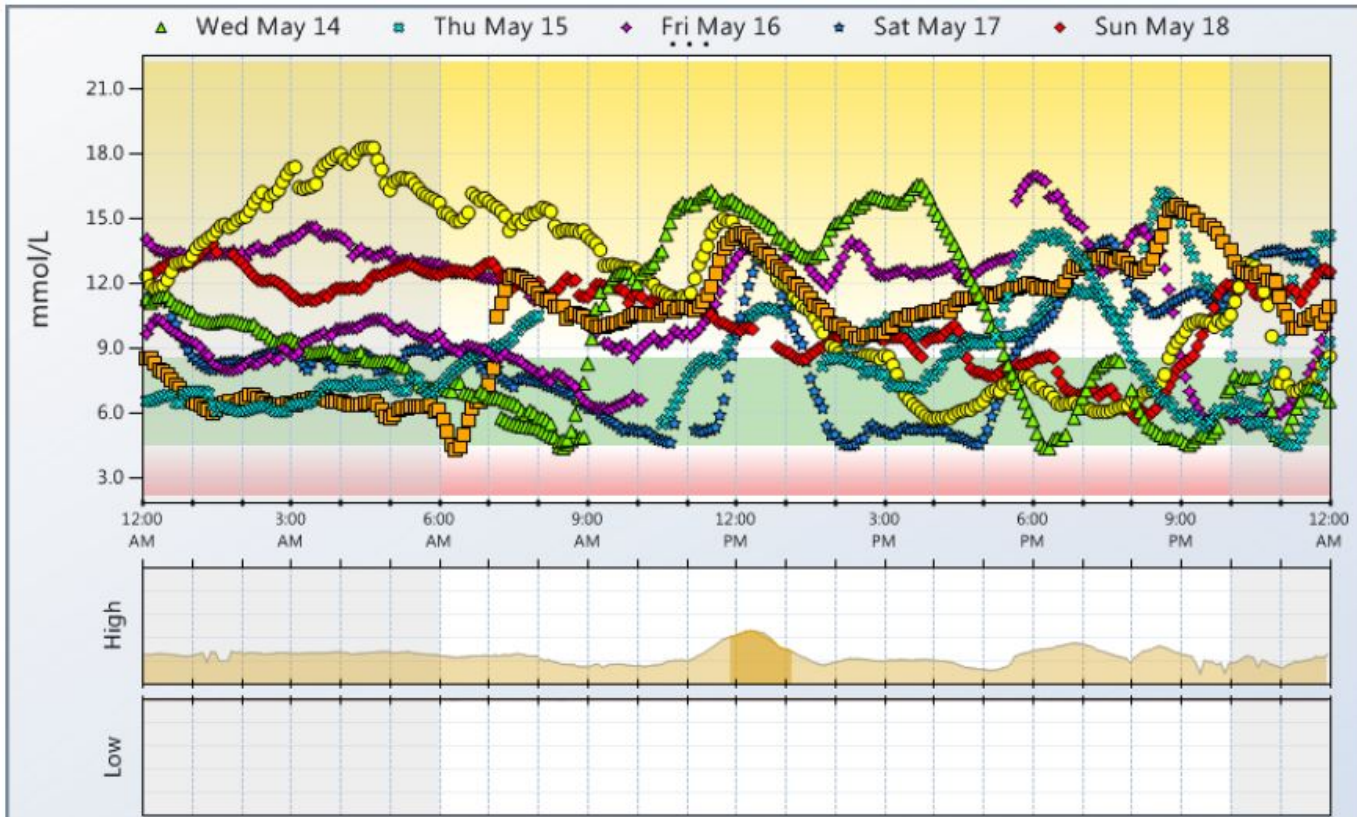
Case 5: Type 1 on pump, iPro

- Recap bolusing
- Bolus calculator settings review
- Encourage using bolus calculator
- Daytime basal check needed



Case 6: Type 1 on pump, erratic life

First Dexcom



Statistics

Average Glucose	10.09 mmol/L
Sensor Usage	10 of 10 days
Calibrations / day	2.0
Standard Deviation	± 3.10 mmol/L



65 % High

35 % Target

0 % Low

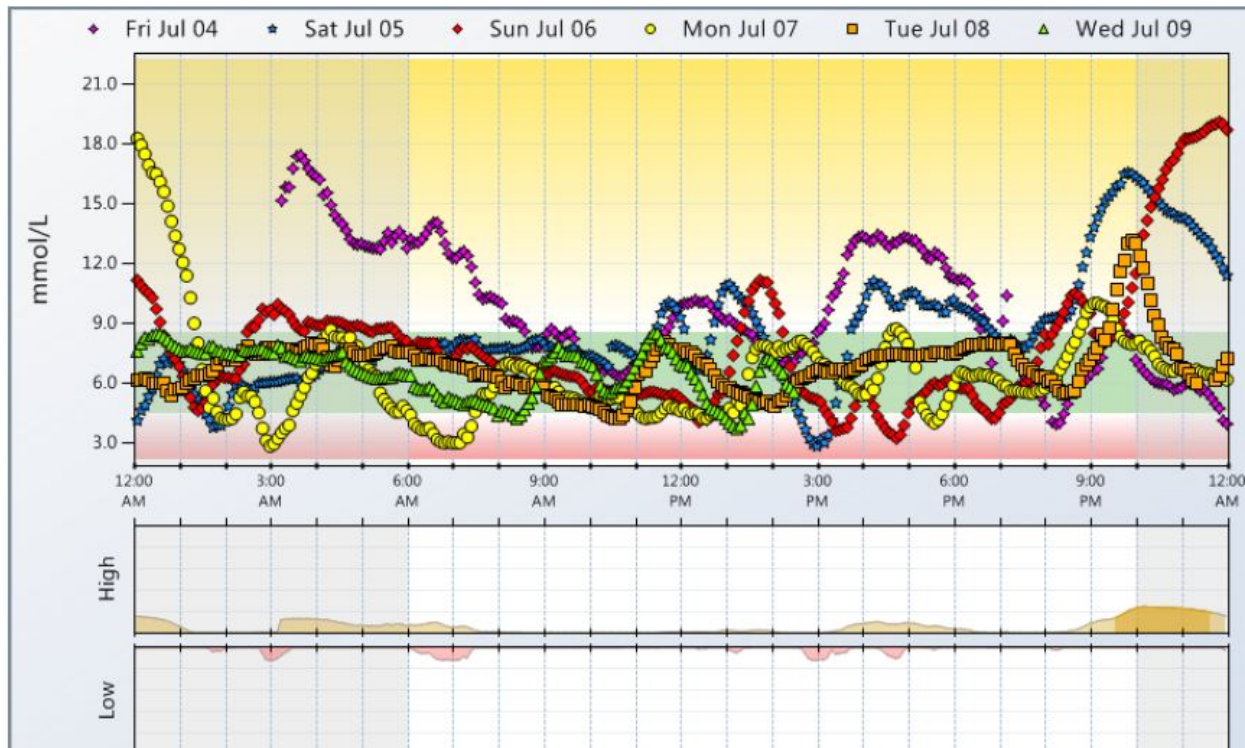
Target Range	4.4 - 8.5 mmol/L
Nighttime	10:00 PM - 6:00 AM

Interpretation



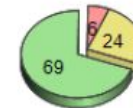
Case 6: Type 1 on pump, erratic life

Second Dexcom



Statistics

Average Glucose	7.69 mmol/L
Sensor Usage	6 of 10 days
Calibrations / day	2.3
Standard Deviation	± 2.88 mmol/L



24 % High
69 % Target
6 % Low

Target Range	4.4 - 8.5 mmol/L
Nighttime	10:00 PM - 6:00 AM

Interpretation



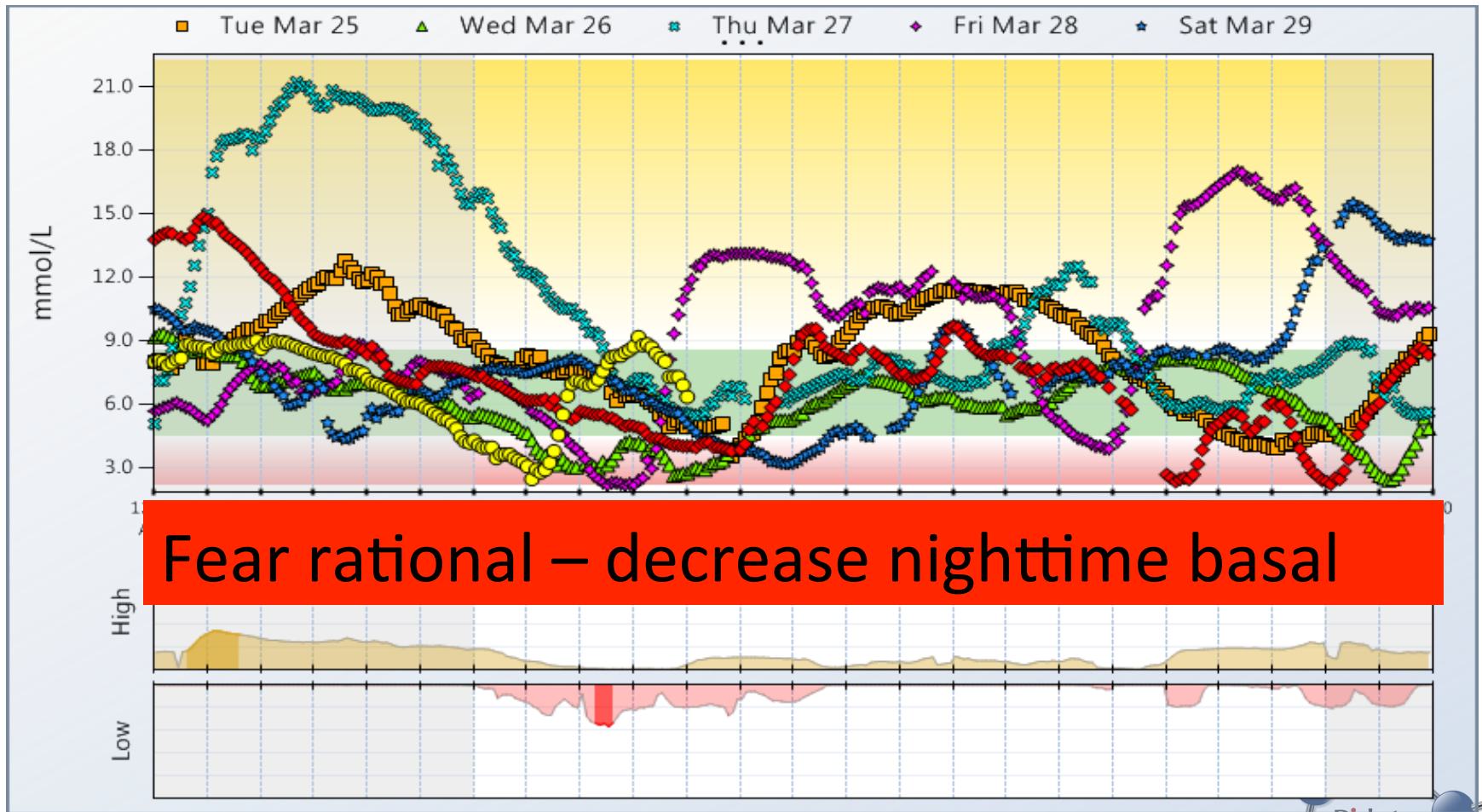
Case 6: Type 1 on pump, erratic life

Dexcom – educational tool

- HbA1c best ever
- Fear of hypos while working – alarms
- Use of reduced basal for workout
- Low carb meals
- Better correction



Case 7: Type 1 on pump, fear of overnight lows



Thank you for your attention!

