

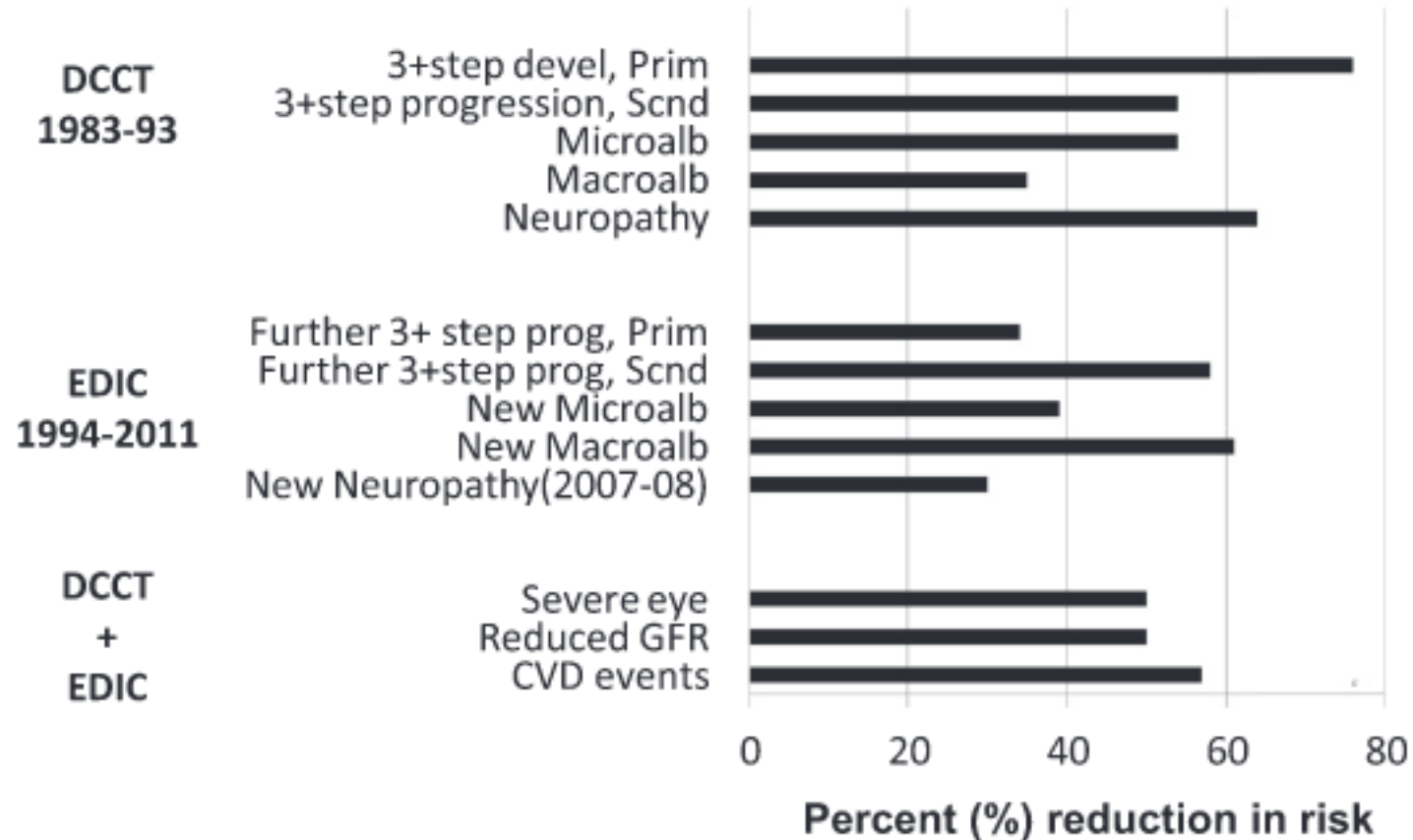
Technology for Management of Type 1 Diabetes – Pumps and CGM

John Wentworth

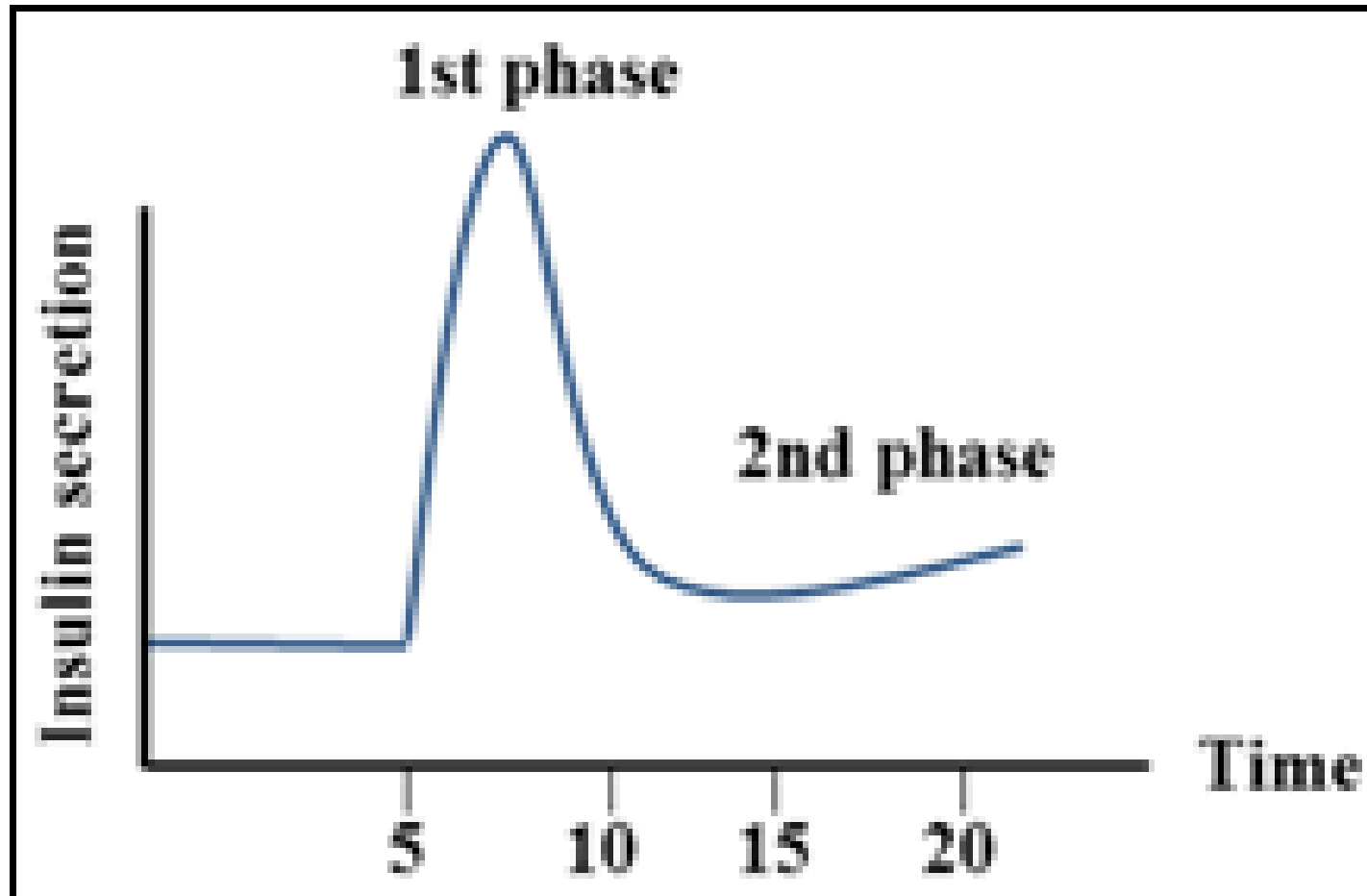
Endocrinologist

Royal Melbourne Hospital

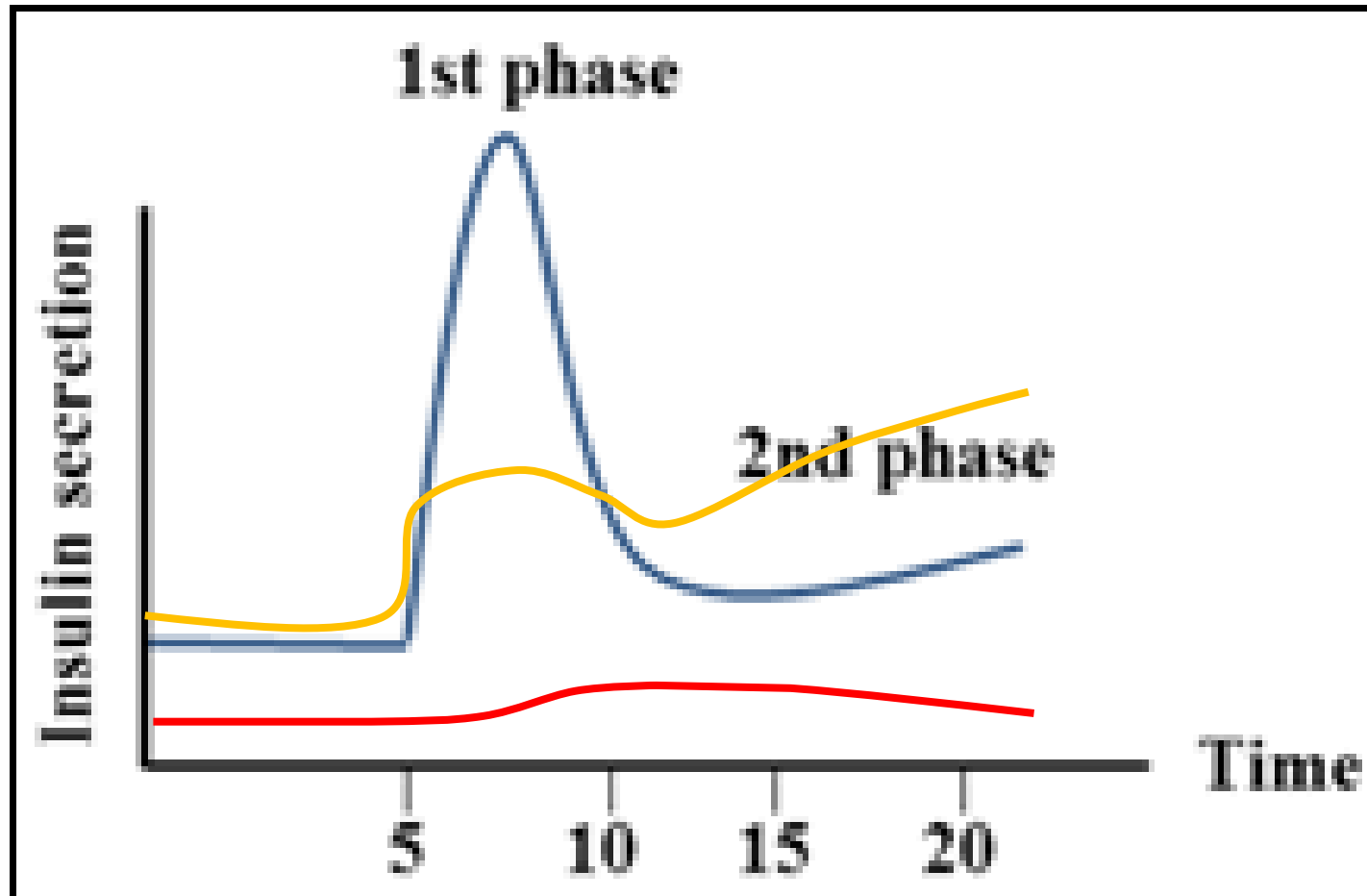
Tight glucose control in type 1 diabetes decreases the risk of vascular complications



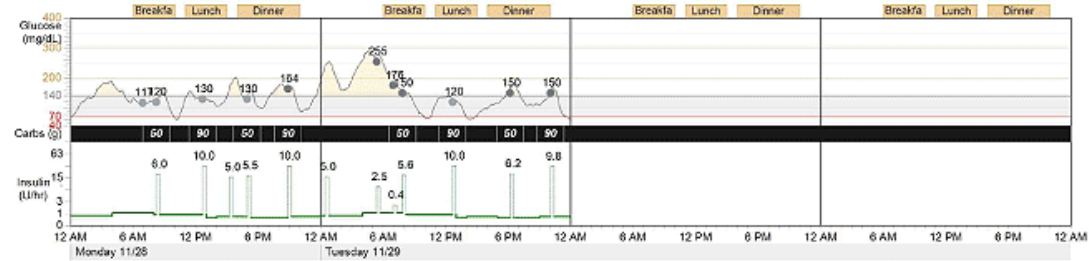
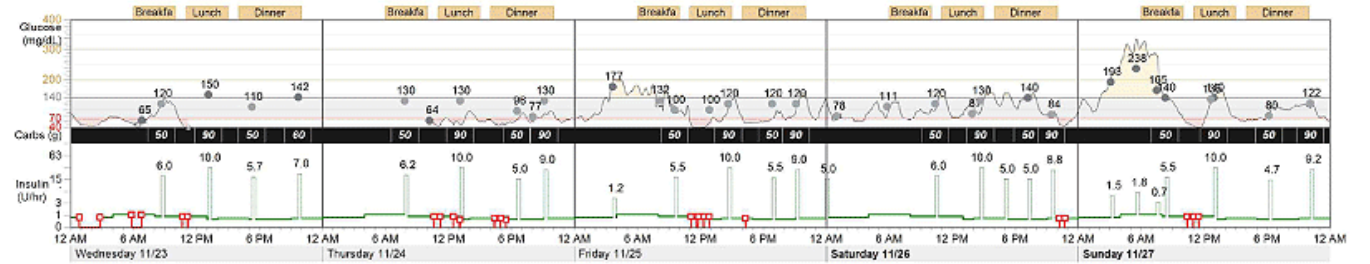
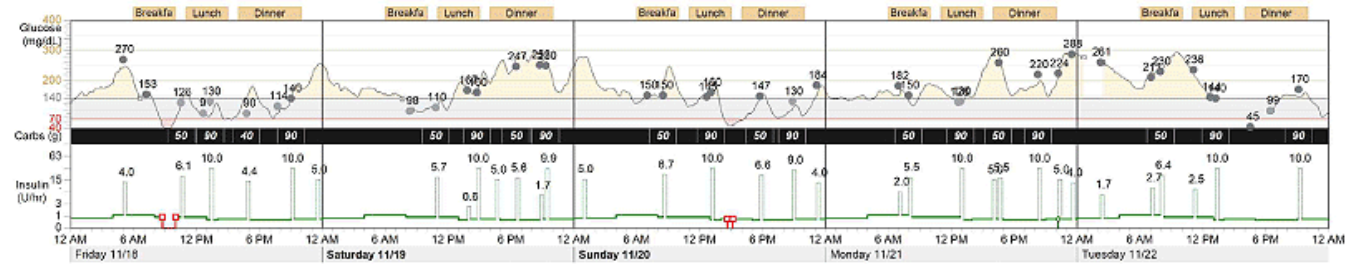
The normal insulin response to glucose challenge



The normal insulin response to glucose challenge



Insulin pumps



- Sensor trace
- BG reading
- Basal
- Bolus
- Suspend
- Time change
- Exercise
- Interrupted
- Off chart
- Temp basal
- Threshold Suspend
- Injected insulin (U)
- Other

Below Target*

Above Target*

Target Sensor Glucose Range*

Continuous glucose monitoring (CGM)



Relatively cheap
No finger pricks

No alarm
Not funded by NDSS
Not as accurate
Cannot talk to a pump

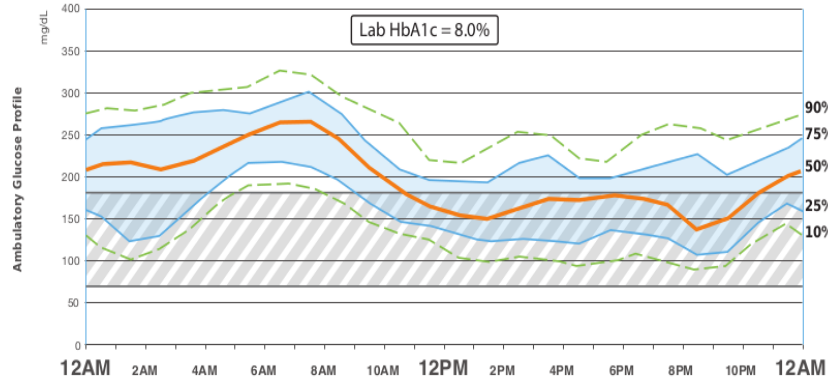


A. captürAGP® Patient 1 (14.0 days)

Glucose Statistics		Serious Low	Low	In Target Range	High	Serious High	SD	Coefficient of Variation	% Time CGM Active
Avg Glucose mg/dL	Estimated HbA1c	Below 54 mg/dL	Below 70 mg/dL	70 - 180 mg/dL	Above 180 mg/dL	Above 250 mg/dL	mg/dL	%	%
195	8.4%	0.0%	0.5%	42.2%	57.3%	23.1%	64	32.9%	97.4%
88 - 116 *	< 6 *	0 *	< 4 *	70 - 180 mg/dL > 90 *	> 180 mg/dL < 6 *	> 250 mg/dL 0 *	10 - 26 *	19.25 *	
GLUCOSE EXPOSURE		GLUCOSE RANGES		GLUCOSE VARIABILITY		DATA SUFFICIENCY			

* Reference ranges calculated from population without diabetes.

Curves/plots represent glucose frequency distributions by time regardless of date.

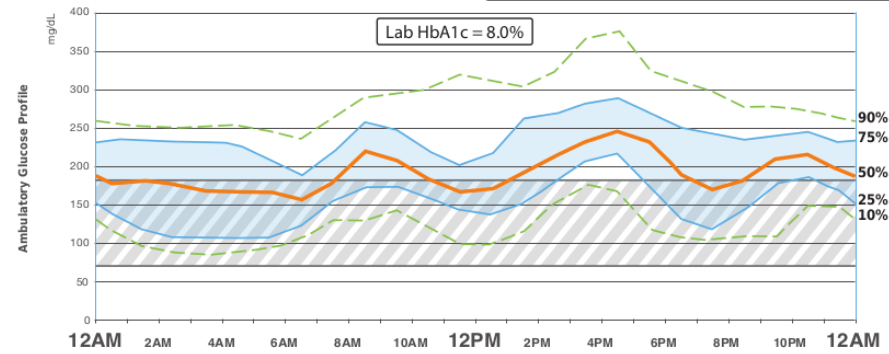


B. captürAGP® Patient 2 (14.0 days)

Glucose Statistics		Serious Low	Low	In Target Range	High	Serious High	SD	Coefficient of Variation	% Time CGM Active
Avg Glucose mg/dL	Estimated HbA1c	Below 54 mg/dL	Below 70 mg/dL	70 - 180 mg/dL	Above 180 mg/dL	Above 250 mg/dL	mg/dL	%	%
195	8.4%	0.1%	0.9%	43.6%	55.5%	20.6%	71	36.3%	96.6%
88 - 116 *	< 6 *	0 *	< 4 *	70 - 180 mg/dL > 90 *	> 180 mg/dL < 6 *	> 250 mg/dL 0 *	10 - 26 *	19.25 *	
GLUCOSE EXPOSURE		GLUCOSE RANGES		GLUCOSE VARIABILITY		DATA SUFFICIENCY			

* Reference ranges calculated from population without diabetes.

Curves/plots represent glucose frequency distributions by time regardless of date.

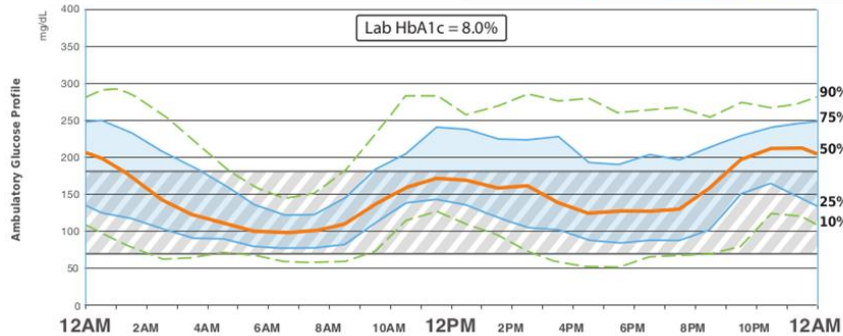


C. captürAGP® Patient 3 (14.0 days)

Glucose Statistics		Serious Low	Low	In Target Range	High	Serious High	SD	Coefficient of Variation	% Time CGM Active
Avg Glucose mg/dL	Estimated HbA1c	Below 54 mg/dL	Below 70 mg/dL	70 - 180 mg/dL	Above 180 mg/dL	Above 250 mg/dL	mg/dL	%	%
156	7.0%	4.4%	10.1%	54.5%	35.4%	11.3%	72	46.3%	70.6%
88 - 116 *	< 6 *	0 *	< 4 *	70 - 180 mg/dL > 90 *	> 180 mg/dL < 6 *	> 250 mg/dL 0 *	10 - 26 *	19.25 *	
GLUCOSE EXPOSURE		GLUCOSE RANGES		GLUCOSE VARIABILITY		DATA SUFFICIENCY			

* Reference ranges calculated from population without diabetes.

Curves/plots represent glucose frequency distributions by time regardless of date.

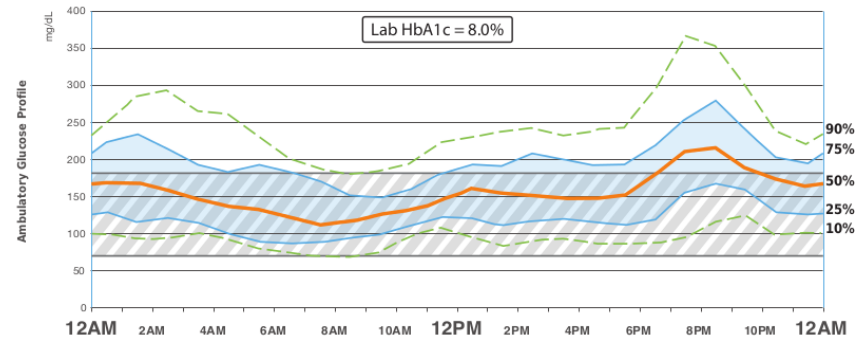


D. captürAGP® Patient 4 (14.0 days)

Glucose Statistics		Serious Low	Low	In Target Range	High	Serious High	SD	Coefficient of Variation	% Time CGM Active
Avg Glucose mg/dL	Estimated HbA1c	Below 54 mg/dL	Below 70 mg/dL	70 - 180 mg/dL	Above 180 mg/dL	Above 250 mg/dL	mg/dL	%	%
163	7.3%	0.5%	3.1%	63.8%	33.1%	9.8%	66	40.9%	98.1%
88 - 116 *	< 6 *	0 *	< 4 *	70 - 180 mg/dL > 90 *	> 180 mg/dL < 6 *	> 250 mg/dL 0 *	10 - 26 *	19.25 *	
GLUCOSE EXPOSURE		GLUCOSE RANGES		GLUCOSE VARIABILITY		DATA SUFFICIENCY			

* Reference ranges calculated from population without diabetes.

Curves/plots represent glucose frequency distributions by time regardless of date.



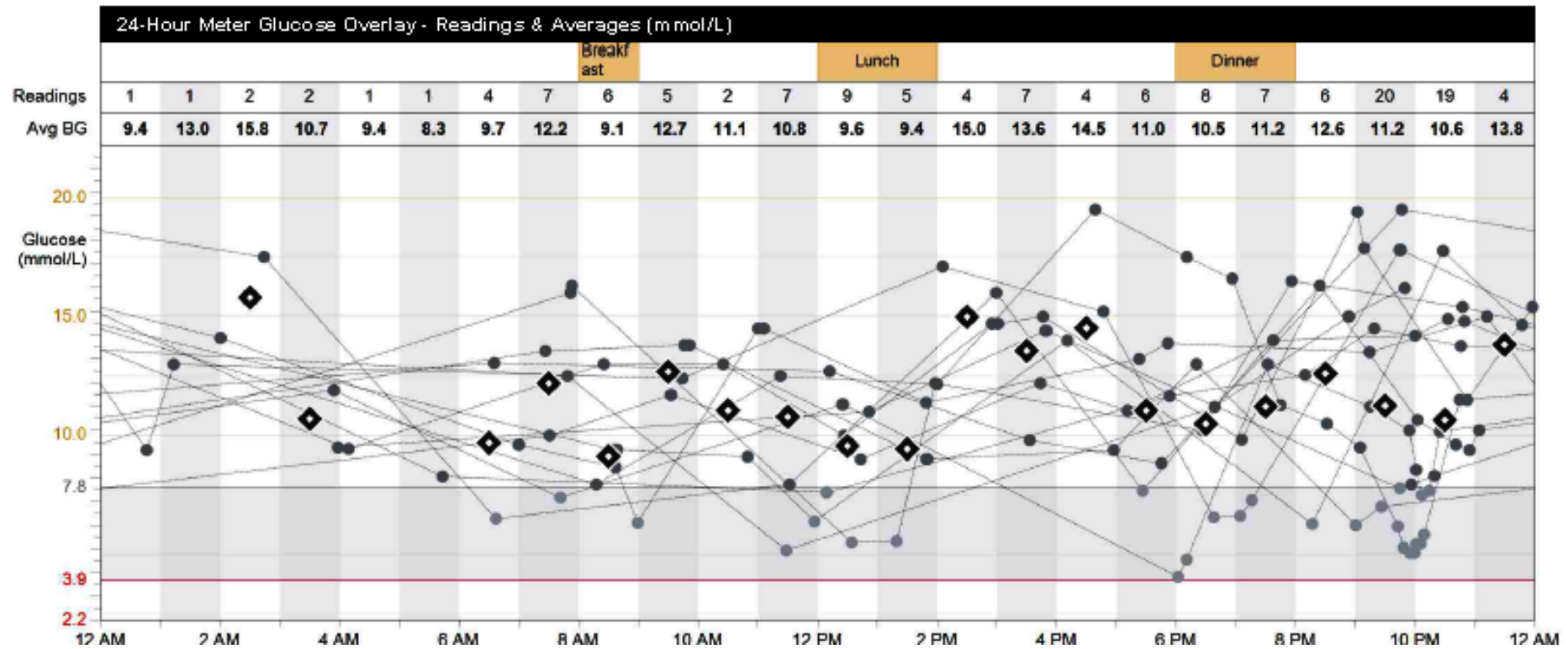
New CGM funding under NDSS

- Children and young people aged under 21 years with type 1 diabetes
- People with type 1 diabetes aged 21 years or older who have valid concessional status and have a high clinical need
- Women with type 1 diabetes who are actively planning pregnancy, pregnant, or immediately post-pregnancy
- Children and young people under 21 years with conditions very similar to type 1 diabetes who require insulin

‘Artificial pancreas’

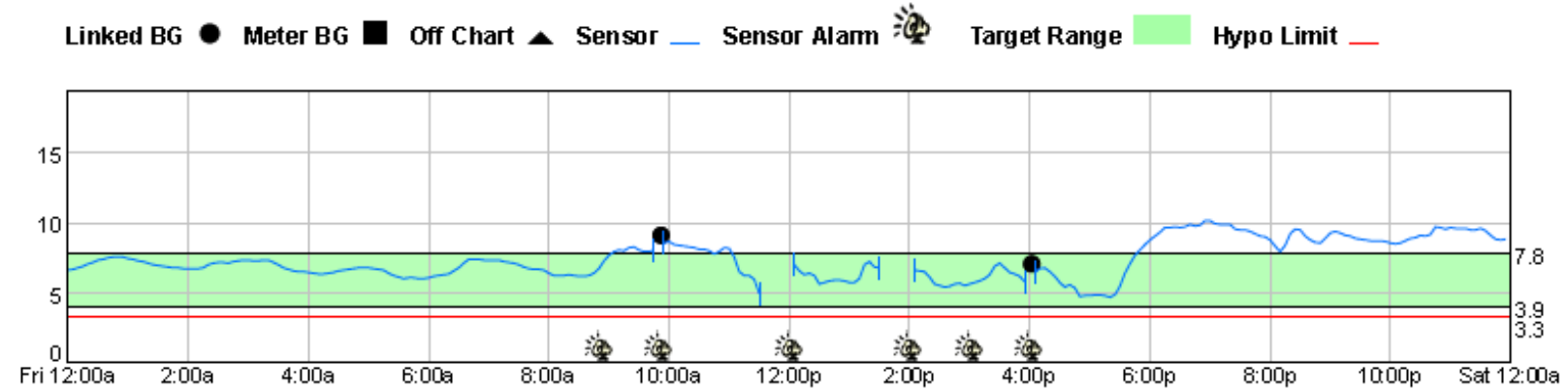


Before

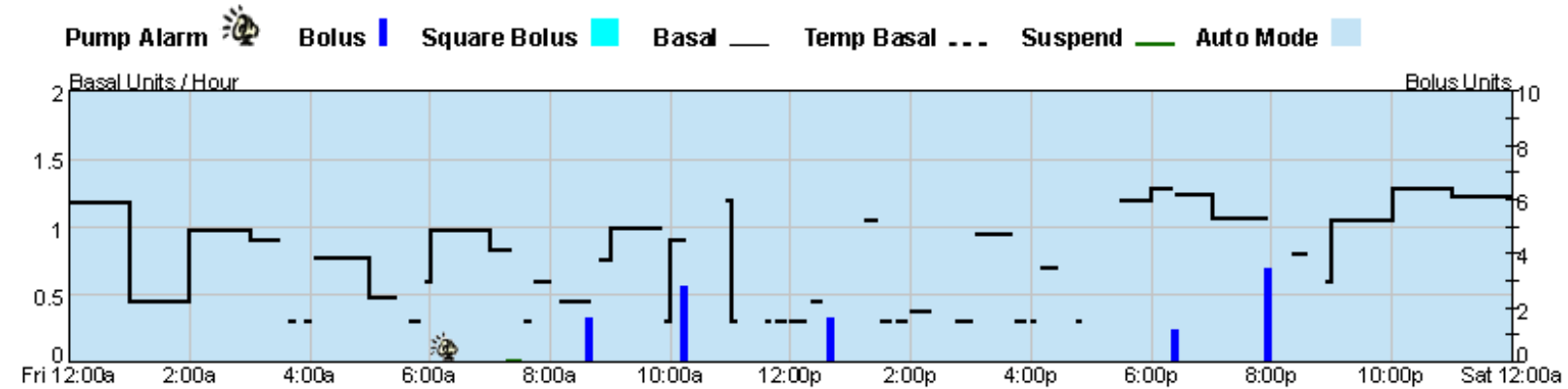


After

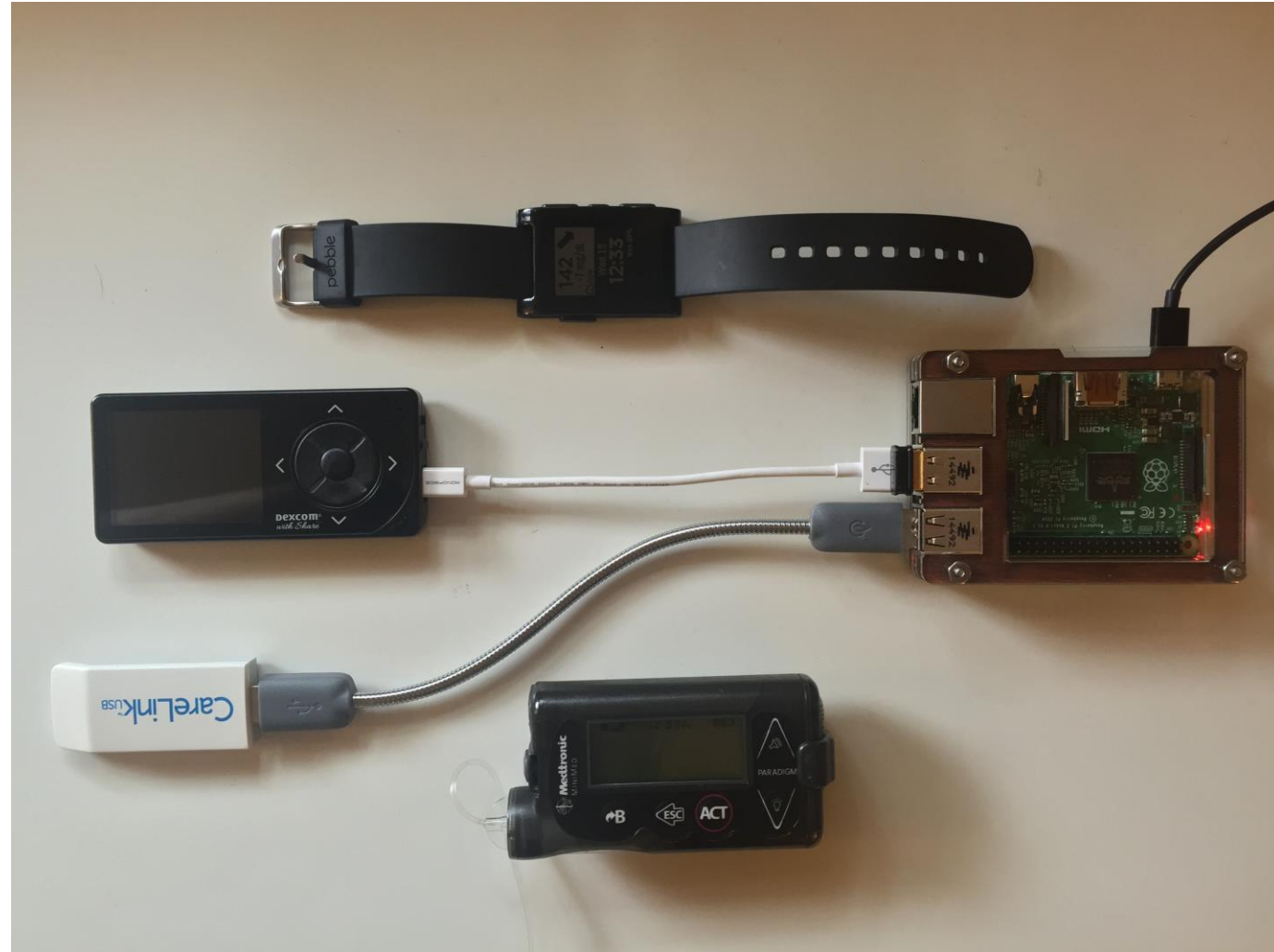
Glucose (mmol/L)



Insulin Delivery



DIY 'looping'



Dexcom G6



Zero fingersticks*

The Dexcom G6 CGM is FDA-permitted to make diabetes treatment decisions without confirmatory fingersticks or calibration.*

*If your glucose alerts and readings from the G6 do not match symptoms or expectations, use a blood glucose meter to make diabetes treatment decisions.



Glucose readings right on your smart device

Always know your number with just a quick glance at your smart device.[†] Trend lines show you where your glucose levels are headed and how fast they're getting there, so you can take action.



Customizable alerts and alarms

Set your optimal range and get notified when your glucose levels go too high or too low, and share your glucose data with up to five followers.[‡]

Say goodbye to weekly sensor self-insertions.

The first sensor approved for up to three months of use.

[FIND OUT HOW >](#)

Ever so...Hassle-free

Now FDA Approved!

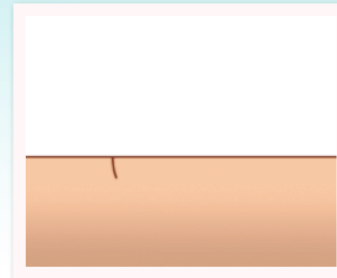


Features & Functions

- ✓ Sensor lasts up to 3 months — no weekly sensor insertions
- ✓ Professional insertion procedure
- ✓ Fully implanted with no sensor part showing through the skin
- ✓ Accurate over the 3-month period with a MARD of 8.5%*

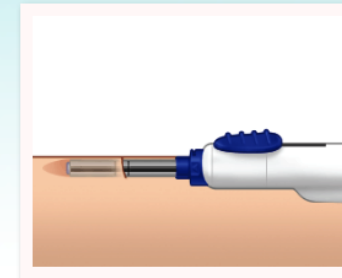
Professional Insertion Procedure

1. Make Incision



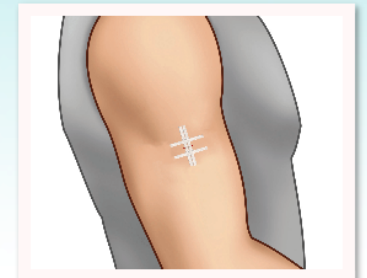
~5 mm Incision in upper arm under local anesthetic

2. Insert Sensor



Sensor inserted with custom inserter

3. Close insertion site



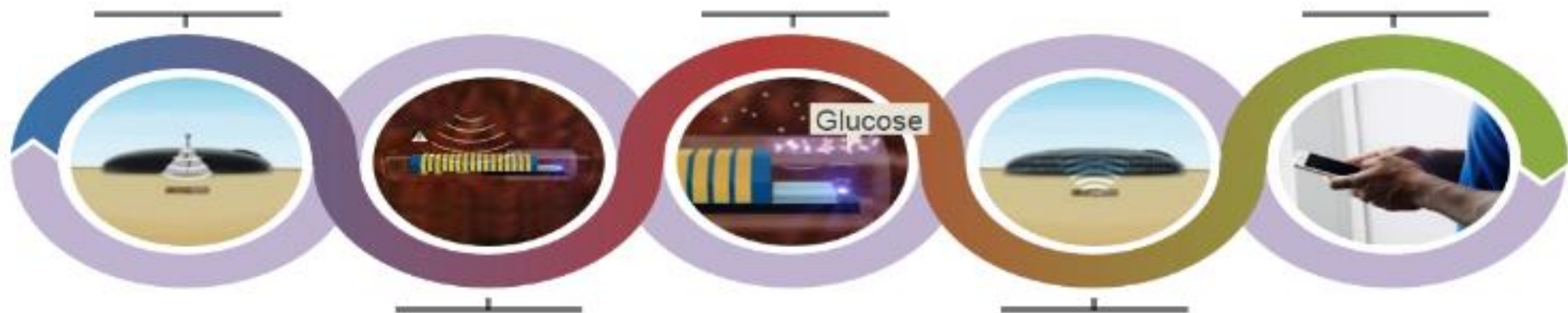
Steri-Strips™ to close

How Eversense Works

Body-worn transmitter
wirelessly powers
subcutaneous sensor

Polymer on sensor surface
fluoresces if glucose
present

Transmitter sends
sensor glucose value,
trend, & alerts to mobile
device



Sensor antenna receives
RF energy from transmitter
to power device

Sensor returns data
to transmitter –
glucose value calculated

Insulin bolus calculators (‘smart meters’)

Settings: correction factor
 carbohydrate ratio
 insulin duration

Inputs: ambient BGL
 insulin dose
 carbohydrate content

Last values

Last blood glucose
29/05/18 5:53 PM

 **7.3** mmol/L

Last carbohydrates
28/05/18 5:40 AM

 **60** g

Last bolus


--- U

Current basal rate

 --- U/h

Insulin on board

 --- U

 Last mylife Cloud sync
24/05/18 9:33 AM



 YpsoPump state
connecting...



Ketone monitors

