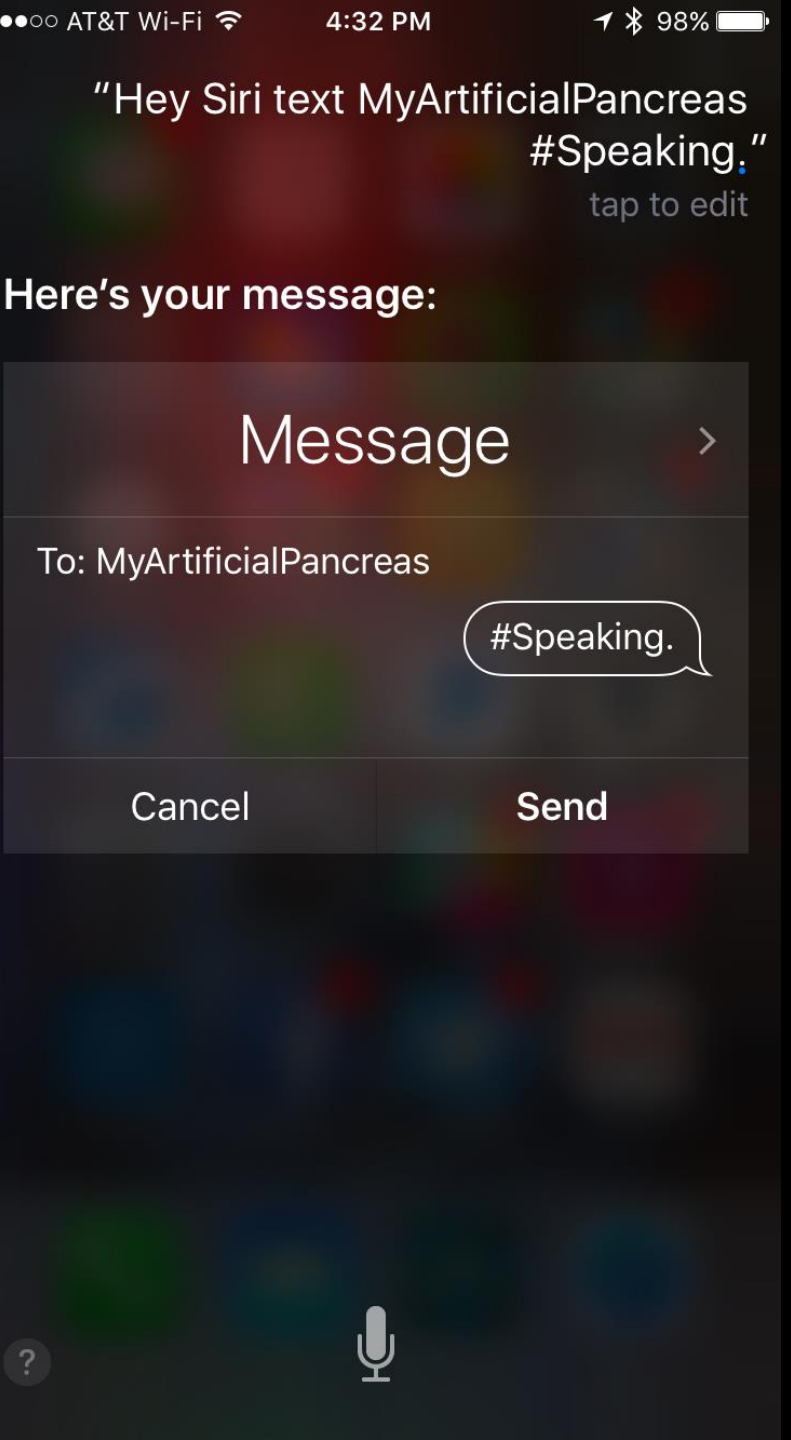
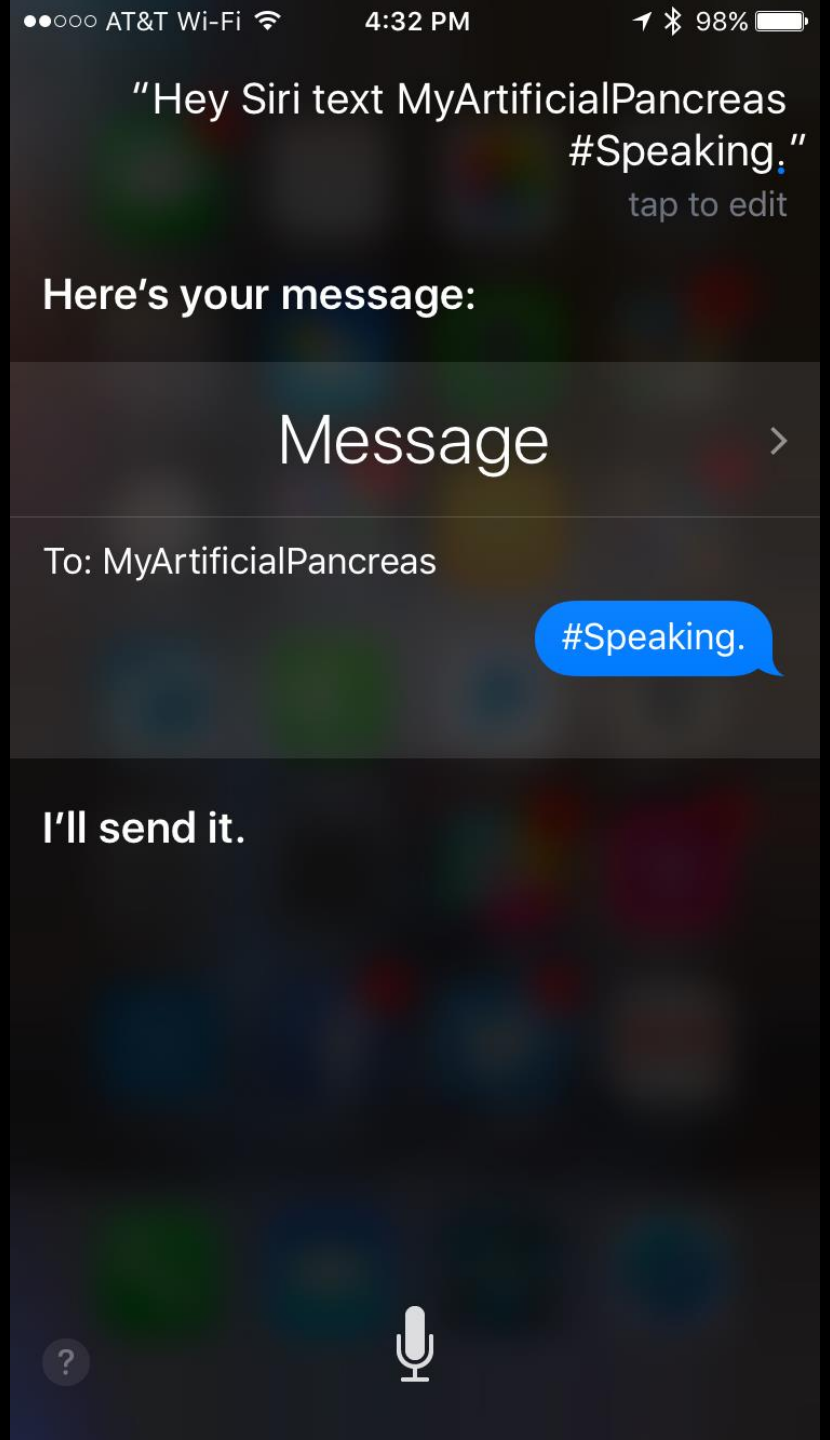
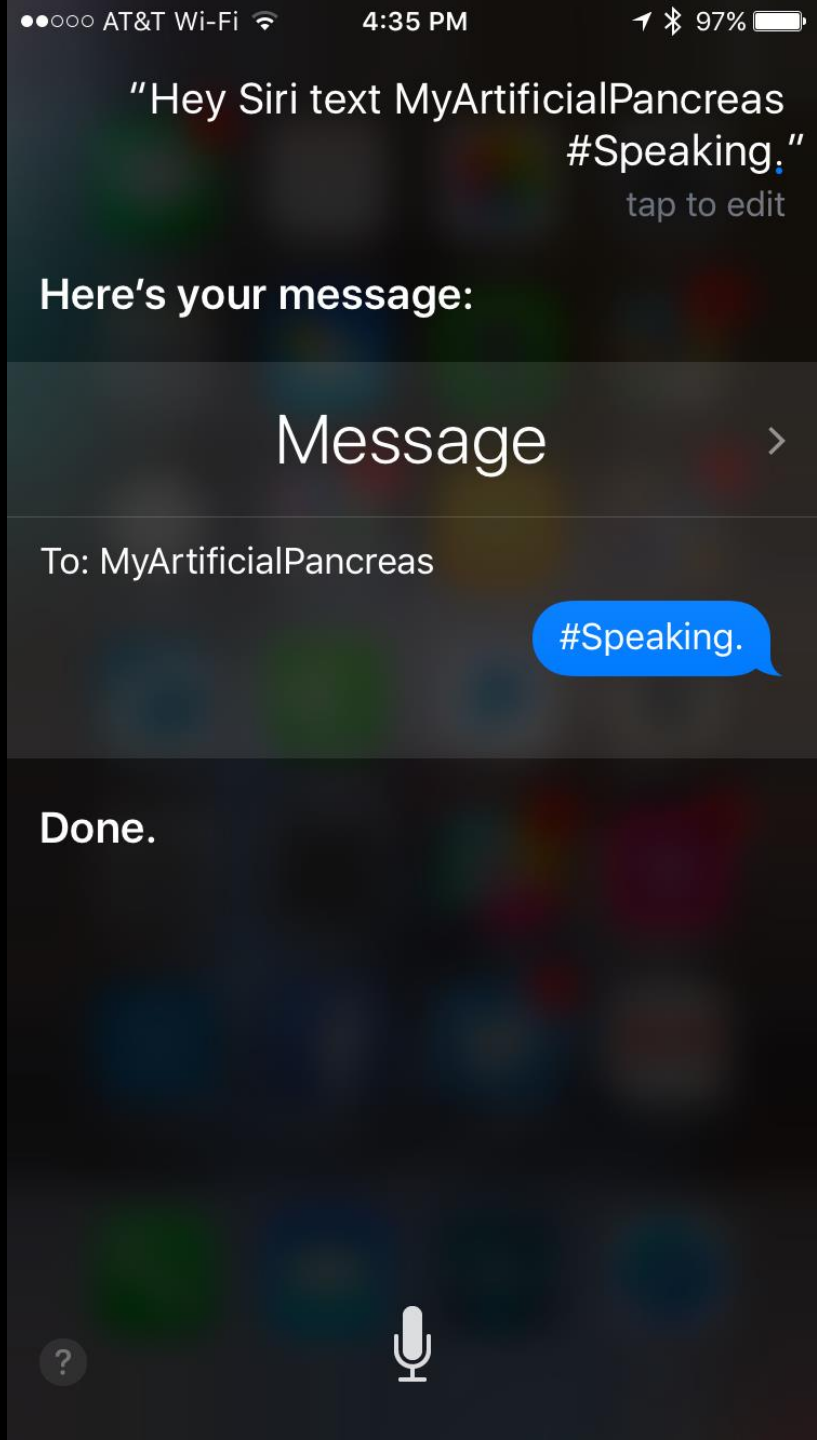
Why (and how)
I built an artificial pancreas

@DanaMLewis


●●○○ AT&T Wi-Fi
4:32 PM
98%
"Hey Siri text MyArtificialPancreas #Speaking."
tap to edit
Here's your message:
Message
To: MyArtificialPancreas
#Speaking.
Cancel
Send


●●○○○ AT&T Wi-Fi
4:32 PM
98%
"Hey Siri text MyArtificialPancreas #Speaking."
tap to edit
Here's your message:
Message
To: MyArtificialPancreas
#Speaking.
I'll send it.


●●○○○ AT&T Wi-Fi
4:35 PM
97%
"Hey Siri text MyArtificialPancreas #Speaking."
tap to edit
Here's your message:
Message
To: MyArtificialPancreas
#Speaking.
Done.

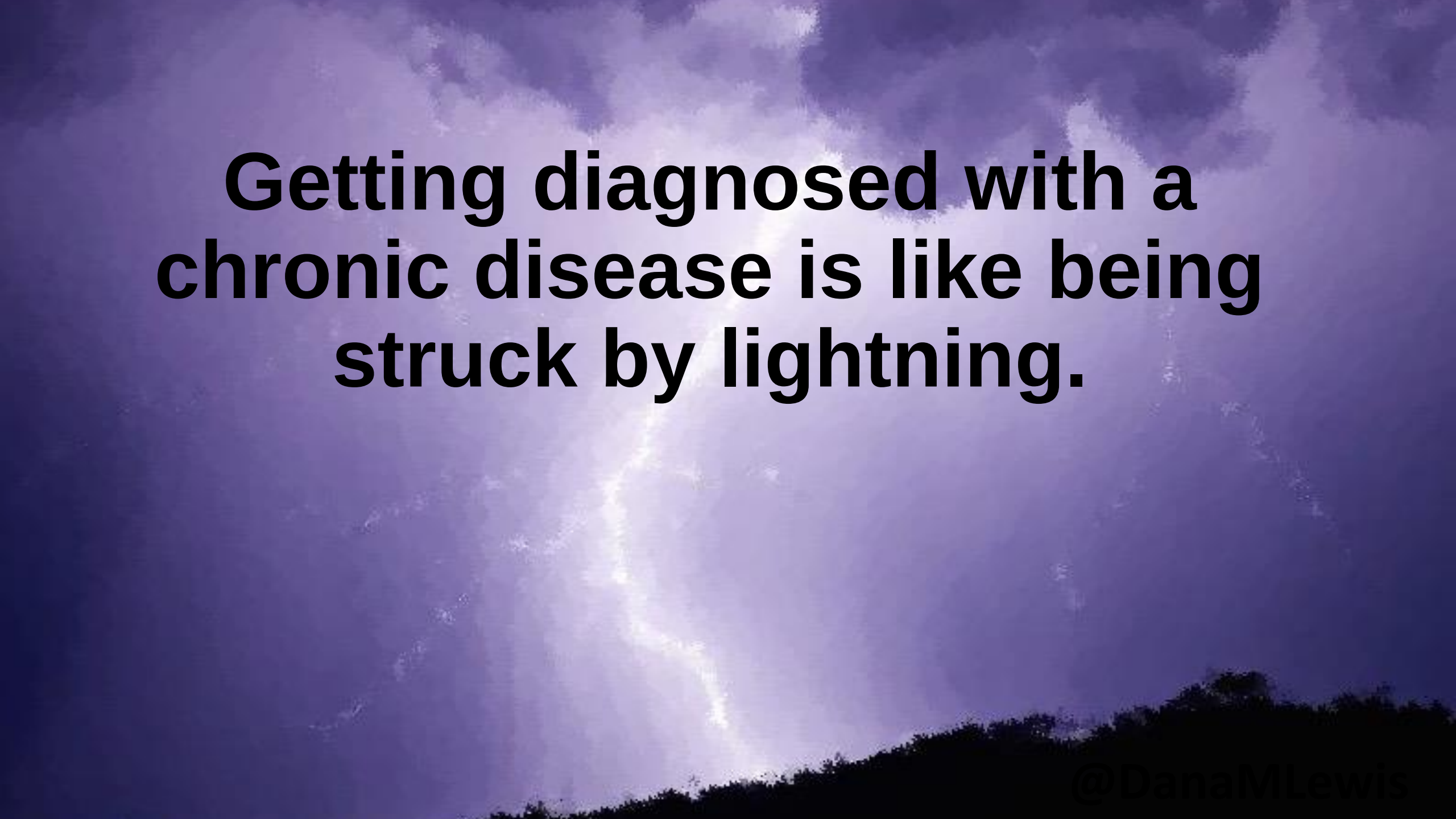
This is not about
how cool it is
(though it is!)
to text my pancreas.

This is about what's possible when you & I *decide to stop waiting*.

I’m not:

An Engineer
A Programmer
A Developer
A Rocket Scientist
Unique

I’m just a girl,
standing in front of the world,
telling you I was tired
of the daily burdens
of type 1 diabetes.


Getting diagnosed with a chronic disease is like being struck by lightning.
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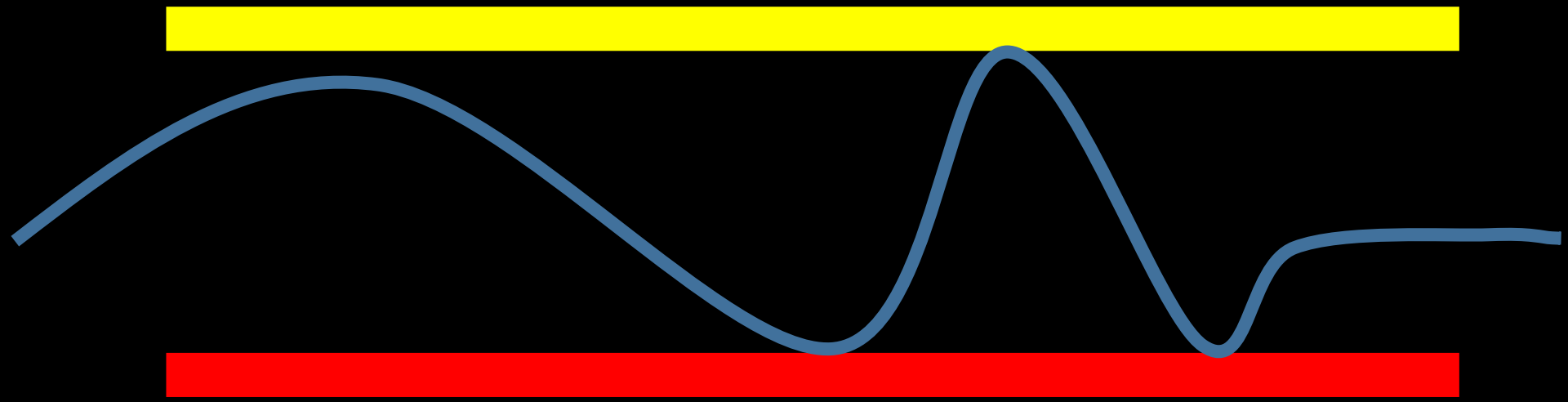
Food, hormones, sickness, stress



Insulin, exercise, sickness, stress

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“Diabetes is the ultimate DIY. *It has to be* – people make up to 300 decisions daily that impact their blood glucose.”

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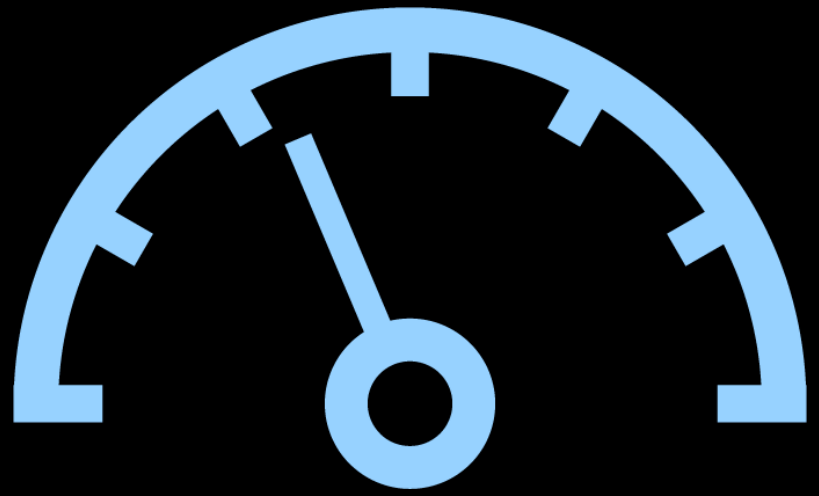
Adding technology is like going from driving stick shift to driving an automatic.



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Cruise control is great, but a self-driving car is even better.

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An artificial pancreas is the closest thing to a self-driving car for diabetes.

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…in 2014, an artificial pancreas was not yet commercially available.

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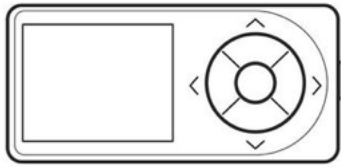
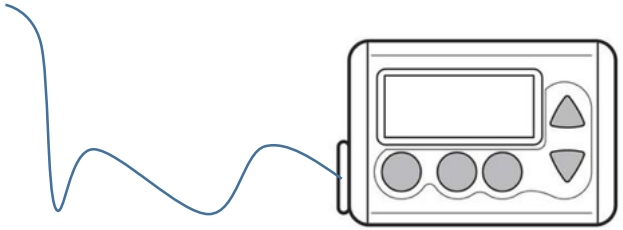
The tools I had were not perfect….

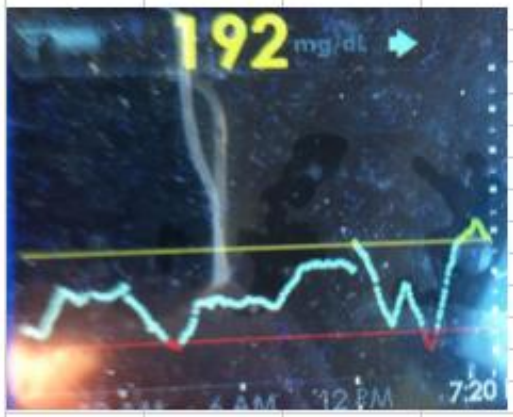


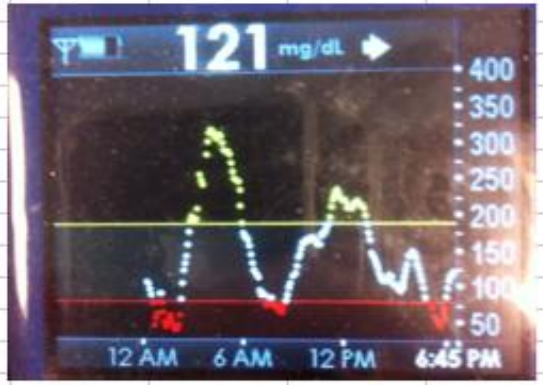
Continuous Glucose Monitor (CGM)

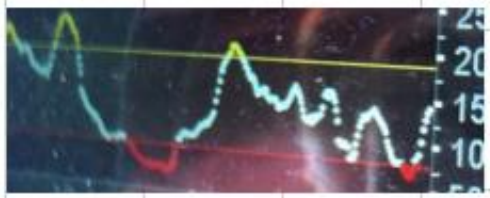


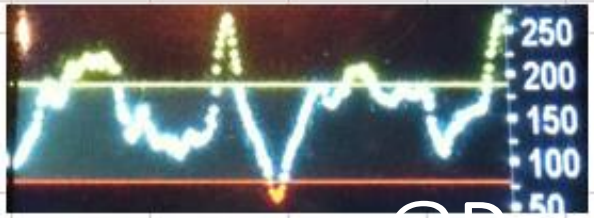
Insulin Pump

Leaving me often with this:

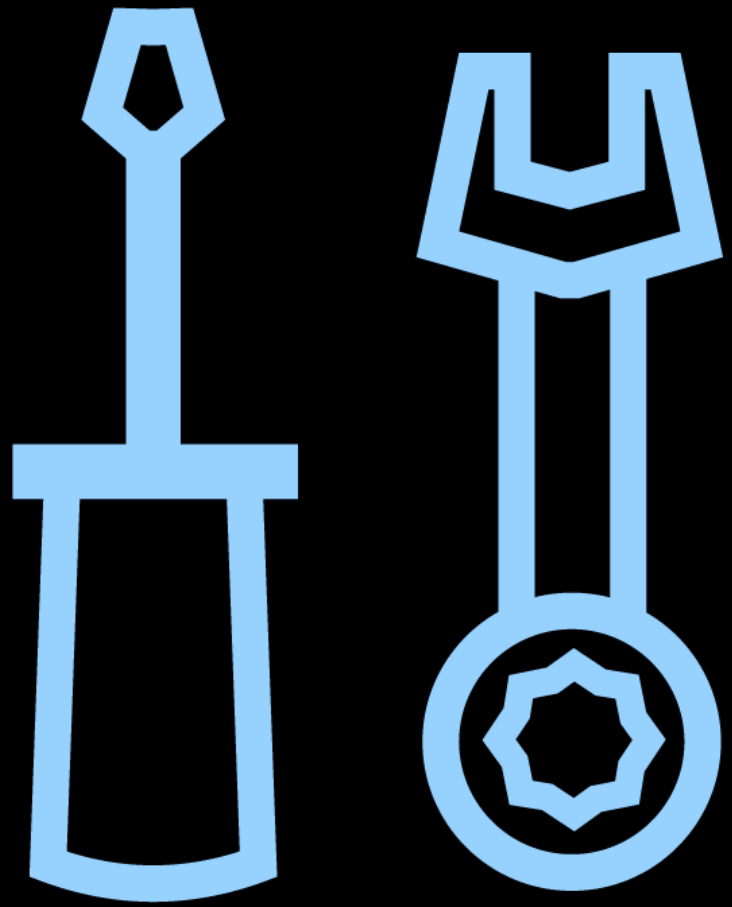








4-Jul	7-Jul
salad	banana
frozen dinner	hamburger, salad, ice cream
cheese & crackers	steak/rice/beans bowl
	7/8 - 4 mile run, transmitter died
5-Jul	9-Jul
bacon & eggs	bacon & eggs
chicken & rice	tomato soup
larabar & sausage	cheese & crackers
6-Jul	10-Jul
banana	yogurt
doritos	bacon & eggs
ham/cheese lettuce wrap with yogurt, cheetos	
steak & potato	chicken & rice



If we can't change existing devices…

what if we could add *new* tools?

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Tackling the problem of less-audible alarms:

- Get data from device with open source code
- Display data & generate louder alarms
- Share data with loved ones
- Enter specific actions/more buttons
- Create forecast (algorithm) with data sources
- Add additional “smart” alarms with action recommendations

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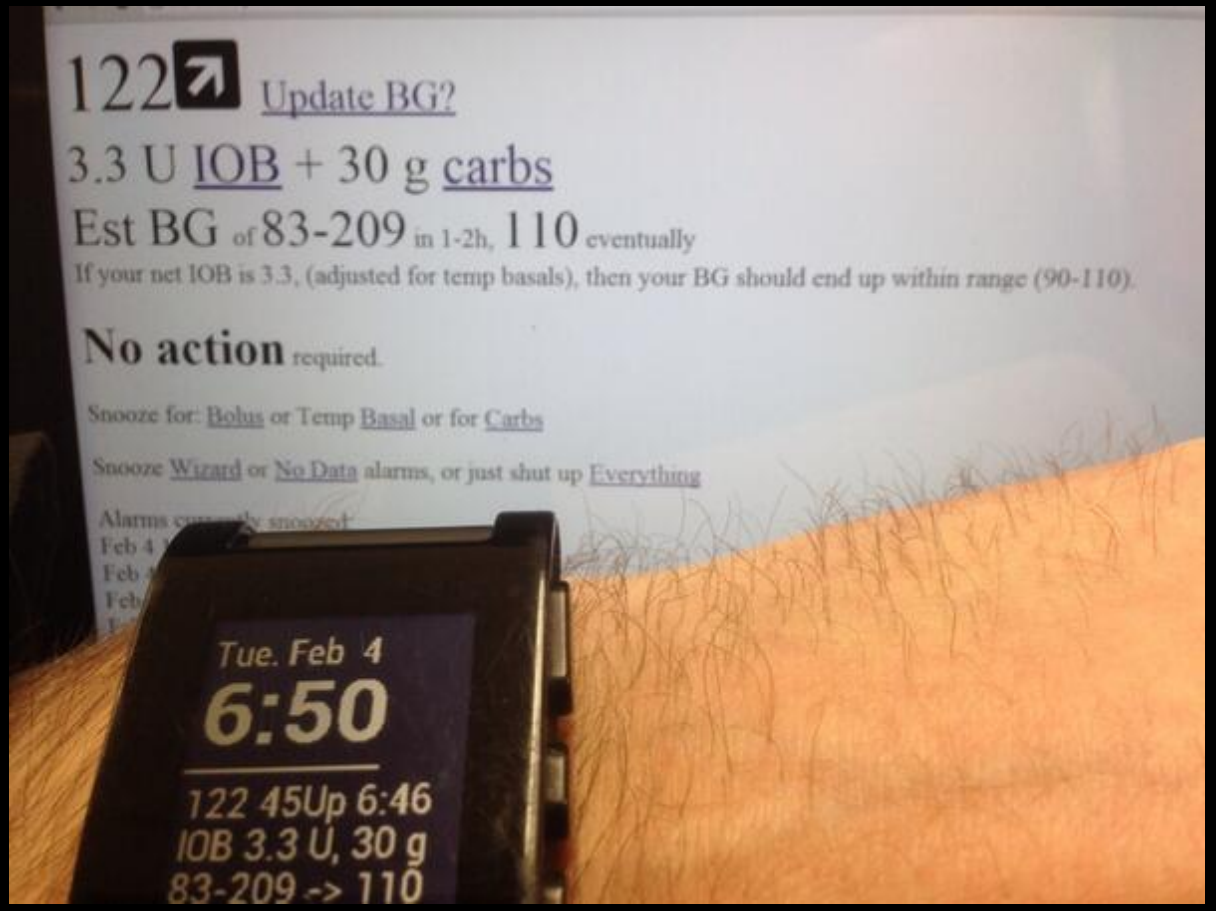
From reactive to predictive: an “open loop”



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Original #DIYPS features

- Real-time processing of BG, insulin on board, carbohydrate decay
- Customizable alerts based on CGM Data + trends
- Real-time predictive alerts for FUTURE high/low BGs (hours in advance)
- Continually updated recommendations for insulin (bolus or temp basal) + carbs
- Includes “Activity”, “sensitivity”, “resistance”, “eating soon”, and “night” modes

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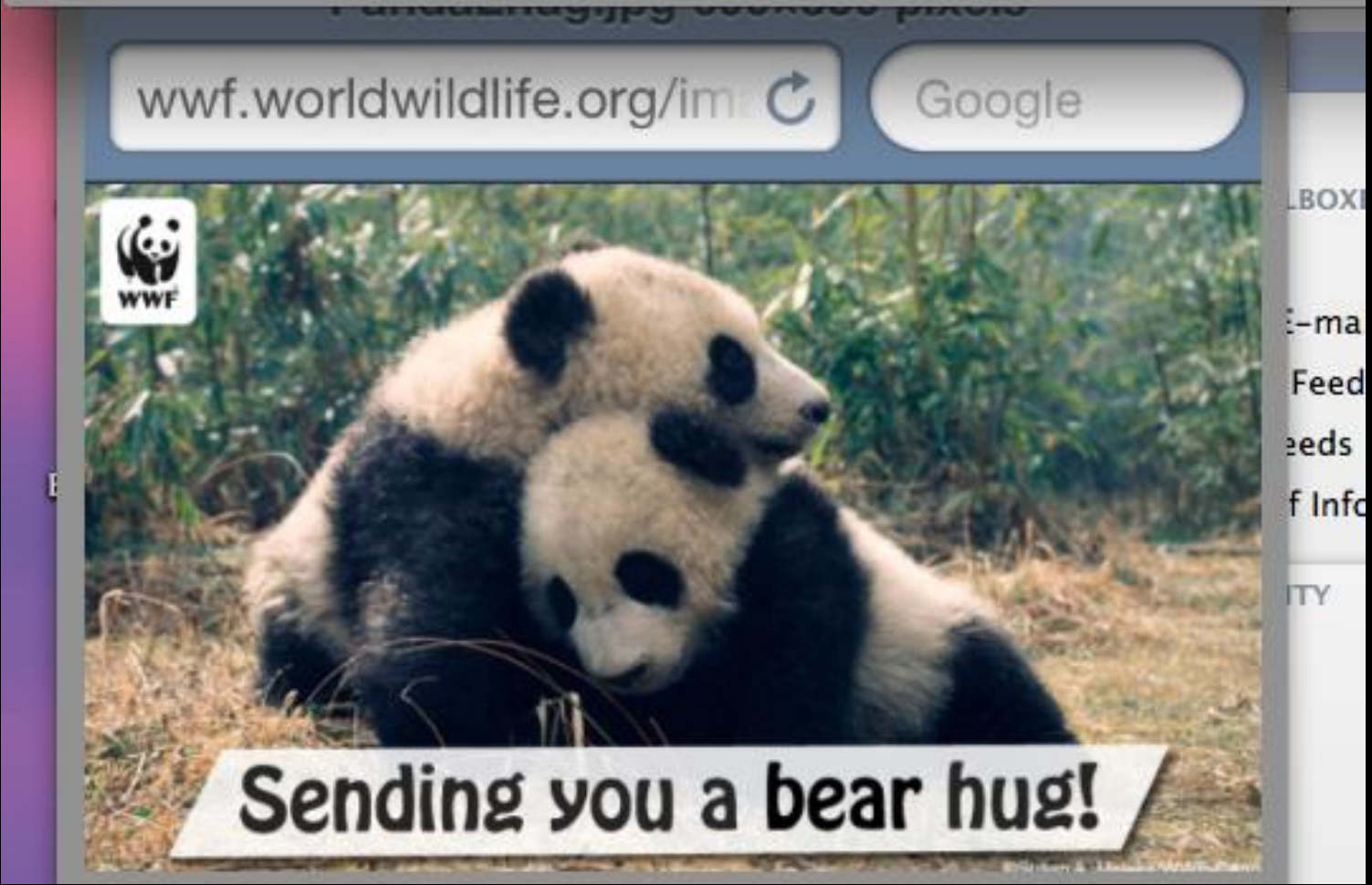
34 carbs and 1 hug recommended

Snooze for: Bolus or Temp Basal or for Carbs



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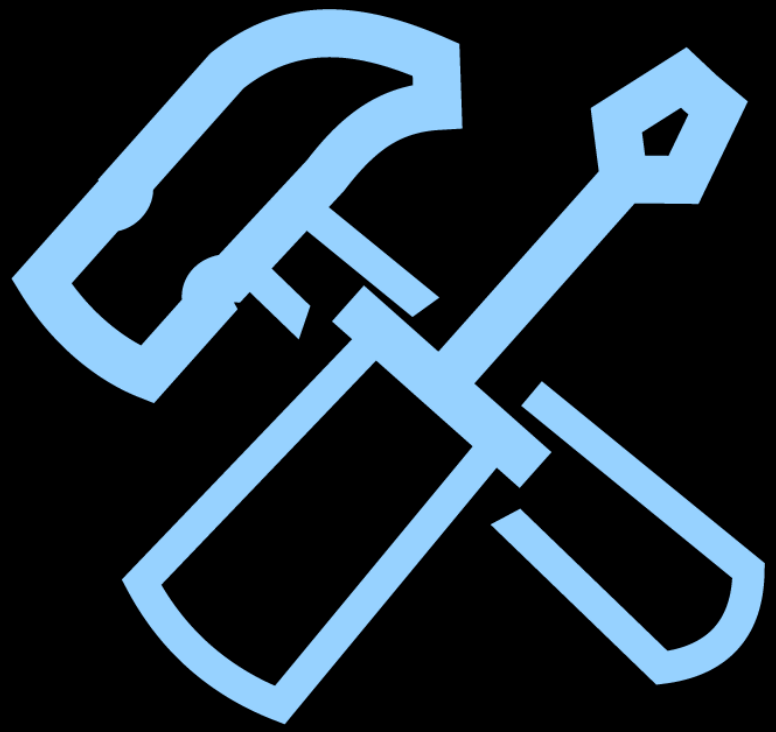

And it turns out….

We already had in our pockets the tools needed for an “artificial pancreas”.

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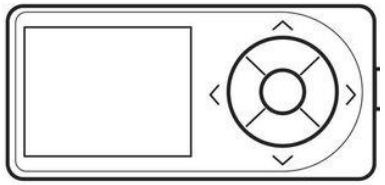
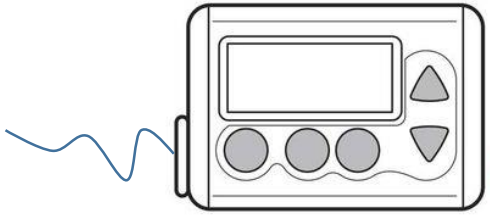
Components of an open source artificial pancreas





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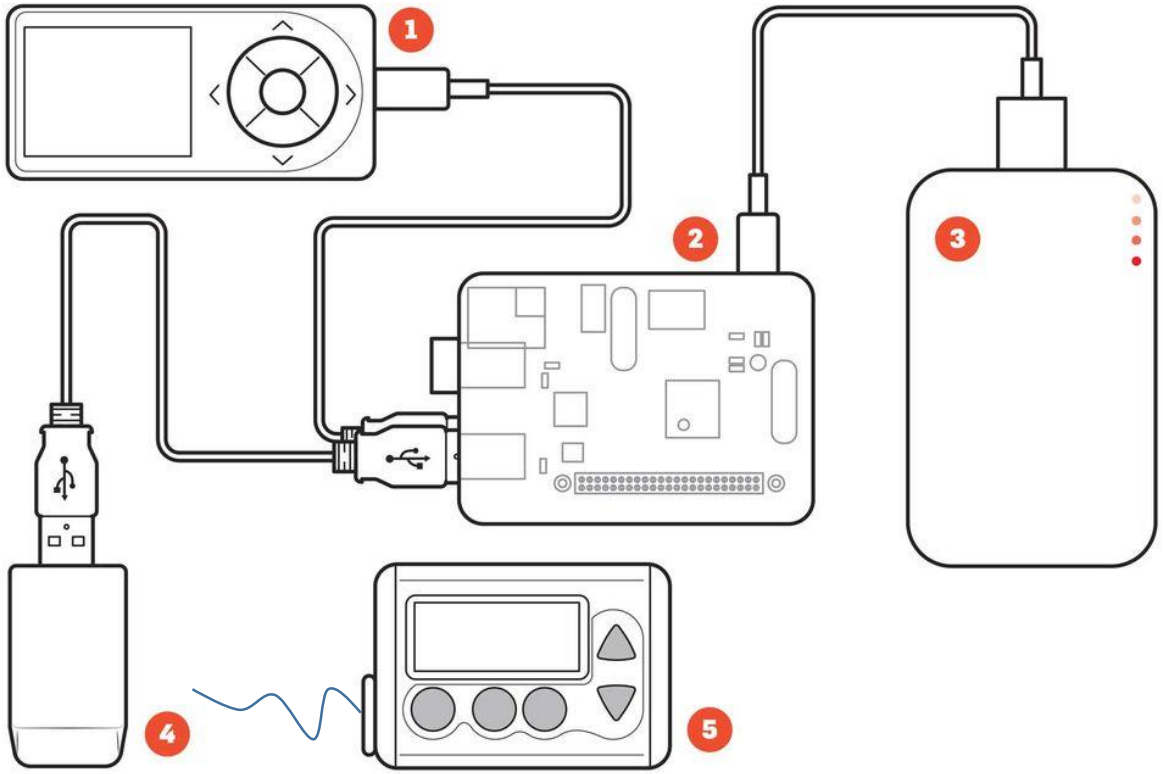
Components of an open source artificial pancreas



1. Continuous glucose monitor
2. Computer
3. Battery
4. Radio stick
5. Insulin pump

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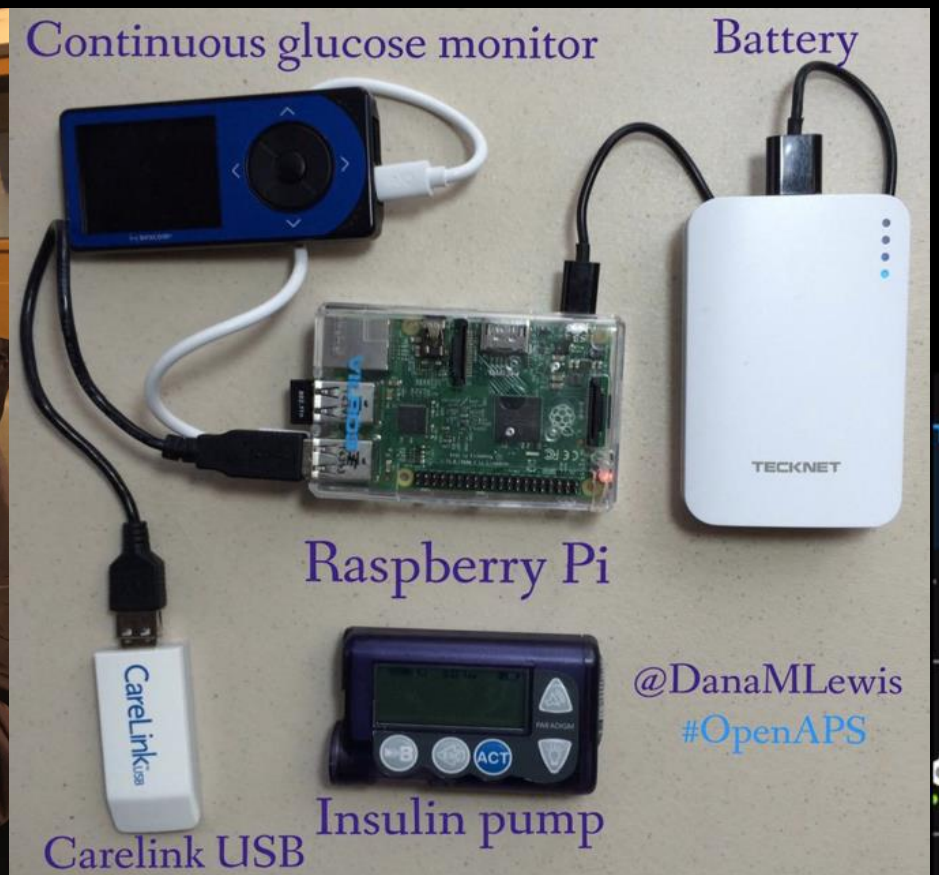
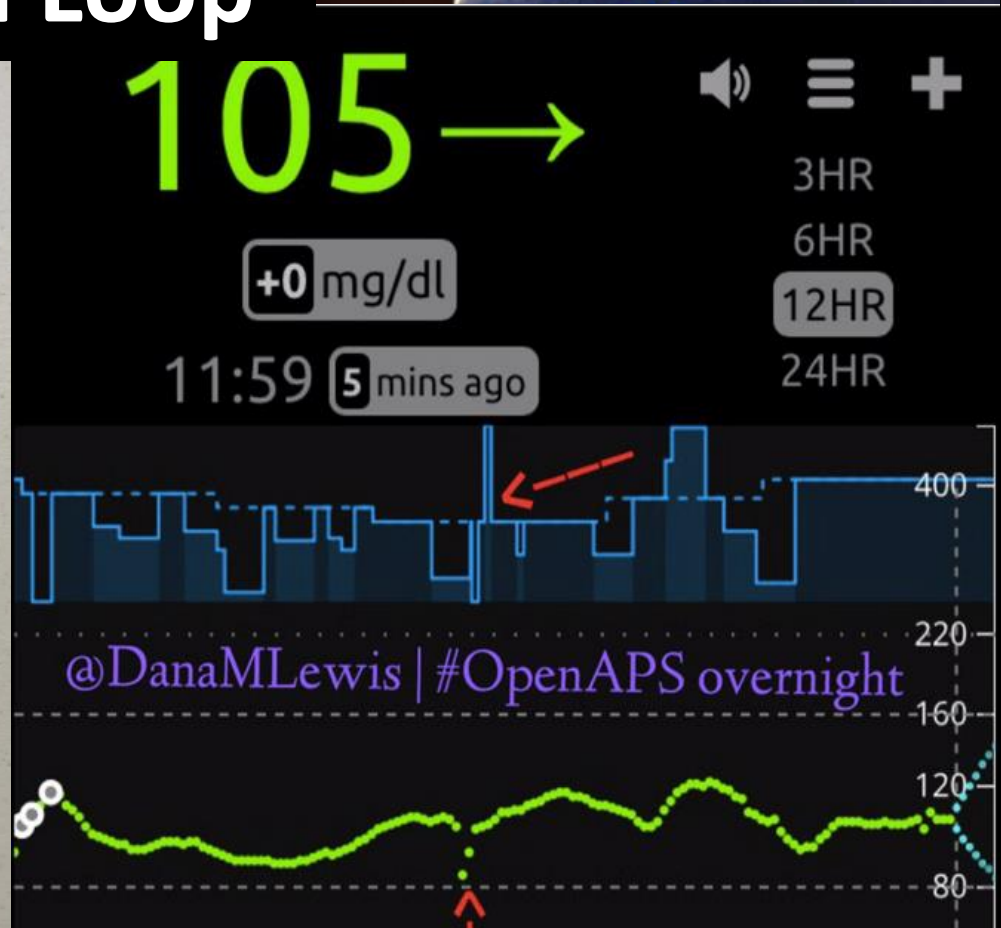
Life with a DIY Closed Loop





#OpenAPS

is an open and transparent effort to make safe and effective basic Artificial Pancreas System (APS) technology widely available to reduce the burden of Type 1 diabetes.

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There are now (n=1)*369+ people with DIY closed loops in the world.

(That's something like

1,650,000+

hours of DIY closed loop experience.)

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A hybrid closed loop artificial pancreas is great…

- It auto-adjusts basal rates every 5 minutes
- It responds more precisely than humans would
- It doesn't sleep ☺, so people with diabetes can.

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... although not a cure,
it makes it a lot better
than it used to be.

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But what if:

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We all started using technology to make small, incremental changes that yield large quality of life improvements?

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We stopped requiring every solution to work for everyone, and waiting for perfection before helping those who can be helped now?

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We stopped waiting for everyone else to be or find the solution(s).

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What if we all say #WeAreNotWaiting?

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Say “#WeAreNotWaiting” about something small.

(Changing something is better than changing nothing.)

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Why did I build an artificial pancreas?

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Because #WeAreNotWaiting to:

- Change how I sleep at night
- Change diabetes care for all
- Change healthcare.

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What are YOU waiting for?

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