Automated Insulin Delivery

Automated insulin delivery is quickly approaching with a few products already available. It is known by many names – artificial pancreas, hybrid closed loop, and Bionic Pancreas – to name a few. It includes a glucose measuring device (such as a CGM) and an insulin pump. The glucose measuring device senses glucose levels and then communicates with the pump using a computer-controlled algorithm. The pump, then, responds by increasing or decreasing the flow of insulin to keep blood glucose values in range.

The first generation of the artificial pancreas, Medtronic's MiniMed™ 670G, is currently available. Medtronic has developed its own algorithm where the insulin pump adjusts insulin continuouslybased on numbers provided every five minutes by the CGM. It's known as a **hybrid** closed-loop system because you still need to check blood glucose levels with a meter to calibrate the CGM. You also need to enter the amount of carbs eaten at each meal into the pump. It has, however, increased time in range. Additionally, it has prevented the number of lows people experience because of its ability to predict when a low might occur. Medtronic is now working on the next generation of this system.

The Future of Artificial Pancreas

The University of Virginia has developed their own algorithm and is allowing other companies to use it to develop their own closed loop systems. The Dexcom G6 will use this algorithm with a Dexcom CGM and a T-slim pump. With the Dexcom G6, no fingersticks are required. Omnipod is also working on a trial with this algorithm.

There are other companies continuing to work on artificial pancreas advancements. Bigfoot Biomedical is working on a system that uses Abbott's Freestyle Libre flash monitoring system, a pump, and a smartphone. Boston University is working on a Bionic Pancreasthat automatically makes decisions about insulin (to lower sugar levels) and glucagon (to raise sugar levels) delivery every five minutes.

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physician.

Recommended

Using an Insulin Pen

Rotating Injection Sites

Tracking and Reviewing Blood Glucose Data

External Resources

Companion Medical – InPen

Recommended

Hybrid Closed Loop

Sources

Automated Insulin Delivery, diaTribe

Medtronic MiniMed™ 670G

UVA Artificial Pancreas

Dexcom G6®

Omnipod®

Bionic Pancreas

Bigfoot Biomedical