

[Bruce Soloway, MD](#) reviewing El-Khatib FH et al. Lancet 2016 Dec 19. Murphy HR and Stewart ZA. Lancet 2016 Dec 19.

In a small trial, home use of the device improved glycemic control with minimal patient input.

Currently available devices that link insulin pumps to continuous glucose monitors (CGMs) still require patients with diabetes to check their blood glucose regularly, count calories, and review and approve bolus insulin doses. Automated systems requiring less patient intervention have been investigated mainly in highly controlled settings and have required substantial individual programming.

In this government-funded randomized crossover trial, investigators assigned 39 adults with type 1 diabetes that was managed with insulin pumps (with or without CGMs) to spend 11 days using a “bionic pancreas” (a CGM linked to an algorithmically-controlled insulin-glucagon pump; [NEJM JW Gen Med Aug 1 2014](#)

and

N Engl J Med

2014; 371:313) and another 11 days using their baseline method of glycemic control while also wearing CGMs that provided data only to investigators. The bionic pancreas was initialized with only the patient's body mass, did not require patient input at mealtimes, and adapted its dosing algorithm iteratively based on the patient's glycemic responses. Participants had no restrictions on diet or exercise and continued most of their usual daily activities.

The mean CGM glucose concentration was significantly lower during the bionic pancreas period than during the comparator period (140 mg/dL vs. 162 mg/dL). Nevertheless, the mean percentage of time that participants were hypoglycemic (glucose concentration <60 mg/dL) was lower during the bionic pancreas period (0.6% vs. 1.9%). Patients experienced slightly more nausea during the bionic pancreas period, but no serious adverse events occurred.

COMMENT

The term “bionic pancreas” might still seem a bit hyperbolic, but the technology appears to be approaching this ideal. Longer trials with more diverse patient populations are needed.

CITATION(S):

1. El-Khatib FH et al. Home use of a bihormonal bionic pancreas versus insulin pump therapy in adults with type 1 diabetes: A multicentre randomised crossover trial.

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2. Murphy HR and Stewart ZA. Automated insulin delivery: What's new, needed, and next?

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