

# Closed-loop insulin delivery systems may improve blood sugar control in children with type 1 diabetes

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Closed-loop insulin delivery systems improve glucose control in children with type 1 diabetes without causing adverse effects, according to a

study presented Saturday at ENDO 2023, the Endocrine Society's annual meeting in Chicago, Ill.

A closed-loop system consists of devices that use a continuous glucose monitor and insulin pump to automatically regulate [blood sugar levels](#) for people with diabetes. The system operates "closed-loop" because it continuously monitors and adjusts (starting and stopping) insulin delivery based on the person's blood sugar levels, without the need for manual intervention.

The first closed-loop system was approved for pediatric use in the United States in 2020. Since then, many randomized [clinical trials](#) have been performed on closed-loop systems. However, according to study researcher Amanda Godoi from Cardiff University in the United Kingdom, until now no [review of studies](#) evaluating the effect of prolonged use of closed-loop systems on glucose levels in children and adolescents with type 1 diabetes has been performed.

"Treatment of type 1 diabetes in children is a clinical challenge," Godoi said. "We found using closed-loop systems led to improved [glucose control](#), which represents an important treatment opportunity to reduce complications and morbidity in children with type 1 diabetes."

The researchers reviewed nine studies of randomized controlled trials lasting at least 12 weeks comparing closed-loop systems to usual care in a total of 892 children with type 1 diabetes. Usual care is the delivery of insulin through multiple daily insulin injections or sensor augmented pumps, which are commonly used in treating diabetes. These are not automated and thus require the patient to monitor blood sugar levels and adjust the insulin delivery accordingly.

The children and teens using a closed-loop system had a small important 0.35% reduction in HbA1c levels—a blood test that measures average

blood sugar levels over the past three months. They also had an average 9.96% increase in time in an optimal glucose range, without increasing the risk of adverse effects such as hypoglycemia (too-low blood sugar) and diabetic ketoacidosis (a serious complication of diabetes that develops when the body cannot produce enough insulin).

"Our results show that closed-loop technology seems to be safe and superior to usual care in controlling [glucose levels](#)," Godoi said.

**More information:** Conference livestream at [endomediastream.com](https://endomediastream.com).

Provided by The Endocrine Society

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