

Diabetes study helps families sleep easier

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Two Western professors hope their clinical trial will soon lead to eliminating overnight dangers for children with Type 1 diabetes.

Schulich School of Medical & Dentistry professors Drs. Cheril Clarson and Irene Hramiak, both Lawson Health Research Institute scientists, are leading the only Canadian study evaluating a tool for preventing low blood sugars in [diabetes](#) patients while they sleep.

Low [blood sugar](#), or hypoglycemia, is a condition that can lead to coma, seizures or death for individuals with diabetes. More than half of these episodes occur during sleep hours and, in children, the rate is even higher, with 75 per cent of hypoglycemic seizures occurring overnight.

And the number of children being diagnosed each year with Type 1 diabetes – 1 in 500 – has doubled over the last few decades, Clarson said.

"If this system reduces nighttime hypoglycemia, and improves quality of life for children with diabetes and their families, it will also help patients to achieve better diabetic control and reduce the risk of long-term complications from diabetes," she added.

Currently in use, pumps help to reduce the risk of hypoglycemia by administering constant levels of insulin. However, they rely on the user to monitor their blood sugar levels and adjust as necessary – a manual task that cannot be performed while sleeping.

In the trial, Clarson and Hramiak are testing a tool that mimics the pancreas to reduce the rate of nocturnal hypoglycemia. It combines a pump to deliver insulin, a continuous glucose-monitoring system to measure blood sugars in the patient every five minutes and a computer algorithm that predicts when each individual is at risk for hypoglycemia.

Clarson said the idea is for the tool is to avoid low blood sugar by turning the insulin pump off when it predicts high risk for low-blood sugar, and then back on when the risk has been resolved.

"This study combines two technologies that have been used for quite a few years," Clarson said. "But there is no commercially available system that is fully functional, or closed loop, which is what a pancreas would be doing. This is where we're heading.

"This is a step forward because it is predicting low blood sugar, and it is much better to prevent [low blood sugar](#) than to have severe symptoms that often occur when the blood sugar shoots up. It's much better to prevent that from happening."

A previous trial, led by Hramiak, studied 45 adult patients age 15-45 years and yielded positive results, helping participants keep blood sugar levels stable while patients slept.

"It's a simple solution to a major problem for individuals wearing an insulin pump," Hramiak said. "We have tested the system in adults and now are testing it in a group of 20 children ages 3-15. This system could potentially prevent overnight [hypoglycemia](#) and is a first step to developing a system that functions like a native pancreas."

Provided by University of Western Ontario

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