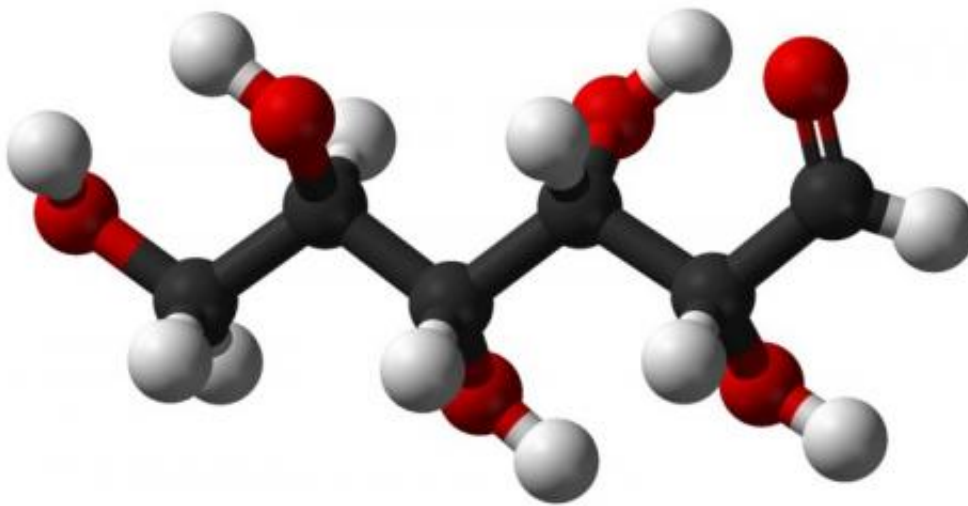


New algorithm uses artificial intelligence to help manage type 1 diabetes

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Glucose C₆H₁₂O₆. Credit: Wikipedia.

Researchers and physicians at Oregon Health & Science University, using artificial intelligence and automated monitoring, have designed a method to help people with type 1 diabetes better manage their glucose levels.

The research was published in the journal *Nature Metabolism*.

"Our system design is unique," said lead author Nichole Tyler, an M.D.-Ph.D. student in the OHSU School of Medicine. "We designed the

AI algorithm entirely using a mathematical simulator, and yet when the algorithm was validated on real-world data from people with type 1 [diabetes](#) at OHSU, it generated recommendations that were highly similar to recommendations from endocrinologists."

That's significant because the people with diabetes typically go three to six months between appointments with their endocrinologist.

In that time, they can be at risk of dangerous complications if [glucose levels](#) in their blood rise too high or fall too low. People with type 1 diabetes do not produce their own insulin, so they must take it continuously through the day using an insulin pump or through multiple daily injections. The algorithm developed by OHSU scientists uses data collected from a continuous [glucose](#) monitor and wireless insulin pens to provide guidance on adjustments.

Paired with a smart phone app called DailyDose, the recommendations from the algorithm were shown to be in agreement with physicians 67.9% of the time.

The new study involved monitoring 16 people with type 1 diabetes over the course of four weeks, showing that the model can help reduce hypoglycemia, or low glucose. If left untreated, hypoglycemia can cause coma or death.

The engine was developed in a collaboration between the OHSU Harold Schnitzer Diabetes Health Center and the Artificial Intelligence for Medical Systems Lab led by Peter Jacobs, Ph.D., associate professor of biomedical engineering in the OHSU School of Medicine.

"There are other published algorithms on this, but not a lot of clinical studies," said Jacobs, senior author on the study. "Very few have shown a statistically relevant outcome—and most do not compare algorithm

recommendations with those of a physician. In addition to showing improvement in glucose control, our algorithm generated recommendations that had very high correlation with [physician](#) recommendations with over 99% of the [algorithm](#)'s recommendations delivered across 100 weeks of patient testing considered safe by physicians."

OHSU intends to continue to advance the technology.

"We have plans over the next several years to run several larger trials over eight and then 12 weeks and to compare DailyDose with other insulin treatment strategies, including automated insulin delivery," said co-author Jessica Castle, M.D., associate professor of medicine (endocrinology, diabetes and clinical nutrition) in the OHSU School of Medicine.

More information: Nichole S. Tyler et al, An artificial intelligence decision support system for the management of type 1 diabetes, *Nature Metabolism* (2020). DOI: [10.1038/s42255-020-0212-y](https://doi.org/10.1038/s42255-020-0212-y)

Provided by Oregon Health & Science University

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