

# Taking a vacation from diabetes: Teens take 'artificial pancreas' for a test run

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This weekend a group of teenagers will test an "artificial pancreas" in a real-world environment. Although Yale has been studying these devices for the last decade, this is the first time one will be tested in pediatric patients here outside the hospital.

Five teen participants between the ages of 14 and 17 will gather at the Yale Pediatric Specialty Clinic at 1 Long Wharf Dr. on Saturday May 2 at 11 a.m. They will use an "[artificial pancreas](#)," a system that automatically and continuously monitors the body's sugar levels and delivers the right amount of insulin over a four day period.

The standard treatment for children and teenagers with Type 1 [diabetes](#) is either multiple daily insulin injections or the use of an insulin pump. The insulin pump was first tested in a clinical trial at Yale over 35 years ago, and while it has advanced diabetes treatment tremendously, it must be operated manually to deliver the correct doses of insulin.

Over the last 10 years, Yale School of Medicine doctors have worked with industry partners to develop what many refer to as an "artificial pancreas," an [insulin pump](#) that works with a continuous glucose sensor to automatically adjust insulin delivery in response to the body's demand. Both types of devices are separately approved by the Food and Drug Administration (FDA) and are used by patients. But a closed-loop system, in which the sensor controls the pump on a minute-by-minute basis, would be a major advance.

"The ability of the system to self adjust automatically in the background while patients go about their daily lives would really be transformative in the lives of people with diabetes," said the study's lead investigator, Stuart Weinzimer, M.D., associate professor of pediatrics at Yale School of Medicine, and associate clinical professor of nursing at Yale School of Nursing.

For parents of children with diabetes, such a device would also relieve a huge emotional burden, note the researchers. While high [blood sugar](#) raises the risk of long-term diabetes complications, [low blood sugar](#), known as hypoglycemia, can pose an immediate threat that includes loss of consciousness and coma. Blood sugar levels can fluctuate even at night when patients aren't monitoring themselves, causing some parents to stay up to repeatedly check on their children. Worrying about hypoglycemia also causes some patients to avoid tightly controlling their blood sugar.

In the current study, the five teens will sleep at a New Haven hotel, take part in activities that include hiking, playing laser tag, and climbing a rock wall, and eat their meals together while being monitored by Yale medical staff. "We'll be with them at all times, but it's really going to challenge the system to keep up with kids acting like kids," said Weinzimer. Besides periodically checking [blood sugar levels](#), he and other members of the research team will be able to monitor the teens' sugar levels on their phones and other remote devices.

Two earlier outpatient studies at Yale that tested the device in adults with diabetes showed that they were able to achieve good glucose control. However, such control is difficult for teenagers to attain. Teens tend to be less careful in monitoring their blood sugar, and there are physiological differences that make it more difficult for them to control it. Less than 25% of adolescents with diabetes meet the recommended targets for glucose control, according to Weinzimer.

Weinzimer plans to include a total of 15 teenagers with diabetes in the study, which he says is a large enough group to gauge the device's safety and how well it works. If the study is successful, there will be large-scale studies involving multiple sites before the device is approved by the FDA.

Provided by Yale University

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