Medical News & Perspectives

Start-ups Tout Continuous Glucose Monitoring for People Without Diabetes

Mary Chris Jaklevic, MSJ

To illustrate the wonders of human physiology, Stanford University endocrinologist Sun Kim, MD, MS, occasionally demonstrates continuous glucose monitors (CGMs) on young medical students without diabetes. The sensors show how their bodies release insulin and make other tweaks to keep blood glucose in a narrow range. Changes are so slight, she said in an interview, that students "get bored of the information."

In fact, a 2019 study that aimed to create a benchmark for CGM-measured glucose levels in healthy individuals found they spent a median of 96% of the time between 70 mg/dL and 140 mg/dL. Seldom did readings stray lower than 54 mg/dL, the threshold for serious hypoglycemia, or higher than 180 mg/dL, a level associated with an increased risk of severe diabetes complications if sustained long-term.

"It kind of confirmed, normal is normal is normal, in a good way," study coauthor Anne Peters, MD, director of clinical diabetes programs at the University of Southern California (UCS), said in an interview.

Although experts like Kim and Peters may be blasé about healthy individuals' glucose fluctuations, some start-up companies are betting that many consumers will be eager to track their blood glucose in real time. As glucose monitoring devices developed for people with diabetes become more affordable and convenient, they're now being touted as a wellness tool for those without the condition. Companies such as January AI, Levels, NutriSense, and Signos say the biofeedback provides motivation and enables personalized strategies to lose weight, optimize exercise, and adopt healthier habits.

Clinicians involved in these efforts told *JAMA* that they believe the devices can combat growing epidemics of obesity, heart disease, diabetes, and other health conditions related to poor diet. "It seems like such low-hanging fruit to use something like a continuous glucose monitor to guide all of us," said Lisa Oldson, MD, an Illinois-based obesity medicine specialist in private practice and a clinical advisor to NutriSense, a health coaching company that uses CGM data.



iStock.com/vgajic

But aside from anecdotal success stories, there's little evidence that people with normal glucose responses benefit from tracking their blood glucose. Some experts say CGMs may be a waste of time and money that diverts consumers' attention from useful interventions. "Until proven, it's just like a supplement—we don't know whether it works or not," endocrinologist Robert Eckel, MD, past president of science and medicine for the American Diabetes Association (ADA), said in an interview.

The Unproven Allure

The start-ups provide software that logs blood glucose readings and offers insights into how food, exercise, stress, and sleep affect users' glycemic responses. Each takes a slightly different approach. NutriSense, for example, enables subscribers to exchange messages with a dietitian and January AI claims its software can predict users' responses to foods.

All use Abbott FreeStyle Libre sensors, which attach to a person's upper arm and transmit data when a user scans it with a smartphone. The sensors last for 2 weeks. Because they require a prescription, companies refer potential customers to independent telehealth physicians licensed to practice in each state, who are compensated with a flat fee.

The information doesn't come cheap. Entry-level packages that include the sensors range from $175 for 2 weeks with NutriSense to $399 for 4 weeks with Levels, and none is covered by insurance. In some cases, the monthly price drops with a longer-term commitment.

Companies say real-time feedback can steer users away from high-sugar, low-satiety foods and encourage physical activity that moderates blood glucose. Studies show that individuals eat less and feel more satisfied after consuming high-protein foods such as eggs that release glucose more slowly than high-carbohydrate choices such as cereal that are associated with blood glucose spikes followed by dips.

While the data may seem obvious, some people might benefit from the nudge. "Just like a Fitbit encourages people to walk more, the CGM encourages people to stick to what they know is good versus not so good," NutriSense cofounder and nutrition director Kara Collier, RDN, said in an interview.

The companies also point to research showing that individuals vary in their glycemic responses to food. On its website, Signos asserts that many diets are "ineffective or unsustainable" because they don't account for each person's unique responses to specific foods.

Finding a nutritional pattern that works is important for preventing the downstream effects of obesity and metabolic disease such as heart attacks, strokes, and chronic pain, Signos cofounder and Stanford Health Care emergency physician William Dixon, MD, noted in an interview. "If you look at the rising rates of obesity and metabolic syndrome throughout the country and the world, it's clear that people are having trouble," he said.

© 2021 American Medical Association. All rights reserved.

Downloaded from jamanetwork.com by The University Of North Carolina Chapel Hill user on 10/06/2026

Dixon credited a CGM with helping him lose 20 lb (9 kg) by identifying foods such as teriyaki stir-fry and fruit-flavored yogurt that cause his blood glucose to spike. The app also showed him that he could blunt those increases with 20-minute sessions of high-intensity interval training, he added.

Some companies claim the readings can improve athletic performance. Abbott says its Libre Sense Glucose Sport Biosensor, introduced as an over-the-counter device in Europe last year, enables athletes to appropriately time fueling during training and competition. In an email, a spokesperson for sports technology company Supersapiens, which sells the sensor, said that it's studying active individuals' glycemic patterns but acknowledged that "the literature is still scarce" on CGM use among athletes.

Ahead of the Evidence

This wasn't the way CGMs were initially envisioned. First approved by the US Food and Drug Administration in 1999, the devices have enabled people with diabetes to better manage their disease by alerting them to dangerous glycemic highs and lows without the pain and inconvenience of finger sticks. In 2017 Medicare began covering the devices for people with type 1 diabetes and those with type 2 diabetes who rely on them to dose insulin.

There's less agreement about CGMs for people with type 2 diabetes who don't need insulin but might use continuous feedback to modify their behaviors in ways that improve glucose levels. To reduce the risk of complications, the ADA has recommended that all individuals with diabetes spend at least 70% of their time in a target glucose range of 70 mg/dL to 180 mg/dL.

For people without diabetes, it remains to be seen whether tracking glucose can foster better habits. Guidance hasn't been established for how healthy individuals should respond to particular readings, some experts noted. Kim worries that companies marketing CGMs for wellness may "promise too much, like they can specifically tailor your whole diet and exercise routine based on the glucose readings." For many dieters, eliminating unhealthful carbs such as sweets and processed grains is helpful because those foods are a large portion of what they normally eat, Kim noted, but that strategy doesn't guarantee weight loss.

Anecdotally, Kim has found that glucose readings can do a good job of educating patients with prediabetes about the impact of food choices; some succeed in adopting healthier habits. But with any tracking device, "the person needs to be receptive and want that information and then be motivated to do something with it," she said. Factors such as pervasive marketing of tasty, calorie-dense foods may deter long-term success. "That's the reality today," she said. "These foods are so enticing and you want them for so many reasons, even when you know it might have harm."

University of North Carolina researcher Deborah Tate, PhD, who is studying whether CGMs enhance weight-loss strategies for people with and without diabetes, said the devices might encourage individuals to eat better or reduce their dietary recording burden, but that for now those are unproven hypotheses. "We might be a little bit ahead of our time in terms of saying we've got this figured out," she said.

Although the devices themselves pose little safety risk, there are potential pitfalls. For weight-loss counselors, time spent poring over data points might be better devoted to, say, problem-solving about why someone can't get to a grocery store to buy nutritious food, Tate noted. Interpreting CGM data also requires literacy and numeracy skills. "What supports do we need to help people, and how can we make sure we're not furthering disparities by thinking of these technologies as the answer?" she said.

What's more, minute-by-minute readings might trigger obsessive behaviors. Online calorie tracking applications and activity monitors, for example, have been associated with eating disorder symptoms among college students. To discourage this, NutriSense queries would-be customers about eating disorders and advises those who indicate they have one to contact their primary care physician before proceeding, Chief Operating Officer Dan Zavorotny said via email.

Another caveat is that the devices—which measure glucose in interstitial fluid, not plasma—aren't 100% accurate. In a 2020 study of 16 adults without diabetes, researchers at the National Institute of Diabetes and Digestive and Kidney Diseases found that 2 leading CGM devices, the Abbott FreeStyle Libre Pro and the Dexcom G4 Platinum, differently ranked glycemic responses to the same meals when worn simultaneously. The authors concluded that using CGM to personalize meal recommendations and minimize blood glucose spikes "may be premature."

To overcome this, physicians advise users with diabetes to focus on trends and verify with a finger-stick test if a reading doesn't seem right. "You have to keep in mind that these technologies are still relatively new, and they have flaws," Kim said.

Haves and Have-nots

Experts say CGMs might hold promise in preventing type 2 diabetes among the estimated 88 million US adults with prediabetes—particularly those whose hemoglobin A_{1C} (HbA_{1c}) readings indicate high risk. Researchers have begun to explore whether CGMs make a difference for that group. For example, investigators at the Chinese University of Hong Kong are conducting a randomized trial to see if adding CGM use to an 8-week lifestyle modification program improves readings on a 1-hour glucose tolerance test for individuals with prediabetes.

Although the COVID-19 pandemic interrupted her work, Kim has been piloting the devices for people with prediabetes who are overweight or obese to gauge whether directing patients to foods that moderate blood glucose correlates with weight loss. With CGM use growing, she said, "We need to know who it helps."

Meanwhile, some experts say people with prediabetes should proceed with caution. Eckel, an American Heart Association past president and a University of Colorado emeritus professor of medicine, said he wouldn't discourage patients who want to improve their glucose metabolism from trying a CGM. He would, however, offer a dose of reality: "I would say, 'We don't have the kind of trial yet to show whether or not this is effective, but if you're showing me that this application can modify your lifestyle to reduce your risk for type 2 diabetes, that would be great.'"

Yet efforts to popularize CGMs have rankled some people with diabetes. Marketing the devices to people who are curious to "hack" their blood glucose, they say, trivializes the dilemma of patients for whom monitors and other critical diabetes supplies remain expensive or out of reach.

In a post on the online community Diabetes Daily, advocate Christine Fallabel, who has type 1 diabetes, noted that as of 2019, 16 state Medicaid plans did not cover CGMs. Although most private insurers and

© 2021 American Medical Association. All rights reserved.

Downloaded from jamanetwork.com by The University Of North Carolina Chapel Hill user on 10/06/2026

Medicare do, she wrote, "affording one without health insurance is nearly impossible." The most popular model, the Dexcom G6, which can connect to insulin pumps, runs $4200 a year, according to data from the website GoodRx.

An analysis of registry data by the nonprofit T1D Exchange showed that 38% of people with type 1 diabetes used a CGM in 2018, with much lower adoption among Black and low-income individuals. Experts say usage has increased during the COVID-19 pandemic, in part because the Centers for Medicare & Medicaid Services nixed a requirement for patients to show a need for frequent blood glucose testing. Temporary rule changes also allow patients to fill prescriptions without meeting a clinician face-to-face.

Peters noted that her low-income patients with diabetes experience far more avoidable amputations, kidney disease, and blindness. Inequities between the "haves and have-nots for the management of diabetes in our country, in particular with regard to the use of technology, are huge," she said.

With tech giants Apple and Samsung reportedly attempting to add glucose sensors to smartwatches and Abbott launching the sensor for athletes, some contend that wider uptake will lead to better, cheaper products. "The people who are angry about this are in some ways shooting themselves in their own feet," Aaron Kowalski, PhD, president and chief executive officer of the type 1 diabetes advocacy organization JDRF International, said in an interview. With a market of 1.6 million people in the US with type 1 diabetes, "you're not going to see a lot of innovation in the next few years," he said. "If you blow it up, there's going to be much more interest" on the part of manufacturers.

Meanwhile, some physicians who treat diabetes anticipate other upsides. More primary care physicians may learn how to use the data, leading to better care for those with diabetes who have a device. And there may be less stigma around wearing a sensor, particularly for younger, body-conscious patients. While healthy individuals might relish testing out a trendy health gadget, Kim said, it can feel different "when you actually have the disease that requires it." ■

Note: Source references are available through embedded hyperlinks in the article text online.

© 2021 American Medical Association. All rights reserved.

Downloaded from jamanetwork.com by The University Of North Carolina Chapel Hill user on 10/06/2026