DIABETES MINE Influencer

Thank You, Smartwatches: Monitoring Diabetes from Your Wrist

By Mike Hoskins — Fact checked by Jennifer Chesak, MSJ — Updated on April 19, 2022

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Viewing blood sugars with just a quick glance at your wrist is no longer a futuristic dream for people with diabetes, but is now a reality for many of us.

In fact, wearing a continuous glucose monitor (CGM) sensor that can beam near-real-time data to a smartwatch is becoming a cornerstone of daily care for many people with diabetes.

However, it's still a bit haphazard as to which CGM is compatible with which version of iPhone or Android

phones, as market leader Dexcom and others scramble to keep up with evolving consumer technology. And those who rely on do-it-yourself (DIY) diabetes tools are always finding new ways to tap into existing technology for personalized data-viewing.

Here's a look at how currently available CGM systems from Dexcom, Medtronic, Abbott, and Eversense connect to smartwatches, and some of what we may expect in future diabetes technology worn on the wrist.

Attempts at ‘noninvasive’ glucose monitoring

We’ve come a long way since the very first diabetes wristwatch concept introduced in 2001: the GlucoWatch G2 Biographer, an early attempt at noninvasive glucose monitoring (meaning it took readings without penetrating the skin). Despite gaining regulatory approval at the time, that product unfortunately failed and was discontinued in 2007.

There are many ongoing attempts to create a viable wrist-based noninvasive glucose monitor, but none have taken a foothold to date. (See notes on the K’Watch Glucose product below.)

Today, we are grateful to simply be able to view glucose readings on a mainstream smartwatch that’s not designed specifically for diabetes. Some of the most common models compatible with CGM devices include the Apple Watch, Android Wear, Fitbit (formerly Pebble), and Samsung.

It is critical to understand that it’s not the smartwatch actually monitoring your glucose levels. Rather, for most of the technology currently available, the watch simply acts as a conduit receiving the data from your CGM sensor/transmitter via a smartphone app.

Dexcom

We can credit San Diego, California-based CGM market leader Dexcom with pioneering the ability to view glucose data on a smartwatch. The company first enabled limited Apple Watch connectivity in April 2015, and later expanded that with its G5 model in March 2016, and the more advanced G6 model launched in 2018.

Image via Dexcom

Now, the Dexcom G6 mobile app is compatible with both Apple and Android watches with various watch

faces. It displays your current glucose number and arrow trend, as well as graphs for 1-, 3-, 6-, and 24-hour periods.

Anytime you wake up the Apple or Android watch, it syncs with the current CGM data from the app running on your iPhone or Android phone.

We're still waiting for Dexcom to provide direct-to-watch connectivity, which the company has been promising for years. Dexcom has said during investor updates that direct smartwatch connectivity will be coming with their next-generation G7 model, expected in the United States by the end of 2022.

Until then, users still need to use an iPhone or Android phone as a go-between to receive data and access alerts on the smartwatch.

One fun aspect of the Apple Watch is that you can make the Dexcom change the watch face color to reflect your glucose status — red, green, or yellow — to call attention to your current reading.

You can see this full list of compatible devices for the Dexcom CGM. Remember, just because a phone or watch isn't initially listed now doesn't mean Dexcom isn't working to add it down the road.

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Garmin watches and diabetes data

One of the smartwatches compatible with the Dexcom is the Garmin watch. This development in 2021 made headlines, as it marked the first time that “real-time” CGM data could be streamed directly from Dexcom to a particular smartwatch.

Previously, this hadn’t been possible without a DIY workaround, but the Food and Drug Administration (FDA) in July 2021 gave the green light for this type of partnership to occur. It opened the door for other companies to use Dexcom’s real-time software in creating apps or other wearable options for data display as well.

This was the first time another company outside of Dexcom was able to use the CGM-maker's real-time software to develop and integrate its glucose data into their own apps and devices.

They even made a polished 74-second commercial highlighting the development, featuring some high profile celeb athletes who live with diabetes themselves.

An at-a-glance 'Connect IQ' widget can be displayed on a compatible Garmin smartwatch, so you can view real-time glucose levels as well as a trend arrow and a 3-hour history CGM line.

There is also a field that allows users to see glucose data on a compatible Garmin smartwatch or bike computer while working it. It displays glucose levels as well as trend direction along with other performance metrics you may be tracking during physical activities.

One benefit of this — aside from viewing data on the spot during exercise — is being able to later go back and review your CGM data along with activity data, in order to see how your glucose levels were impacted by a particular exercise event like a run or bike ride. That's hugely beneficial in understanding the effect of exercise on our blood sugars.

Even though you can get real-time Dexcom G6 data on these Garmin devices and watch the trends, Garmin intentionally does not include any of its own alerts or alarms for when glucose levels go too low or high.

However, the Garmin technology does still communicate with other mobile apps and data platforms while the Connect IQ widget is being used. That means notifications sent to the Garmin device from another app, such as the Dexcom G6 mobile app's high or low glucose alerts, will be active.

Stephanie Schultz, a senior media relations specialist for fitness at Garmin, confirmed that while using the newest Connect IQ app, she was still able to get Dexcom alerts as notifications on her Garmin watch.

This also does not include any functionality for Dexcom Followers — those who are not wearing the Dexcom G6 themselves, but are remotely monitoring a child or other person's CGM data through the Dexcom mobile app. While Garmin and Dexcom are both aware that is of interest for many in the D-Community, it is not yet possible.

"The addition of Garmin wearables and cycling computers to the Dexcom CGM ecosystem is an exciting advancement for Dexcom users, who are now able to easily view and monitor their glucose levels from their favorite Garmin device," Dexcom's chief technology officer Jake Leach said. "Garmin is our first partner to connect to Dexcom G6 through our new real-time API — showcasing the value of integrated CGM and further solidifying Dexcom G6 as the most powerful and connected CGM in the world."

Medtronic diabetes

Medtronic Diabetes is the market leader in insulin pumps and the only company that also makes a CGM, the Guardian Connect. For the most part, they are pushing customers to purchase their combined system, the partially automated Medtronic 770G.

This company's tech doesn't currently have a real-time data display on Apple or Android smartwatches. But those using the Guardian Connect CGM as a stand-alone product can view push notifications and status alerts on any compatible smartwatch, and the rest of the data on the Medtronic mobile app.

Medtronic Diabetes had been collaborating with Samsung to develop a watch device for several years, but the company tells DiabetesMine that it is no longer in the works.

Eversense implantable CGM

The implantable Eversense CGM from Senseonics and Ascensia Diabetes Care is unique in that it does not have its own receiver, but is completely dependent on a smartphone app to function. That means to activate the system, see glucose readings, and receive alerts for high and low blood sugars, you need to use a smartphone.

Eversense is compatible with both Android and iPhones, as well as the Apple Watch, according to the company website. We're told that Android smartwatch connectivity is in development, but there is no timeline on when that might be available.

See the full compatibility list here for more details on which devices work with the Eversense CGM.

FreeStyle Libre

This system from Abbott Diabetes Care is known as a “Flash Glucose Monitor” that requires users to manually wave a scanner over the small circular sensor worn on the arm to get a glucose reading. That is true for the FreeStyle Libre 2 model, but the new version 3 recently launched outside the United States is doing away with the need for manual scanning, making it more competitive with CGMs from Dexcom, Medtronic, and even the implantable Eversense.

In Europe, several DIY tools have emerged that make smartwatch connectivity possible for the FreeStyle Libre, but it’s not yet available through the commercial models that need to be scanned in order to display glucose results.

That may be something Abbott offers when the Libre 3 makes it to the United States, but so far, there’s no official word on that.

DIY tools + Fitbit

Around 2013, tech-savvy developers and coders began hacking into their diabetes devices and building mobile apps to beam data onto smartphones and watches. This became known as the #WeAreNotWaiting DIY diabetes movement.

The mobile apps they created for data-sharing, including Nightscout and xDrip, actually paved the way for smartwatches and remote connectivity for CGMs.

It began with the popular Pebble Watch, which was acquired by Fitbit. There is now a handful of new Fitbit smartwatches that weave in CGM connectivity, including the Fitbit Versa and Ionic brands.

K’Watch Glucose device

As noted, numerous developers are chasing the dream of creating a successful noninvasive glucose-tracking watch.

Notable among those is the K'Watch Glucose tracking watch launched in 2018, a year after first grabbing headlines at the big Consumer Electronics Show (CES) in Las Vegas, Nevada. This doesn't continuously monitor glucose, but takes a measurement every time you touch a button on the watch to prompt it to do so.

K'Watch is the creation of the 2016-formed French startup company PKVitality (pronounced PEEKA-Vitality), which brands it as "the first-ever glucose monitoring sensor embedded directly into a wearable device that measures blood glucose levels through your skin." [*Guess they never heard of the now-defunct GlucoWatch?*]

The company states that this watch "uses microneedles to 'taste' fluid just below the skin's surface and analyze it for glucose or lactic acid."

Specifically, underneath the watch face, there's a special proprietary biosensor known as the "K'apsul" made up of tiny microneedles that work to "painlessly penetrate the top layer of skin and analyze interstitial fluid" — which is the same fluid measured by other CGMs.

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