

# CGM: Ready For A Second Look?

By Gary Scheiner MS, CDE

When it comes to technology, three years is an awfully long time. Computers sold three years ago barely have enough memory to run today's software. Few cell phones had internet access, and televisions could pick up local broadcasts without the aid of a cable.

In the field of diabetes, continuous glucose monitoring (CGM) has seen a similar evolution. The "Glucowatch" debacle notwithstanding, most real-time CGM systems were introduced just three years ago. For the most part, these first-generation systems had their share of quirks and glitches, including accuracy problems, complex programming, and annoying alarms. Combined with the lack of insurance coverage, it was enough to deter many people from giving this innovative technology a try.

But as the saying goes, time has a way of healing.

Each manufacturer of CGM equipment (Medtronic, Dexcom and Abbott) has installed a department dedicated to working with clients to help secure insurance coverage. And thanks to their persistence and the appearance of original research in peer-reviewed scientific journals,

insurance coverage for CGM is spreading across the country. In the past year, there has been a 30-fold increase in CGM coverage, with more than 200 million Americans now having some form of coverage for CGM in their commercial health plans.

The engineers at each of the CGM companies have been hard at work making improvements to their respective systems. What we have today is far from perfect, but it is definitely more serviceable than what we had a few years ago. To me, the true test of technology is whether what you get out of it exceeds the work you put into it. Today's systems provide more valuable information and are much less of a pain-in-the-you-know-what than they used to be. Let's look at some of the details.

## DEXCOM

Of the three companies, Dexcom has made the most improvements, but they probably also had the most room for improvement. Their latest model, the Seven Plus, sports a number of features that were not available in earlier models. A simple, easy-to-access menu on the receiver allows for quick manual input

of calibration readings (no need to plug in to a meter). Alarms can be customized so that loud beeps can be avoided, and a "snooze" feature keeps alarms from recurring too often. New on-screen trend arrows indicate the direction and rate of blood sugar change, and optional alarms can occur with rapid changes in blood sugar. Trend graphs display the most recent 1, 3, 6, 12 and 24 hours of data, and the download software provides a unique "progress report" to show how overall control is changing over time.

The original Dexcom was often criticized because of the number of substances (including several common medications) that could interfere with the sensor's accuracy. Changes have been made to eliminate almost all of these issues; acetaminophen remains one of the few substances that can influence Dexcom's accuracy.

Perhaps the most important changes in the Dexcom system involve the transmitter and calibration algorithm. The improved transmitter function means far fewer data gaps and improved signal clarity. Unlike earlier versions of the Dexcom, the system now gears its current readings and trend graphs immediately towards

calibration entries. This enhances overall data accuracy and reliability. In fact, Dexcom no longer requires calibrations to be performed in a “steady state”. Calibration readings can be entered whether the current blood sugar is rising, falling or steady... a definite convenience for users of the system.

Oh, before I forget, compared to the original Dexcom, the Seven Plus asks for sensor changes (or system reset) every seven days instead of 3, and the sensor/transmitter is now fully waterproof.

## NAVIGATOR

Since Navigator was the last device to enter the marketplace, there hasn't been much time for “evolution”. However, two important changes / improvements have been made.

First, despite the fact that Navigator already offers excellent on-screen data analysis in both graphic and statistical form, downloading software was made available last year. A special “extension” program can be added to Abbott's PC-based Copilot software, allowing it to incorporate data from the Navigator system via Bluetooth technology.

The second improvement involves the sensor itself. When Navigator sensors were first introduced, concern was

raised about the possibility of silicon residue being left under the skin after the sensor was removed. Although this was an extremely rare occurrence, Abbott changed the sensor's backing material from silicon to ordinary carbon in order to eliminate the risk entirely.

## MEDTRONIC

Early adopters of the Medtronic CGM may recall recurring issues with sensor availability. The good news is that the company has improved its production techniques to help ensure ample long-term availability.

Insurance coverage for CGM systems and sensors has been one of the major roadblocks for those looking to utilize this innovative technology. No company has been more aggressive or dedicated more resources in this area than Medtronic. Led by the emergence of research data such as the STAR 1 Study (published in Diabetes Technology and Therapeutics) supporting CGM's safety and benefits, Medtronic's work with payors has paved the way towards vastly improved insurance coverage.

Through a better understanding of the sensor's functionality, Medtronic has implemented a number of changes to their training processes. These changes, including altering the angle of insertion and allowing

for a “wetting” period after insertion, have resulted in improved sensor performance.

Medtronic has also placed significant emphasis on data analysis software. New iterations of their original web-based Carelink Personal software have already been launched, along with a CareLink USB device for easing and speeding the data upload procedure without going through a blood glucose meter. The latest version of Carelink supports more than thirty different blood glucose meters.

Sure, the one constant in life is change. A few years from now, we'll probably look back at today's CGM systems and think, “How primitive was that?” But at some point, the good stuff clearly outweighs the bad stuff, and it makes sense to make the move. My practice continues to offer CGM “trials” for those looking to try out the latest systems and receive some insight regarding the results. This is available in-office or remotely via mail and phone. For more information, call (877) 735-3648, visit [www.integrateddiabetes.com](http://www.integrateddiabetes.com), or write to me at [gary@integrateddiabetes.com](mailto:gary@integrateddiabetes.com).

Our web site also contains a detailed comparison of the various CGM systems for those who are considering which one to utilize:

<http://www.integrateddiabetes.com/CGMCompSep08.doc>

*Editor's note: Gary Scheiner MS, CDE is Owner and Clinical Director of Integrated Diabetes Services, a private consulting practice based near Philadelphia offering intensive diabetes management consultations via phone and the internet. He is the author of several books, including Think Like A Pancreas: A Practical Guide to Managing Diabetes With Insulin.*