Medtronic insulin pumps are one kind of 'smart' pump considered the closest tool available to how our bodies deliver insulin. The Medtronic REAL-Time Revel System can integrate a pump, a continuous glucose monitor and therapy management software.

Insulin pumps, insulin pens and blood sugar monitors. Those are some of the latest devices that can make it easier for the millions of people with diabetes to manage the disease.

But even as new technologies take hold — and even more are on the horizon — it means patients need to be smart, educated consumers to choose the device that works for them.

“There has been an explosion of available medications, technologies and glucose-health tracking tools available for people living with diabetes. It is therefore important that consumers be mindful and research what is available and ensure that all major diabetes management decisions are discussed with the individual’s health care team,” said Kellie Rodriguez, director of education services at the Diabetes Research Institute, University of Miami.

Another resource, offered by the American Diabetes Association: an annual consumers guide.

No matter the technology, consulting with a certified diabetes educator and training is crucial, said Lois Exelbert, a board member for the local American Diabetes Association and director of the diabetes center at Baptist Hospital.

“Somebody who goes on a pump without the proper education risks dangerous consequences,” she said. “They can have a kink in the pump and not know it, or they can miscalculate a dose if they are not properly informed.”

With that caveat, here are some options to review with your doctor and diabetes educator.

INSULIN PUMPS
New ‘smart’ pumps form the cornerstone of technological advancement, Rodriguez said. They provide the closest tool to replicate how our bodies deliver insulin. There are currently four on the market:

- Omnipod by Insulet;
- One Touch Ping by Animas / Johnson & Johnson;
- Revel by Medtronic; and
- Spirit by Roche.

All have similar options to deliver insulin: calculators, the ability to vary the amount of basal, or baseline, insulin, and delayed injections. Some have additional features. For example, the Omnipod offers a tubeless pump; the One Touch Ping has a remote insulin calculation and delivery and personalized food diary; and the Revel combines the pump with continuous glucose monitor capabilities.

In the future, there could be pumps that automatically shut off if someone has hypoglycemia, Rodriguez said. The ultimate goal: incorporate a patch pump to detect glucose and respond to changes — independent of the patient.

For Astrid Matthysse, who uses the One Touch Ping, the elimination of injections wasn’t the most important change. “Just the freedom I have with the pump — an easier lifestyle,” she said. Matthysse, 51 and the mom of two college kids, keeps a busy schedule. She works as a clinical manager for Animas and is earning a master’s degree in international business.

“When I was on injections, I had to stop to eat, otherwise my blood sugar would drop too low. Now with the pump, I can eat whenever I want and my blood sugar will not be affected,” she said.

PATCH PUMPS

These offer another method to deliver insulin. They have an insulin reservoir, delivery system and cannula — an insertion device — all built into a small, wearable device that is disposable or semi disposable.

“Patch pumps simplify traditional insulin pump therapy — essentially they are tube-free pumps,” Rodriguez said. Insulet’s Omnipod is available in the United States. A new patch is on the horizon for 2012: the V-Go, a fully disposable device to deliver basal and bolus insulin for adults.

Rodriguez said some of the benefits are that they are easier to use because there are no tubes; training is simplified; and the up-front costs are lower.

CONTINUOUS MONITORS

Continuous glucose monitors (CGMs) can give nearly 300 glucose readings in 24 hours; provide trending information, which is especially valuable overnight and after a meal.
Exelbert said continuous monitors are a key instrument for people whose blood sugar fluctuates a lot. Even if not used permanently, Exelbert said the continuous monitor can be used for a week as a diagnostic tool.

The benefit: more blood sugar readings and information if the level is headed down or up, she said. If someone tests their glucose every two hours, “what’s still missing in between is what happens to blood sugar and you don’t know if blood sugar is on the way up or down,” Exelbert said. “But by wearing a continuous glucose monitor you’re getting readings every five minutes and it’s telling you if it’s trending up or down.”

There are four continuous glucose monitor systems available on the market: DexCom; Guardian by Medtronic; I-Pro, and the Paradigm/Revel Insulin Pump sensor combination by Medtronic.

Della Matheson, a registered nurse and research coordinator at the Diabetes Research Institute, University of Miami, said she used to stick her finger eight to 10 times a day. With her continuous sensor — she uses DexCom — she can get a reading every five minutes.

“It gives me more information so I can anticipate where I’m headed and what I’m going to do behaviorally,” she said. “It [sounds an] alarm if you go below or above your target – it’s a hypoglycemia alert system.”

METERS AND PENS

People with diabetes can find both disposable and non-disposable insulin pens. The needles have become smaller and companies have made their own advances. For example, Lilly’s pen, called the Memoire, provides a reminder of when the last bolus of insulin was delivered and how much.

Matheson said the pens are more convenient. “You can carry them in your purse or your pocket, it makes it easier to take your insulin on the go,” she said.