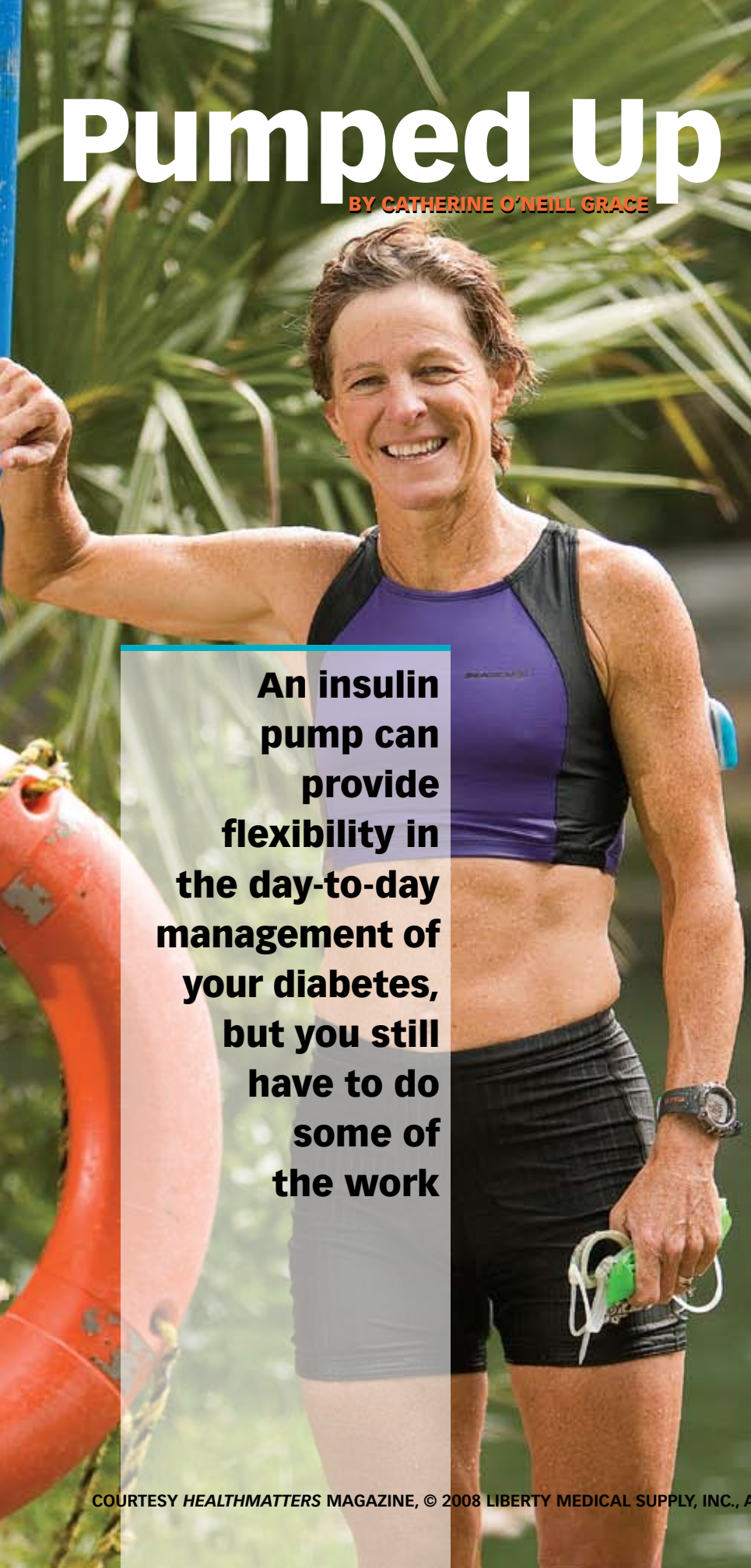


# Pumped Up

BY CATHERINE O'NEILL GRACE

A woman with brown hair, wearing a purple and black athletic top and black shorts, is smiling. She has an insulin pump attached to her left arm. She is holding a green and white device in her right hand. The background is a blurred outdoor setting with green foliage and a red life preserver on the left.

**An insulin pump can provide flexibility in the day-to-day management of your diabetes, but you still have to do some of the work**

**W**e've all gotten used to carrying around small electronic devices that make our lives easier, from cell phones to pagers to PDAs like PalmPilots. For some people with diabetes, there's another — an insulin pump, an unobtrusive, pager-sized device that can deliver insulin at a continuous rate and allows you to give extra insulin as the need arises.

According to the Joslin Diabetes Center, part of Harvard Medical School in Boston, insulin pump therapy offers the closest match to the way a body would normally deliver insulin. As Gary Powell, 63, of Danville, Ky., has discovered, using a pump requires more work than injecting insulin, but offers better control. Although "pumping" means checking blood glucose more often, for triathlete Kathy Gagnier, using the device allows her the freedom she needs as she trains for her demanding sport.

## **Injection alternative**

An insulin pump substitutes for injections and delivers insulin continuously, day and night. Several styles of pumps are available, and most deliver insulin through a thin tube inserted under the skin at the same depth where insulin would be injected.

Using the pump effectively means checking glucose levels at least four times a day. Users also must count the carbohydrates in their food and adjust

*Kathy Gagnier's insulin pump stays securely attached to her arm, even when she swims, bikes and runs.*

the delivery rate of insulin based on a combination of blood glucose levels, what food they're planning to consume and what exercise they're planning to do.

It takes training and attention to use a pump. The user programs the device, telling it how much insulin to inject. Insulin is delivered by the pump in two ways. The first, the basal rate, is a continuous trickle of insulin that keeps blood glucose stable between meals and during sleep. Second, a bolus dose is delivered when the body's need for insulin may be higher, such as during meals.

Pumps have been around since 1979, and they have become smaller and easier to manage. Several brands of insulin pumps are available, allowing people with diabetes to choose which one best meets their needs. Today, state-of-the-art pumps can calculate how much insulin needs to be delivered in a particular situation, but the user still has to input the data — and must be educated to learn how to do it right.

### Education is key

Diane Ballard, RN, BSN, CDE, is a certified pump trainer who

works with patients (including Gary Powell) at Kentucky Diabetes Endocrinology Associates in Lexington.

"Pump training is about a three- or four-visit process," Ballard says. "At my initial interview I ask a lot of questions and decide whether a patient is a good candidate. They have to want it. If they're not on board with it, they're not a candidate. You can't be uncomfortable with technology! We have an all-electronic charting system in our office, so we do a lot of communicating online. We also download patients' pumps at

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## In the Running



**KATHY GAGNIER, 51**, achieved a goal this spring that few people even dream about — and she did it with diabetes.

Gagnier, a stay-at-home mom of a daughter in college and son in high school, lives in Winter Park, Fla. This spring, she qualified for the Ford Ironman World Championship in Kona, Hawaii. In October, she flew to Kona to take on the challenge of

the Ironman triathlon: a 2.4-mile ocean swim, a 112-mile bike ride across the lava desert and a marathon (26.2 miles) run along the coast of the Big Island. She placed an impressive 13th out of 37 women in her age group, and her trusty insulin pump was with her every stroke, pedal and step of the way.

"I got the pump a year ago August," she says. "I have only been diabetic since age 47. It came out of nowhere. Using the pump has made things a whole lot easier."

Always athletic, Gagnier got pumped to do an Ironman after watching her husband participate in one at Lake Placid, N.Y.

"I said, 'The next time you do one, I'm doing one.' So we signed up for the race in Arizona."

Gagnier downplays her victory there. "I qualified and picked the right race. There were only about 24 women in my age group, and among that group eight didn't finish. When I realized how few women there were,

I thought, 'I don't care who they are — I can beat 16 people.' I did the race in 12 hours, 15 minutes. Most qualifiers come in under 12 hours, so I got lucky."

Her diabetes was diagnosed after she felt ill following a Thanksgiving Day fun run.

"I was fine for a mile, and then for the next two miles I was suffering," Gagnier recalls. "But I ran the whole way, and when I finished I wondered what was wrong with me. I just felt weird. The next day I told my husband, and he said, 'Well, you have kind of lost a few pounds.' So I went to the doctor, had a blood test, and found out I had diabetes. I didn't know anything about it."

Gagnier used insulin by injection for a while, and then decided to try the pump, which makes her swimming, biking and running easier to do.

She has also changed her eating habits. "I use *Cooking Light* magazine," Gagnier says. "I go through each issue and write down the page numbers of things I want to make. I find it helps control my diabetes if I stay with low-fat recipes and only have to count carbs."

How does Gagnier find the discipline to train for triathlons?

"You want to win, man!" she laughs. "You want to get that competitive spirit. When I was growing up I didn't know any competitive girls. Now I can't believe how many competitive women there are. If you drive away from my house, you will see 10 runners before you get to the Interstate."

And at least one of them is wearing an insulin pump.

# Back in the Swing



**GARY POWELL** can often be found on the golf course near his home in Danville, Ky. When he's out there, he's not only lining up putts and hoping his drives fly high; he's also receiving a continuous dose of insulin to manage his diabetes.

How? Powell uses an insulin pump. He's a new pumper, although he has had type 1 diabetes since age 7.

"I was placed on insulin probably a year after I was diagnosed," says Powell, a retired minister who now works part time as a drug rehabilitation counselor. "We tried to deal with it with diet, but that didn't work because I am a type 1. We just didn't know as much about diabetes back then as we do now."

This year, Powell went to a new doctor, who suggest-

ed he try a pump. "I chose the pump that seemed like it would work best for me and my routines. I'm in my fourth month," he says.

Adjusting to his new routine has taken time, Powell says, but "it's a night and day difference for me, mainly in control. I was having difficulty with the long-acting insulin that I used at night. It gave me too many low blood sugar readings and episodes of hypoglycemia. Those have evened out now. I still have some other health issues that I have to work around, but insulin delivery is not one of them. Blood sugar is not one of them. For the first time, I can play golf and keep a level blood sugar."

Powell admits that using the pump requires a certain degree of patience, but the attention to detail required is worth it.

"I have a wife and two daughters and 16 grandchildren, so I have a big family to take care of!" he says.

every visit so we can look at their blood-glucose grids."

Ballard says that there are also challenges to be understood when using a pump, and that these need to be explained in advance and carefully managed.

"There are definite cons — if your [pump] gets clogged you can go into DKA [diabetic ketoacidosis, an emergency situation that occurs when blood sugar levels spike]. A lot of people think the pump will do everything for them. That is the biggest myth, along with the idea that it will be implanted under the skin. It won't," she explains.

Ballard tells patients, "This it is not going to run itself. You have to have enough knowledge to do it, and you have to be willing to count carbs and do your blood sugars."

But once patients get the routine down, the flexibility is a huge advantage. "They can eat pizza and pasta again, because

we can match their insulin to their food needs," she says.

According to Dr. Howard A. Wolpert, director of the Insulin Pump Program at the Joslin Diabetes Center, there are about 200,000 pump users in the United States. He says that pumps are mainly used by people with type 1 diabetes — that is, people whose bodies do not produce insulin on their own. (The Juvenile Diabetes Research Foundation reports that about 10 percent of the 24 million Americans with diabetes have type 1.)

## Freedom of flexibility

Type 1 diabetes is often diagnosed in childhood. Wolpert says that, with proper training and oversight, pumps can be used by people with diabetes from childhood on. Mary Rotman, 23, of Santa Rosa, Calif., was diagnosed at age 2½.

"I have been on the pump for 11 years now," Rotman

says. "When I got it I was in junior high, and it made a huge difference in my life. I was able to play sports, participate in school activities, attend sleepovers with girlfriends, and in general have much more flexibility when it came to eating, classes, sports and all the other things life throws your way. It also smoothed out the road of puberty and hormones as my blood sugars fluctuated and changed by the day.

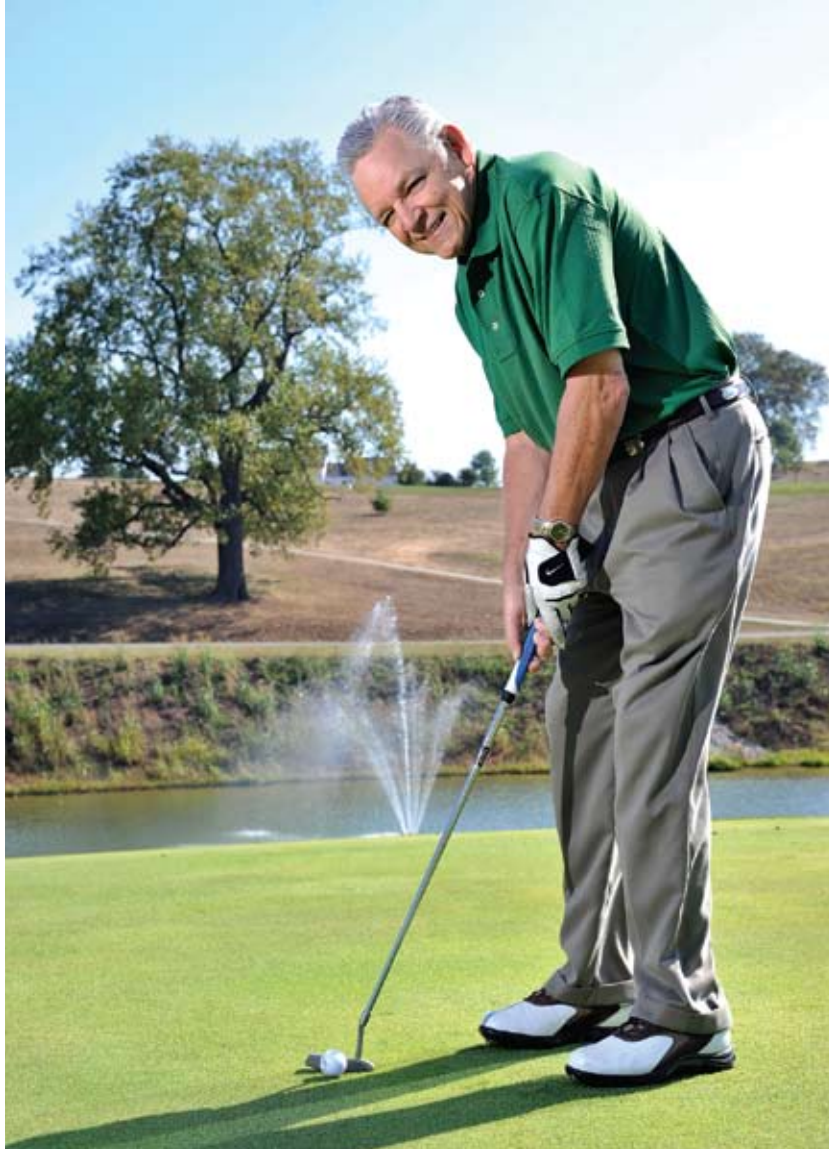
"Now that I'm older, the pump is simply a convenient option for me," she continues. "It keeps me from having to answer awkward questions at work about needles, and it provides an easy way to give myself insulin on the go rather than worrying about keeping enough medical supplies on me at all times. While it doesn't simplify my diabetes at all, it allows me to work with my diabetes to better my life and adjust to change quickly."

*Thanks to his insulin pump, Gary Powell can play golf and keep a level blood sugar.*

Despite its advantages, the pump is not a “magic bullet” for people with diabetes. There is a risk of skin infections at the site where the insulin-delivery tube enters the skin, and if the pump malfunctions or any of the components clog, blood glucose levels can rise quickly. Pump users need to carefully enter carbohydrate intake information into the device. Certain pump components (reservoir, tubing, infusion set and the insulin itself) need to be changed every few days. Pumps and supplies can be expensive (although these costs are sometimes covered by Medicare and supplemental insurance plans). These factors — combined with the technological complexity of the pump — prompt some people to stay with insulin injections.

However, for many users, pumps offer flexibility, freedom and better glycemic control. Gary Powell says, “My pump has given me my life back, in a sense. I have it on my belt at all times, but other than that I don’t think about it. At meal-time, I put in the calculations and it does the work for me.”

If you are thinking about getting an insulin pump, ask your doctor or other knowledgeable health care provider for more information. Liberty Medical works with a nationwide network of certified pump trainers and has certified diabetes educators on staff who can help you decide if the pump is right for you. Call us at 1-800-597-8635. **HM**



## Primed to Pump?



Are you considering using an insulin pump? As you prepare to discuss it with your physician or certified diabetes educator, the Joslin Diabetes Center suggests that you ask yourself these questions:

- What are your expectations for how a pump will help improve your lifestyle?
- Are you comfortable with the technology and mechanics of operating a pump?
- Are you committed to checking your blood glucose at least four times per day?
- Are you committed to problem solving using a sophisticated understanding of insulin, carbohydrates and activity levels?
- Do you have a health care team that is familiar with insulin pumps?

For more information, visit the Joslin Diabetes Center online at <http://www.joslin.harvard.edu>.