



# life with Diabetes

JUVENILE DIABETES RESEARCH FOUNDATION INTERNATIONAL

SEPTEMBER 2006

## TOPICS IN TYPE 1 DIABETES

### Dealing with Overnight Lows

Alarming episodes of hypoglycemia—low blood sugar levels—are a source of real concern to parents of children with type 1 diabetes. Because hypoglycemia can have serious consequences, it requires careful, ongoing vigilance and management not only throughout the day but also at night. It is not unusual for parents to discover that in the middle of the night, blood sugar levels might drop to levels they were previously unaware of.

In the past few years, with the advent of new glucose monitoring systems, researchers have gained the necessary tools to allow them to understand what causes patients to “go low” overnight. One of the reasons that sleep poses hazards is that the brain is sleeping too: since brain activity diminishes during sleep, it’s using less fuel. Other factors that can result in nighttime low blood sugar episodes are: too much insulin in circulation; the normal release of growth hormones overnight, which can reduce the need for insulin; intense exercise during the day; and erratic eating patterns such as skipping a meal or not eating enough.

What’s more, research like the Diabetes Control and Complications Trial (DCCT) has noted that tight glucose control, while helping to reduce the risk of diabetic complications, can increase the risk of hypoglycemic episodes. Patients who are in tight control can make adjustments to their regimen during the day, but during an eight-hour sleep cycle, say researchers, the body can be like an airplane without a pilot.

[CLICK HERE TO READ MORE.](#)

## ASK A PARENT

### Help from JDRF's Online Diabetes Support Team

**Q:** *I am very frightened of low blood sugar in my 10-year-old son, who was diagnosed less than two weeks ago. This is our first full day home from the hospital, and I feel like I am just waiting for the other shoe to drop. Any suggestions?*

Episodes of hypoglycemia (low blood sugar) can be alarming, particularly to families dealing with a new diagnosis. But there are keys to dealing with lows, and strategies to reduce their frequency and severity. A parent and volunteer with JDRF’s Online Diabetes Support Team responds to a mother’s concerns.

[CLICK HERE TO READ MORE.](#)

## ASK A STUDENT

### Help from JDRF's Online Diabetes Support Team

I went on the pump six years ago, when I was 15. At the time, I really didn’t know very much about it other than it was something I had to wear all the time. Having something attached to me seemed like the uncoolest thing in the world. However, I also did not want to take a shot at school. Unfortunately, my A1C and my rising lunch blood sugar indicated that I would have to do otherwise. My doctor, who was actually a huge fan of pumps, gave me two choices: go on a pump or go on an astounding fifth shot. I went with the pump. [CLICK HERE TO READ MORE.](#)

## ASK A MEDICAL PROFESSIONAL

### What Your Child's School Should Know About Insulin Pumps

Children with diabetes are using pump therapy in greater numbers than ever before. When students with diabetes make the leap from injection therapy to insulin pump therapy, everyone involved in their care—including school nurses and health staff members—must be prepared to make the leap with them. All adults responsible for the student with diabetes during the school day should have a basic understanding of how the pump works and when they may have to intervene or troubleshoot.

[CLICK HERE TO READ MORE.](#)

## WHAT'S NEW ON THE JDRF WEBSITE?

JDRF’s KidsOnline has special sections for young readers on both of this month’s topics. In “Pump Diaries,” seven young people share their experiences with using the pump, and “Down But Not Out” explains how low blood sugar happens and what to do about it. Go to [HTTP://KIDS.JDRF.ORG](http://kids.jdrf.org).

## WHAT A JDRF CHAPTER CAN DO FOR YOU

### Guidance and Support

Whether your child is a toddler, starting school, a highschooler, or leaving for college, life with diabetes can be scary and frustrating at times. JDRF New Mexico in Albuquerque has formed a networking group called TOFUN (Type One Families United Network) so that families can meet other families at events that include fun activities and educational programs. Go to the JDRF website at [www.jdrf.org](http://www.jdrf.org) to find support activities at a chapter.

You can let us know what you think of *Life with Diabetes* or subscribe today by sending an e-mail to [info@jdrf.org](mailto:info@jdrf.org). In subscription request, Please include **SUBSCRIBE LIFE WITH DIABETES** in the subject line.

## TOPICS IN TYPE 1 DIABETES Dealing with Overnight Lows

*continued from page 1*

As a result, many parents monitor children for overnight lows. Annette Flygare discovered through routine nighttime checks that her son Mitch, 13, typically runs low as many as two nights a week after days of particularly vigorous exercise. So she began to feed him during the night between 1 and 3 a.m. to correct his lows. “Even though Mitch is sleeping, his body doesn’t seem to slow down after games,” she explains. “Once I saw a trend, I started checking him every night. Now that we have a handle on his patterns and made some adjustments, I check him before I go to bed, and depending on his number or activity level, I may get up and check him again in the early morning hours. If he’s low, we treat him with yogurt, juice, or a sports drink.”

Doctors and diabetes educators can help patients and families like the Flygares plan meals, snacks, and insulin doses to get young patients through the night when they’ve been extra active during the day. An important key is consistent blood glucose monitoring—before meals and snacks, before and after exercise, at bedtime, and, occasionally, in the middle of the night. Doctors recommend that families record all pertinent data, including blood sugar levels, carbohydrate intake, and insulin dosage, and then with their diabetes health care practitioners, review the results and patterns over time, and make any necessary changes in the daily routine.

### Progress on the Horizon

An important form of relief slowly becoming available on the market are glucose monitors that could sound a warning when needed, allowing parents an extra bit of comfort. Several of these devices have been approved over the last year by the Food and Drug Administration (FDA). In April, the first device that integrates an insulin pump with a real-time continuous glucose monitor, the MiniMed Paradigm, received FDA approval, another step toward the development of a so-called artificial pancreas that is a major JDRF research priority. Ultimately, researchers envision a day when a sensor would take readings, calculate, and respond with the correct dosage instructions to a pump that would infuse the insulin. Lows would sound a warning alert.

“In the meantime, we tell people to get the best possible diabetes control they can, and that we can do very well with what we have now,” says Yale University’s Dr. William Tamborlane, a pioneer in hypoglycemia studies in type 1 diabetes. “Many patients are achieving levels of control today that we never thought possible 25 years ago, when I first began to tackle this problem.”

*Adapted from “Overnight Lows” by Julie Mettenburg, Countdown*

*Magazine, Summer 2006. For further information on hypoglycemia, visit the JDRF website at [HTTP://WWW.JDRF.ORG/HYPOGLYCEMIA](http://www.jdrf.org/hypoglycemia). New monitoring devices are reviewed on the Children with Diabetes site: [WWW.CHILDRENWITHDIABETES.COM/CONTINUOUS.HTM](http://www.childrenwithdiabetes.com/continuous.htm). Read one parent’s strategy for dealing with hypoglycemia in “Ask a Parent,” below.*

## ASK A PARENT

### Help from JDRF's Online Diabetes Support Team

**Q:** I am very frightened of low blood sugar in my 10-year-old son, who was diagnosed less than two weeks ago. This is our first full day home from the hospital, and I feel like I am just

**A:** waiting for the other shoe to drop. Any suggestions?  
Low blood sugars can be nerve-wracking. Some situations are quite simple to correct, while others may be a bit trickier. I distinctly remember one of our first days home from the hospital after our son, Steven, was diagnosed at age seven when his blood sugar was very low (in the 20s!) after he had fallen asleep. It later turned out he may have been taking more insulin than he needed during the “honeymoon” period after diagnosis. For some time after that scare, we checked Steven in the middle of the night, every night (and we still do occasionally). And there were a few times when we have had to give him something to eat or drink at 2 a.m. But those evenings became less frequent, in great part due to the pump, which has helped Steven even out the swings in blood sugar levels. The pump also made it easier to control “lows,” since it lets you adjust the basal rates when needed, such as during sports.

As a general matter, our son will sometimes feel “low” if he takes too much insulin with his food, or if he exercises or plays soccer, lacrosse, or football. He always carries a bag in which he has a glucometer, glucose tablets, water, juice or Gatorade, and some cookies or crackers. This is really important, because there are many times when your son will not be with you and will just want to do whatever he usually does with his buddies. Diabetes makes our kids become more responsible more quickly than they might otherwise be!

At home, when Steven feels low, he prefers to drink orange juice to bring his blood sugar level up. We check again in 15 minutes to make sure the blood sugar has risen; otherwise, if it is still low, we treat him again with another 4 ounces of juice or glucose tablets. Many diabetes educators recommend giving a simple sugar to increase the glucose level quickly and then a sugar with fat or protein to sustain the blood sugar. It’s best to seek advice from your doctor or health team member, since what works for one person may not work as well for another.

The trick with handling lows is for your son to know when

he feels them and for you to recognize some of the signs of lows. Typical symptoms include shakiness and weakness. Steven will sometimes look pale or become a little dazed when his sugar is low, and we will say “Steven, are you low?” to which he usually answers, “Yeah, I think so!” Especially in the beginning, I’d recommend checking your son’s blood sugar a lot—we checked up to 10 times a day, something I’ll still do when I see our son’s numbers starting to trend low or high.

Other things I have noticed with Steven over the years are times when his blood sugar will drop for no apparent reason. Or sometimes he’ll vomit because of a stomach “bug” after he has just taken his insulin, which makes me a bit more concerned. On these occasions, after calling our diabetes nurse educator, I have had to give him an injection of glucagon. So I think it is very important to be comfortable knowing how to mix the solution and knowing that at times, it may be necessary to use it.

Finally, let me emphasize that there is nothing that my son does not do because of his diabetes. He plays every sport: he is the star goalie on his school lacrosse team, and skis with his pump; he is an excellent student, and he goes to sleepaway camp. Despite the adjustments, dealing with lows is manageable.

*Have a question? Go to the JDRF Online Diabetes Support Team at [www.jdrf.org](http://www.jdrf.org).*

## ASK A STUDENT

### Going on the Pump: A Young Adult Perspective

By Allison Blass

*continued from page 1*

The process of adapting to my pump took approximately six months. My parents and I took classes in carb-counting (which are vitally important), and on basic pump management. Gradually, my reluctance gave way to enthusiastic acceptance.

These days, whenever I attend a diabetes event, someone eventually notices that I wear an insulin pump. I don’t make any attempts to hide it. The pump clips onto my pocket, with the wires hanging out, loud and proud. Most parents will ask, “Do you like the pump?” followed by, “Why?”

I tell them first that I’m a fan of pumps: I like how they replace injections (big plus) and scheduled meal plans (heaven-sent). I tell them that unpredictable schedules or erratic blood sugars are common reasons to go on the pump. Pumps mean the freedom to do things you enjoy without having to “preprogram” your life, like spending more time with your friends, going to a diner after football games, having New Year’s Eve parties, and going on vacations more easily because you can adapt better to the unpredictable nature of travel.

Then I tell them that choosing to get a pump will completely alter the way young patients and their parents manage the disease. Pumps are no longer the new kids on the diabetes block: children

who wear them have been shown to have lower A1Cs than children on daily injections. But I also add that it’s important to know that pumps are not for people looking for an easy way to avoid diabetes management. Having freedom also means using that freedom responsibly. The pump is not a pancreas. It will not test your blood sugar (despite the fact you wish the tubing was bi-directional, it isn’t). It will not program your insulin dose. And it will not make adjustments for stress, exercise, or hormones. Although it’s tempting to just push the buttons, frequent testing helps correct dose boluses (meal-time insulin) and check the basal rates (background insulin). If frequent testing is not something your child or teen is prepared for, the pump should be put on hold.

The pump can, however, give a false sense of security. Most pumps today are “smart pumps” and can calculate a dose based on preprogrammed ratios, sensitivity factors and previous doses. But pumpers should be aware of how their pump works so they are able to make adjustments based on other information the pump doesn’t have, like the type of food, activity level, and hormones. It’s also important to keep track of the ratios and insulin amounts on your own, in case the pump breaks (as technological devices are prone to do). In sum, a pump is another tool—a convenient, adaptable tool, and a great aid to kids and teens seeking more independence—but a tool nonetheless. It’s not a replacement for the individual and the knowledge of diabetes you must possess.

*21-year-old Allison has been pumping for 6 years. She would like to thank her friend, 20-year-old pumper Megan Howe, for her editorial assistance.*

## ASK A MEDICAL PROFESSIONAL

### What Your Child’s School Should Know About Pumps

By Catherine Marschilok, M.S.N., C.D.E., Board Certified in Advanced Diabetes Management

*continued from page 1*

#### Handling Common Problems

Even with diligent self-care, pump problems can occur during the school day and may require the intervention of the school nurse or other school health personnel. The cannula (insertion tube) can accidentally fall out or get pulled out, or can become obstructed, interfering with insulin absorption. When a student has used more insulin than usual since the last site change, the pump can run out of insulin.

#### TO BE SAFE WITH INSULIN PUMP THERAPY IN SCHOOL, STUDENTS MUST:

- Check their blood sugar multiple times throughout the day
- Respond to blood sugar readings
- Receive help when blood sugar levels are low or high
- Never go to the nurse’s office or anywhere alone when they are experiencing high or low blood sugar episodes

If steady delivery of insulin is compromised, the blood sugar rises fast, and potentially dangerous high blood sugar symptoms escalate. Students must be able to respond quickly to any situation that interferes with steady delivery of insulin. They should either change the site in school, with help from a trained staff member, or they should take an injection of insulin to make up for missed basal doses.

### Care Plans for the Student with a Pump

All students who use insulin pumps should have a healthcare plan that carefully spells out the responsibilities of the school staff, the level of self-direction capabilities of the student, emergency contact numbers, permission to administer glucagon, and an alternative plan for insulin delivery. The student's insulin regimen should include current basal rates, bolus dose correction, target blood sugar, and bolus dose insulin-to-carbohydrate ratio. In the most current "smart pump" models, this information is programmed into the pump and the pump calculates the insulin dose.

School personnel have several options for obtaining training in insulin pump therapy: Diabetes educators and pump

manufacturers often provide training for school staff. The back cover of most pumps lists a toll-free telephone number for technical assistance or for obtaining additional copies of user manuals from manufacturers. And most children who use insulin pumps live with adults who are very involved in their diabetes care and are trained in use of the pump.

Finally, remember that if you and your child are new to diabetes, it can take a lot of time, effort, and energy to climb up the learning curve. When you start down the pump path, you may "slip back" down the curve a bit before climbing confidently back up. Try to remember that you are in good company. Increasingly, people of all ages are benefiting from the positive changes pump therapy has made in their lives. If the going gets rough for you, reach out to the people who have been there and to the pump company's clinical support staff. And be proud of your family and your school staff for taking the leap.

*For more information about healthcare plans for schools (and sample plans), go to [WWW.JDRF.ORG/DIABETESINSCHOOL](http://WWW.JDRF.ORG/DIABETESINSCHOOL).*

*Catherine Marschilok wrote about "Smart Pumps" in the December 2005 issue of the JDRF Life with Diabetes, available on [jdrf.org](http://jdrf.org).*

#### TO ASSIST STUDENTS WITH DIABETES WHO USE PUMPS, SCHOOL HEALTH PERSONNEL SHOULD ACHIEVE TECHNICAL COMPETENCE WITH SIMPLE PUMP THERAPY TASKS, INCLUDING:

- Inserting the pump cannula
- Delivering bolus insulin through the pump
- Checking pump memory to see the time of the last bolus dose
- Troubleshooting to determine if there is a problem with the pump
- Replacing batteries

#### THE FOLLOWING BACK-UP SUPPLIES SHOULD BE AVAILABLE IN THE HEALTH OFFICE:

- batteries
- two infusion sets
- two insulin reservoirs
- insulin bottle
- traditional syringe or insulin pen and pen needle
- alcohol wipes
- a user manual for the pump the student uses
- a quick programming card
- ketone strips
- supplies for testing blood sugar
- a glucagon kit and glucose tablets