

TOPICS IN LIVING WITH TYPE 1 DIABETES

Advances in Diabetes Management: The Continuous Glucose Monitor

Self-monitoring of blood glucose is one of the most important advances in diabetes management since the discovery of insulin. And the latest technology in monitoring devices offers a feature that promises significant new benefits for patients: the ability to read glucose continuously (or near continuously), and provide information on blood glucose trends.

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ASK A MEDICAL PROFESSIONAL

Managing Diabetes: You and Your Doctor

As a key component of your diabetes treatment, regular medical check-ups allow you or your child to lead a healthy and active life with diabetes. As part of these check-ups, you can expect to undergo a number of monitoring and diagnostic tests, which will allow your doctor—or your medical team—to chart your progress, prescribe and make adjustments to your daily management, and check for any signs of problems. Kathy Spain, a registered nurse and a certified diabetes educator, offers a number of tips to help you become a better informed patient and make the most of your medical appointments.

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ASK A PARENT

Help from JDRF's Online Diabetes Support Team

Q: My 7-year-old daughter was diagnosed only a few weeks ago. We're all in something of a panic again, because the start of school is practically here. What should we be doing about school?

A: *from a parent of a child with diabetes:* School is a challenging prospect for every parent of a child newly diagnosed with type 1. When my 7-year-old son, David, was diagnosed last year, he only missed two days of school. We didn't want him to think that diabetes was something that should keep him out of school or that he was any different now that he had diabetes. However, sending him to school so quickly gave us little time to work with our school, and since he was the only student there with diabetes, we had a lot of preparing to do. The first week was very hectic.

For all parents, school is the one place where we have to entrust our children to the care of others. What we find works best is giving all adults responsible for our son's care a basic rundown of diabetes, in general, and David's specific treatment plan, in particular. That list includes David's teachers, the principal, the physical education staff, and the cafeteria manager. However, meeting with them all is a bit overwhelming, not too mention very difficult to arrange.

As a result, we put together a document containing the information, and we bring several copies when we meet with David's primary teacher, principal and nurse at the beginning of each year. In turn, the nurse meets with the rest of the staff to discuss David's specific care. We also include David's photo and special instructions for a substitute teacher, who may not have a clue about diabetes.

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WHAT'S NEW ON THE JDRF WEB SITE?

Human clinical trials are a key aspect of JDRF's search for a cure, turning research advances into cures and therapies. For example, a new trial conducted by the U.S. National Institutes of Health is testing a treatment aimed at stopping the immune system from destroying beta cells in patients with new onset type 1 diabetes. To learn more about clinical trials such as this one, and to see a complete list of trials looking for volunteers, go to the [Clinical Trials](#) links posted on the JDRF Web site home page, under "Newly Diagnosed."

WHAT A JDRF CHAPTER CAN DO FOR YOU

JDRF volunteer Nancy Jones, a board member at the JDRF Bay State Chapter in Massachusetts, conceived the JDRF Networking Coffee as a way to bring together people with diabetes and their families to share concerns, issues, and tips. She advertised her first Coffee on flyers she distributed to students in her son's school, and was rewarded by 25 parents arriving on her doorstep. The concept of Networking Coffees took hold, and today at more than 20 JDRF Chapters, volunteers like Nancy are hosting such gatherings as an opportunity for type 1's and their families to talk, share information, or listen to presentations on topics like diabetes camps, exercise and nutrition. If you are interested in finding a Networking Coffee in your area or starting one of your own, please contact Jill Gonyea at jgonyea@jdrf.org or by calling 770-395-5987.

TOPICS IN LIVING WITH TYPE 1 DIABETES

Advances in Diabetes Management: The Continuous Glucose Monitor

Self-monitoring of blood glucose has been called the most important advance in diabetes management since the discovery of insulin. A few decades ago, blood glucose testing was restricted to a doctor's office. Today, these hand-held devices provide results at home in seconds. Some 25 glucose monitors are approved by the U.S. Food and Drug Administration and marketed in the U.S. Most of these are fingerstick measurement meters, considered the standard for measuring blood sugar levels in type 1 diabetes patients. But the newest devices—with three approved so far by the FDA—offer a significant new benefit: the ability to read glucose continuously, or near continuously.

How do the two methods differ? Conventional fingerstick glucose meters allow you to read a glucose value at a single moment in time, much like a snapshot from a camera. By contrast, continuous glucose monitors capture a continuous narrative of blood glucose activity, like the string of images that make up a film. The narrative provides a clearer picture of blood glucose levels throughout the day, helping you and your doctor to determine how diet, exercise, medication and lifestyle are affecting daily blood sugar levels, and allowing you to take remedial action to bring blood sugar levels under tighter control.

Continuous monitoring devices are minimally invasive, meaning that they barely penetrate the skin. They collect interstitial fluid found between the body's cells, rather than blood. They are intended to supplement, not replace, conventional meters; nevertheless, the additional information they provide may prove invaluable. "Ultimately, it may be more important to know which way your glucose levels are heading than what your exact reading may be," says JDRF Scientific Program Manager Aaron Kowalski, who has type 1 diabetes. "That's where the technology is heading and diabetes self-management is probably going to be reoriented around identifying trends and taking measures to prevent extreme highs or lows."

CONTINUOUS MONITORS NOW AVAILABLE

In August, the FDA approved the Guardian RT Continuous Glucose Monitoring System. Manufactured by Medtronic, Inc., the system uses a disposable sensor that is inserted under the skin in the abdominal area. Glucose readings are transmitted to a pager-size monitor, which displays real-time glucose levels every five minutes for up to three days, and records the data for downloading to a personal

computer for trend analysis. The monitor is also equipped with an alarm that alerts patients when their blood glucose levels become too high or too low, enabling them to adjust insulin dosage or diet to return to a normal level. After three days, the sensor must be replaced. The system is currently being sold only in selected U.S. cities while the manufacturer continues to evaluate training, education, and reimbursement fees. The Guardian requires a physician prescription.

Currently, the only other continuous glucose monitors approved for use by the FDA are Medtronic's CGMS System Gold, an earlier generation of the Guardian RT, and the GlucoWatch G2 Biographer, a wristwatch-like device marketed by the Animas Corporation. However, several other devices are in development, and at least two—from Abbott Laboratories and DexCom—are now moving through the FDA approval process.

THE FUTURE

Continuous monitors represent an important step toward the ultimate goal, a so-called "artificial pancreas." An artificial pancreas is a medical device that would combine two tasks—glucose sensing and insulin delivery—through a "closed loop" system that would mimic the human pancreas, registering blood sugar levels and, in response, delivering the necessary amount of insulin. Perfecting an artificial pancreas is one of the priority goals in JDRF's research program.

ASK A MEDICAL PROFESSIONAL

Managing Diabetes: You and Your Doctor

By Kathy Spain, R.N., C.D.E.,
Mother of Will, age 10, diagnosed age 2

Your physician—a primary care physician or an endocrinologist—or coordinated healthcare team will provide you with helpful advice, information, and care, but you must take the initiative in managing diabetes. After you've established a daily management plan with these health professionals, you're ready for the next step, which is to make a commitment to maintaining an ongoing relationship with your medical team.

You should expect more frequent visits to the doctor than before diagnosis. The National Institutes of Health advises that medical follow-ups for a person newly diagnosed with type 1 diabetes should occur weekly until good control of blood glucose is achieved. After that, all type 1 diabetes patients should see their doctor at least once every three months. More frequent visits may be necessary when a patient's blood glucose remains poorly controlled.

During your checkups, you will start undergoing regular diagnostic tests or treatments during office visits. Seeing your doctor for these tests, and following other routines, such as going to the dentist regularly, are important, because these medical professionals look for conditions associated with diabetes. Test results will help your doctor determine future treatment for you or your child. Here are some of the tests you should expect:

Monitor blood sugar levels: Daily blood sugar testing is one of the best ways a doctor has to evaluate everyday management of diabetes and determine the effectiveness of the treatment plan. Your doctor should evaluate your blood sugar meter results at each visit.

Test for Hemoglobin A1c: The “A1c” is a blood test that reflects the average blood sugar control over a 2 to 3 month period, allowing the doctor to evaluate the effectiveness of the treatment plan. The test is usually repeated every three months. For people without diabetes, the normal range for the A1c test is between 4 to 6 percent. The goal for people with diabetes is to have an A1c of less than 7 percent. Research studies have shown a decreased incidence of diabetic complications in those with A1c levels in the goal range.

Monitor height and weight: Doctors will monitor height and weight in children with diabetes to assure that a child is growing normally.

Monitor blood pressure: Since high blood pressure can lead to complications, blood pressure should be tested at each doctor visit. Before diagnosing high blood pressure, doctors take readings on three separate days. Children with diabetes need to keep their blood pressure within the levels appropriate for their age. (Normal blood pressure levels for a child’s age, sex, and height are available at [www.nhlbi.nih.gov/health/ prof/heart/hbp/hbp_ped.pdf](http://www.nhlbi.nih.gov/health/prof/heart/hbp/hbp_ped.pdf).)

Monitor blood fat levels: Lipid levels are important to monitor since high levels of cholesterol and triglycerides can also contribute to diabetic complications. Everyone with type 1 diabetes should have their lipid levels screened at diagnosis when their daily care regimen is established. If the results are normal, then the lipid screen should be repeated every 4 years. If abnormal, tests are repeated more often.

Get an annual flu shot: The yearly flu shot is recommended for all people with diabetes. At present, the live oral/nasal form

of the flu vaccine is not recommended. Instead, patients should receive their flu vaccinations by injection. Flu shots are given in the fall months.

Test for thyroid disease: In patients with type 1 diabetes, thyroid disease is the most common additional autoimmune disease to develop. Some estimates are that it occurs in as many as one third of those with type 1 diabetes. Screening is done through simple blood tests.

Test for celiac disease: Celiac disease, the second most common autoimmune disease associated with type 1 diabetes, occurs when the body is unable to digest gluten (wheat protein). Screening is accomplished through a blood test. Many physicians recommend screening at time of diagnosis and every four years thereafter. Celiac, like thyroid disease, can develop subtly, without obvious symptoms, making screenings imperative. (For more information on celiac and diabetes, see the May 2005 issue of the *Life with Diabetes* e-newsletter on the JDRF Web site at www.jdrf.org.)

See your dentist: Good oral health is essential for all people with diabetes. Schedule a thorough dental cleaning and examination every six months, informing your dentist and hygienist that you have diabetes.

Screen for complications: The good news is that because most doctors and most patients adhere to a treatment plan calling for tighter control, the incidence of long-term complications related to the eyes, kidneys, nerves and cardiovascular system are increasingly less common in children with type 1 diabetes. Your ultimate goal—and your doctor’s—is not to see any long-term complications, ever. Nevertheless, many doctors take baseline kidney, liver function, and eye exams soon after diagnosis, and may repeat those tests at varying intervals. Such baseline tests help your doctor make sure that no underlying problem existed before diabetes occurred.

TAKING CONTROL

Being informed about these medical tests is a part of effective self-management, and provides you with a good way to open up communication with your doctor. Ask questions if you see that the test results are not falling within the normal ranges or being given in the recommended frequency.

In addition to the critical information provided by these tests, you can do your part at home as well. Get into the habit of

keeping complete records. Your home blood glucose monitoring record is, of course, essential, but a record of blood sugars alone is not enough. If you're not already doing so, begin recording insulin doses, carbohydrate intake, physical activity, and other pertinent events (such as illnesses, stresses, etc.) along with the blood sugars. That way, you and your healthcare team will have specific information to create an effective diabetes care plan for you or your child.

Bottom line: Improved blood glucose management and treatment advances are helping people with diabetes to lead healthier lives and prevent or delay complications. With you as the lead member of your diabetes team, you can make a real difference.

ASK A PARENT

Help from JDRF's Volunteer Families, *continued from page 1*

If your daughter is attending a public school, federal law calls for students with diabetes to set up a 504 plan to outline a care regimen that is approved by the school district, your primary diabetes physician, and most importantly, you. You can learn how to create your own plan by clicking on the Life with Diabetes section of the JDRF Web site at www.jdrf.org.

Beyond that basic plan, you should know that every school district and individual school handles a child's specific medical condition differently. Each state has different laws and rules that can possibly restrict what teachers and school staff (other than nurses) can or can't do, including where your daughter can test her blood sugar. You need to check on the regulations governing your daughter's school.

Finally, you should provide the school with necessary supplies to treat your daughter's diabetes. We arranged to place an emergency kit in each room our child will visit during the day. The kit should contain juice, glucose tablets, or other snacks to treat symptoms of low blood sugars. We also put together a larger emergency pack that contains an extra meter, sugar tablets, and other important supplies that is stored in the school nurse's office.

When our son first went back to school, he had to have a snack at 10 a.m. every day, which did not coincide with normal class snack. You cannot rely on teachers or nurses to remember who gets a snack every day. So we bought our son a watch and set the alarm for 10. When the alarm goes off, he and his teachers know it's time for his snack.

Because our son is only 8, we do require that he does all his testing and bolusing (giving insulin from his pump to cover meals) in the nurse's office. We also require that someone accompany him to the nurse if he feels low.

It is also important to develop a communication plan with the school, particularly for emergencies, but also for daily concerns. Make sure everyone responsible for your daughter's well-being knows whom to call. Don't assume that your school knows all about diabetes care—you probably knew little or nothing about its daily complexity before your daughter was diagnosed.

I hope this gets you started. The best way to get local information is through your local JDRF chapter where you can meet other parents in your school or school district. We've found that meeting and talking with other parents has taught us what to ask and what to look for in taking care of our son's diabetes.

Have a question? Go to the JDRF Online Diabetes Support Team at www.jdrf.org.