

## TOPICS IN TYPE 1 DIABETES

### Exercise, Sports, and Diabetes: Going for the Goal

Physical exercise is important for everyone's health and well-being, but it's especially important for people with diabetes. The steps a person with diabetes takes to improve overall fitness can be greatly beneficial, because regular exercise helps lower blood sugar levels and keep them in target range. Exercise physiologist Gary Scheiner, M.S., C.D.E., provides proactive diabetes management tips that will ensure healthful and safe physical activity. Included is a helpful checklist and resources for communicating with coaches and school staff.

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## ASK A MEDICAL PROFESSIONAL

### Pumps Get Smarter

Benefiting from more than 30 years of product development, today's insulin pumps are convenient to carry, safe, and easy to use. The newest "smart" pumps actually do the diabetes math for you and your child. Certified pump educator Catherine Marschilok, M.S.N., C.D.E., details how the newest pumps work and shows how their reliable yet highly flexible insulin delivery offers increased freedom in diet and lifestyle choices.

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## ASK A PARENT

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

**Q:** Since his diagnosis two months ago, my 12-year-old son has been more and more frequently sitting on the sidelines during his sports games and school gym classes because he's anxious about highs and lows. We want to encourage him to participate as he always did before his diagnosis. What can we tell him and the school to get him "back in the game"?

**A:** *from a parent of a child with diabetes:* The most important advice I can offer to you or any family facing a child's new diagnosis is that he should take control of his diabetes and not let it control him. He shouldn't be afraid to be as active, or even more active, than he was prior to his diagnosis; exercise is very beneficial to him, as our diabetes educator emphasized when our daughter Kate was first diagnosed. Once our daughter took control of her diabetes—and it took a few months—everything was so much better. Today, at 12, she is a black belt in karate and plays volleyball, in addition to being an all-around active kid.

Kate has several things she does to make sure she can enjoy a sports game or gym session without worrying that she is going to get low blood sugar in the middle. She checks her blood sugar at least an hour before the physical activity, again immediately before, during (if needed), and also a few times afterward. That way she can make any necessary corrections. She doesn't play if her blood glucose is below the lower end of her normal range. During exercise, a high blood sugar episode is just as bad in the long term as a low one. Make sure you check with your educator or doctor for the ranges within which it is safe for your son to play or exercise.

Our daughter has left karate classes early when she felt low or "funny," and your son shouldn't feel bad or embarrassed to do the same. If he does ever leave during a game, always make sure someone knows why he left early. He should never go off by himself if he's feeling low/high or knows that he is. Someone else, preferably an adult, should always walk with him to the nurse's office if the need arises.

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## WHAT'S NEW ON THE JDRF WEB SITE?

### Holiday Help

The holidays usually mean many changes to your daily life, and when you have a child with diabetes, the holiday season can be a challenging time of year. With the extra carbs in festive meals, changes in your normal schedule, and excitement that can send blood sugar swinging, extra monitoring of blood sugars becomes essential. A positive attitude and some careful extra planning can help you overcome these challenges and have a wonderful holiday season. Check out "Holiday Tips" on the JDRF Web site at <http://www.jdrf.org/holidaytips>.

## WHAT A JDRF CHAPTER CAN DO FOR YOU

### Guidance and Support

JDRF chapters throughout the U.S. offer resources to support families in the stressful time after a diagnosis of diabetes. Our volunteer families, who have "been there" and know what you are going through, provide guidance and support. Special JDRF programs for the newly diagnosed include our Bag of Hope and Teen Pak kits, networking coffees, and fun outings. All offer a wealth of comforting help and information. Go to the JDRF Web site at [www.jdrf.org](http://www.jdrf.org) and click on "Locations" to find the JDRF chapter nearest you.

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

### Exercise, Sports, and Diabetes: Going for the Goal

Kids with diabetes can play and succeed at sports just like their non-diabetic peers. A recent survey of 150 children, ages 3 to 17, attending JDRF's 2005 [Children's Congress](#) provides dramatic proof. These kids with diabetes engage in dozens of different activities, from hiking the Grand Canyon to climbing on kitchen counters (3-year-old division). They ski and skate and ride bikes, scooters, skateboards, snowboards, wakeboards, knee-boards, and river rafts. They wrestle, jump on trampolines, and play varsity football. They've won first place in competitive roller hockey, sailing, softball, karate, cross-country, soccer, swimming, dirt biking, snowmobiling, and cheerleading.

Through their achievements, these youngsters send the critical message that kids with diabetes can participate fully in sports and physical education activities of virtually every description. And with new and more effective approaches to diabetes management, such as sophisticated, portable testing equipment and "smart pumps" (see "Ask a Medical Professional," below), no physical activity should be ruled out.

#### The Benefits

Physical exercise is important for everyone's health and well-being, but it's especially important for people with diabetes. For everyone, regular exercise produces such important benefits as cardiovascular fitness, improved muscle tone and strength, lower blood pressure, help with weight control, positive effects on mood and stress, and the development of self-confidence and self-esteem. "But physical fitness and a sense of well-being may be even more essential for people with type 1 diabetes than they are for anyone else," says exercise physiologist Gary Scheiner, M.S., C.D.E., head of Integrated Diabetes Services in Wynnewood, Pennsylvania. "The steps you take to improve overall fitness—even if they're only small steps—will often result in improved diabetes management."

The reason? Regular exercise helps lower blood sugar levels and keep them in a target range. In working harder, the body uses more glucose to produce energy and improves the way insulin works. Blood glucose levels are lowered and insulin requirements are reduced. The benefits are great, but there are challenges. Kids with diabetes must be careful about when, how long, and how intensely they exercise, and they must take steps to avoid hypoglycemia—going too low—during or after the activity.

#### Achieving the Goal

Success in any physical activity for a person with diabetes begins with proactive diabetes management. "Avoiding hypoglycemia is a goal kids can realize through good planning and constant vigi-

#### Checklist: Actions for the Coach and Physical Education Instructor

- Encourage exercise and participation in physical activities and sports for students with diabetes as you would for other students.
- Treat the student with diabetes the same as other students, except in meeting his or her medical needs (remember to respect the student's right to privacy and confidentiality).
- Make sure blood glucose monitoring equipment is available at all activity sites, and encourage the student to keep personal supplies readily accessible.
- Always allow the student to check blood glucose levels.
- Understand and be aware that hypoglycemia can occur during and after physical activity and that a change in the student's behavior could be a symptom of blood glucose changes.
- Be prepared to recognize and respond to the signs and symptoms of hypoglycemia and hyperglycemia, and when a blood sugar event occurs, take initial actions in accordance with the student's school plan.
- To treat hypoglycemia, provide the student with immediate access to a fast-acting form of glucose. Consider taping three or four glucose tablets or hard candies to a clipboard or include them in the first aid pack at physical activities, practices, and games.
- Communicate with the school nurse and/or trained diabetes personnel regarding any observations or concerns about the student.

(Adapted from the National Diabetes Education Program publication, *Helping the Student with Diabetes Succeed: A Guide for School Personnel*)

#### For Further Information:

Have a question about your child's physical activities? Contact JDRF's Online Diabetes Support Team at <http://www.jdrf.org> (left side of page), which is made up of JDRF volunteers who live with diabetes and are available to offer you immediate, one-on-one support. Certified Diabetes Educators at <http://www.integrateddiabetes.com> can answer your questions about diabetes and its care. Information can also be obtained from the Diabetes Exercise and Sports Association at <http://www.diabetes-exercise.org/index.asp>. To learn how to create a 504 or other educational plan, go to <http://www.jdrf.org/diabetesinschool>.

lance,” says Scheiner. Good planning means monitoring glucose both before and after exercise, always having glucose tablets or a high-energy snack on hand for unexpected lows, and drinking extra water to prevent dehydration. The young athlete must coordinate exercise with diet and insulin therapy, making adjustments in insulin dosing or snacking. Keeping a record of exercise and physical reactions is important, says Scheiner, because each child has his or her own unique response to exercise that can be observed through daily treatment adjustments, and because different types of exercise have different effects on blood sugar. Information to record includes blood sugar readings, foods eaten, the amount of insulin taken before exercising, the nature and length of the activity, and how the person performed and felt during and afterwards.

Scheiner says that it is usually not dangerous to exercise with a moderately high blood sugar level. He notes that adrenaline, which jumps during short bursts of competitive, high-intensity activity, can push blood sugar levels up. However, if pre-exercise testing reveals an unexplainable high blood glucose number (over 250), it may indicate there is not enough insulin in the body to allow for a safe exercise session. In that case, it is important to test for ketones in the blood through a simple urine or blood test. “Exercise is fine as long as ketones are negative,” says Scheiner, “but if ketones are positive, exercise should be postponed until insulin is given and the blood glucose number comes down.” (See “Ask a Parent,” for more exercise-related tips.)

If your child has recently been diagnosed with diabetes, achieving ideal control may take some time as you, your child, and your health care team develop and adjust an individualized treatment program. But soon your child will be safely exercising, whether in sports, physical activities, or just being an energetic kid. Remember, while many people with diabetes have reached high levels of performance, not every kid is a natural athlete or an avid competitor. But as our Children’s Congress delegates told us, being active covers a range of activities, from walking the dog to hopping on a skateboard. Wherever your child’s interest or ambition lies, the message is simple: *get going*.

## ASK A MEDICAL PROFESSIONAL Pumps Get Smarter

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

For millions of people with diabetes, insulin pumps offer a safe and viable alternative to the standard needle and syringe for injecting insulin. Clinical studies have demonstrated that pumps can achieve improvements in blood sugar control, with fewer low blood sugar episodes and better long-term control. While the decision to start your child with diabetes on the pump must

include your doctor and healthcare team, advantages like tighter glucose control and greater flexibility have led increasing numbers of children to go on the pump. Once you become familiar with pump therapy, you’ll see that there are many different reasons to consider this popular choice of insulin delivery.

### A Primer on Pumps

With over 30 years’ technological development behind them, today’s insulin pumps are convenient to carry, safe, and easy to use. A pager-sized computerized device that can be clipped to the belt or a pocket, the pump delivers insulin continuously to its user through a small tube, or cannula, easily inserted into the abdomen, buttocks, thigh or arm and held in place by an adhesive dressing. This insertion site must be changed once every 48 to 72 hours. Delivering insulin in precise amounts that can be closely matched to the user’s needs, pumps can hold enough insulin for two or three days. They use rapid-acting insulin, which has more predictable absorption than intermediate or long-acting insulin.

A boon to adults and young people alike, pumps also give you or your child the freedom to vary what, when, and how much she eats by enabling insulin delivery rates to be adjusted for different times of day. Pumps deliver insulin at two rates. **Basal** (also known as “background”) insulin delivery is the continuous dose of rapid-acting insulin that the pump delivers 24 hours a day, 7 days a week, with adjustments to accommodate special situations. It is the way most pump users receive approximately half their total insulin, supporting their body’s needs between meals. Basal insulin amounts are pre-programmed. **Bolus** delivery is a single dose calibrated to match the size and content of a meal, taking into consideration the amount of carbohydrates consumed and the user’s blood sugar level. Delivered when the user pushes a button on the pump, the bolus dose offers flexibility in meal quantity and meal timing. Insulin dosages are calculated after taking into consideration such factors as your child’s total daily insulin dose while taking injections, how well his diabetes is currently controlled, the frequency and awareness of low blood sugars, and a variety of lifestyle and nutritional issues.

With this more flexible form of delivery, your child can not only adjust insulin delivery to accommodate meals and snacks, but also reduce it when he exercises (so that blood glucose does not drop too low), or increase it during an illness (so that blood glucose does not go too high), among other daily variables.

### What Smart Pumps Can Do

The latest-model pumps, including those from the companies listed below, are referred to as “smart” pumps and are designed to simplify diabetes management. They have built-in dosage calculators that manage the complex diabetes math that users

previously had to perform themselves. This enables the user to program different basal insulin delivery rates for different times of the day, depending on changing needs (for example, reducing the basal rate before exercise, or changing the rate at night to help prevent overnight lows). Once the different rates are programmed into the pump, the user can switch rates by pressing a few buttons.

Among other important features, the newest pumps can calculate how much insulin is still working from the previous bolus dose (a feature called “insulin on board”). This facilitates more accurate calculation of the next bolus dose, and can prevent blood sugar from dropping low. Other smart features offered by some manufacturers include: programmable reminders and alerts, personalization features, information download capabilities, a carbohydrate database, variety in styles of infusion sets, and child lockout features.

Overall, smart pumps offer a consistency and accuracy of insulin delivery that was not possible in the past, since all calculations (other than counting carbohydrates and inputting the numbers accurately) are done by the pump. The end result: people like me (as a diabetes educator) and parents no longer have to worry about the accuracy of a child’s insulin dose depending on math and calculation skills.

Finally, if you, your child, and your doctor decide that pump therapy is appropriate, remember that frequent communication with your healthcare team will be essential. Pump candidates must be willing to check blood sugars frequently, count carbohydrates accurately, and learn new ways to manage diabetes. If you’re the parent of a younger child, it’s also important to remember that you’ll have to learn the ropes alongside your child. To read more

about what pumps can do, I encourage you to check out the manufacturer’s websites: [www.animascorp.com](http://www.animascorp.com), [www.delteccozmo.com](http://www.delteccozmo.com), [www.disetronic-usa.com](http://www.disetronic-usa.com), [www.minimed.com](http://www.minimed.com), [www.myomnipod.com](http://www.myomnipod.com).

## ASK A PARENT

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

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Make sure your son always has a few snacks or some juice with him (keep a container of juice tucked away in each of his classrooms), and that his gym instructor or coach knows your son has diabetes and how to recognize symptoms of low or high blood sugar. (Your son may not always recognize his own symptoms.) Always make sure that there is a glucagon kit in the nurse’s office and if possible one in the gym, and that the appropriate personnel know how to administer it. Once your son realizes that there are other adults besides you that can help, he’ll feel safer.

Above all, encourage your son not to feel afraid and to go ahead and enjoy any sport he wants to participate in. He’s definitely not benefiting socially, emotionally, or physically by sitting on the sidelines. He’s probably feeling very different from other kids right now. Finally, have you tried to see if there is any group (provided by the school or through your local JDRF chapter) for kids dealing with chronic illnesses? We have one in our chapter.

*Have a question? Go to the JDRF Online Diabetes Support Team at <http://www.jdrf.org>.*