

Physical Activity and Insulin-Requiring Diabetes

Enjoyable physical activity is part of staying healthy for all children. Exercise may cause changes in blood sugar levels. Children with diabetes should be active but may need to plan ahead for changes in blood sugar. Your diabetes team can help you plan so that your child can safely enjoy activity.

Goals

- Participate fully in desired activities or sports.
- Avoid low blood sugars during and after activity.
- Caregivers/coaches/athletic trainers understand the impact of activity on blood sugars and know what to do.

Benefits of Being Physically Active

Physical activity offers many benefits for your child's health such as:

- Strong muscles and bones
- Healthy heart and blood vessels
- More restful sleep
- Better mood, reduced stress and anxiety
- More energy
- Better coordination, balance and endurance
- Better in school
- Supports health for all body systems

In children with diabetes, physical activity helps to burn calories, helps insulin work better, and helps keep blood sugars in a healthy range.

Changes in Sugar Levels

Activity impacts how much sugar is in the blood. Activities that are aerobic and longer lasting tend to lower blood sugar levels and can increase the risk for low blood sugars.

Some forms of activity may increase blood sugars. These are usually activities that require a quick burst of activity like weightlifting, sprints, wrestling, etc. A surge of adrenaline causes the liver to release sugar with more intense sports. Some people need some insulin before these activities to keep sugar close to target range.

Closely monitor sugar levels using a CGM or blood sugar meter when your child is active. It can be helpful to keep notes about what you did to prepare for the activity and what sugar patterns your child had. Over time this can help you create a successful plan for managing blood sugars with activities.

Be Prepared

- Bring CGM and blood sugar meter and supplies with you.
- Always carry fast-acting carbs to treat low blood sugars (4 oz. juice, glucose tabs, small pack skittles, etc).
- Provide snacks as needed to prevent low blood sugar or to stabilize sugar levels after a low (e.g., cheese and crackers, nut or seed butter and vegetables, small sandwich).
- Bring plenty of water to drink during activity to prevent dehydration.
- Encourage your child to wear an approved medical alert bracelet during games. A nylon wristband with "type 1 diabetes" or "insulin dependent diabetes" is a good option. (Most WIAA rules allow a medical alert bracelet, but some may request that it is taped and visible.)

Organized Sports and Activities

Make sure that the caregiver, teacher, coach, or athletic trainer knows that you/your child has diabetes and takes insulin and can safely participate in the activity. Review what your child needs to stay safe during activity (i.e., monitoring sugar levels and treating low blood sugars). Also, think about who else needs to know how to give glucagon in case of an emergency low blood sugar (e.g., coach, sponsor, athletic trainer, caregiver, etc.). Think about adding school sports into your child's 504 plan. Make sure to give written instructions to the teacher, coach, or caregivers. This would include:

- Symptoms of high and low blood sugars
- Treatment for high and low blood sugars
- Emergency contact information

Checking Blood Sugars

- Monitor sugar levels before and after activity. Using a blood sugar meter should be done anytime you suspect or have treated a low blood sugar. **Do not** rely on CGM values when sugars have been or may be low.
- If activity is longer than 1 hour, monitor sugar levels every hour.
- Delayed low blood sugars can occur up to 24 hours after exercise. Set an alarm to check a blood sugar during your child's sleep at night. Make sure to do this on the days after sports tournaments, water or theme parks.
- Check ketones if blood sugars are 250 mg/dL or higher without a known cause. **Children with moderate to large ketones should avoid physical activity** and follow a sick day plan until ketones resolve.

Adjust Insulin for Activity

To avoid low blood sugars, plan ahead and give less insulin before the activity instead of adding extra food. If the activity is less than 2 hours after a meal, decrease the insulin dose given with the meal before activity. Most often, this means a change in the insulin to carb ratio. Your child's diabetes team will help you make a plan that works for your child.

Adjust Food for Activity

Even if you adjust insulin, you may also need to think about changing food choices around activity. Use these ideas below and the chart on the last page.

- Include snack choices with protein/carbs/fat such as:
 - ½ sandwich with protein
 - Crackers with cheese
 - Yogurt or yogurt drink
 - Mandarin orange (cutie) and cheese stick
 - Trail mix (nuts/seeds and dried fruit)
 - Pretzels and hummus
 - Small banana with 1-2 tbsp peanut butter
- Drink plenty of water to stay hydrated.

Automated Insulin Delivery Systems

If your child is using an automated insulin delivery system to manage their diabetes, your diabetes team may suggest limiting use of carbohydrate intake without insulin. In AID systems these carbs can raise blood sugar, causing the system to give more insulin.

Some children using an AID system have success with using a mode that temporarily increases the target sugar value (sometimes called exercise mode, activity mode, temporary target) to reduce the amount of insulin given.

Often these modes or settings need to be applied 30-60 minutes before starting the activity. They can be continued after activity to lower the risk of low blood sugars. Talk to your team about making a plan for your child.

Type of Activity	Examples	Sugar Level	Suggested Carb Intake (without insulin) *
Short duration/low intensity (can sing/talk)	<ul style="list-style-type: none"> • Walking • Leisure bike ride 	Under 100 mg/dL	15 grams carb
		Over 100 mg/dL	Extra carbs not needed
Moderate intensity	<ul style="list-style-type: none"> • Tennis • Golfing • Cycling • Jogging • Swimming 	Under 100 mg/dL	30 grams carb
		100-150 mg/dL	15 grams carb
		Over 150 mg/dL	Extra carbs not needed
Strenuous or high intensity (can't sing or talk) (High intensity sports may require additional 15 grams of carbohydrate every 45 min)	<ul style="list-style-type: none"> • Football • Hockey • Basketball • Strenuous swimming • Strenuous cycling • Shoveling snow 	Under 100 mg/dL	45 grams carb
		100-150 mg/dL	30 grams carb
		150-200 mg/dL	15 grams carb

*If using an AID System see information above under "Automated Insulin Delivery Systems" and speak with your care team before using carbs without insulin before activity.

Your health care team may have given you this information as part of your care. If so, please use it and call if you have any questions. If this information was not given to you as part of your care, please check with your doctor. This is not medical advice. This is not to be used for diagnosis or treatment of any medical condition. Because each person's health needs are different, you should talk with your doctor or others on your health care team when using this information. If you have an emergency, please call 911. Copyright © 7/2023 University of Wisconsin Hospitals and Clinics Authority. All rights reserved. Produced by the Department of Nursing. HF#8039.