



## TEXAS TECH UNIVERSITY HEALTH SCIENCES CENTER

Department of Pediatric Endocrinology  
4800 Alberta Avenue  
El Paso, Texas 79905  
(915) 215-5700

### **Information for School Personnel about Diabetes Mellitus**

#### **GENERAL INFORMATION**

Diabetes is a condition in which the pancreas gland does not produce enough insulin. Insulin is a hormone that regulates blood glucose (sugar). As a result, the blood glucose level can be elevated. Most students have Type 1 diabetes and will require daily insulin administration. A balance between insulin, food intake, and exercise must be maintained to prevent blood glucose levels from being either too high or too low. Recurrent illness and requests to be excused from class should be discussed with the student, parents, and physician. Students may give their insulin via syringe, insulin pen or insulin pump.

#### **BLOOD GLUCOSE TESTING**

Blood glucose monitoring is required for most individuals with diabetes. This involves pricking a finger, placing a drop of blood on a test strip, timing and evaluating the results. This test procedure is usually performed at least 4-6 times daily. The information is then recorded and insulin doses adjusted by the student, depending on his/her age or the parents or the physician based on the results. The student may need to test his/her blood glucose before lunch and/or exercise, with snacks, during episodes of low blood glucose or when not feeling well. School health personnel should be familiar with basic blood glucose monitoring techniques. The blood glucose equipment should be available in the classroom so the student can test him/herself when he/she feels low.

#### **DIETARY MANAGEMENT**

Students with diabetes are instructed to match their diet with their insulin doses and are able to select their food from a school menu or bring their own lunch from home. This is true whether they use an insulin pump or injections. The following are some general guidelines:

1. The general dietary guidelines for children with diabetes are those recommended for all people; emphasis on vegetables, fruits, and whole grains, and low in sugar, fat, and cholesterol.
2. Adequate time should be provided for finishing meals and snacks.
3. All meals and snacks with carbohydrates should be covered with rapid acting insulin using the doctor's prescribed insulin to carb ratio.
4. Students who take rapid acting insulin before meals and snacks, such as Lispro (Humalog), Aspart (Novolog) or Glulisine (Apidra) MUST start to eat within 5-10 minutes after the insulin injection.
5. Whenever possible, insulin should be given prior to eating. Some students who do not consistently finish all of their meals may need to take rapid acting insulin right after their meals.
6. Additional food may be necessary before strenuous exercise or additional exercise.

## **EXERCISE AND SPORTS**

Students with diabetes should be encouraged to participate in physical education and other school sports. The major consideration should be the prevention and/or early detection and treatment of low blood glucoses.

1. Vigorous exercise should begin slowly and gradually increase in level of intensity.
2. Exercise should be encouraged to be a regular occurrence, preferably at a fixed time, since food and insulin dose must balance with exercise.
3. Ideally, the students should check their glucose level before exercise. If the glucose level is below 150, they should eat a small snack (without insulin).
4. Physical Education teachers/coaches should be familiar with the symptoms and treatment of low blood glucose (see below).
5. Students should NOT exercise if symptoms of low blood glucose are present.
6. Fast-acting carbohydrates (i.e. juice, glucose tablets, regular soda) should be readily available at all times in case low blood glucose symptoms occur. These carbohydrates should be available in the classroom and the student should also carry an emergency source of carbohydrates with him/her at all times.
7. If the blood glucose before exercise is above 300 mg/dl, they should check for ketones. If ketones are moderate to large, the student should not exercise (See hyperglycemia-page 3).
8. Contact the student's parent if after school activities extend into the dinner hour. Insulin injections may be required, followed by a substantial meal or snack. Parents and students need to plan ahead for such activities.

## **HYPOGLYCEMIA (Low Blood Glucose) <70mg/dl**

Hypoglycemia occurs when blood glucose falls below 70 mg/dl. Most students are aware of when their blood glucose is low. Sometimes it can occur with little warning.

**If the student is required to go to the nurse's office to test blood glucose when symptoms of low blood glucose are present, someone MUST accompany him/her to the nurse's office.**

Causes:                      Too much insulin in the body  
                                    Less food than usual  
                                    Unexpected or unusually vigorous activity  
                                    Larger insulin bolus than what was needed

Symptoms:                      Hunger                                      Headache  
                                    Sleepiness                                      Inability to concentrate  
                                    Daydreaming                                      Weakness  
                                    Irritability                                      Pale appearance  
                                    Slurred speech                                      Poor coordination  
                                    Sweating (clammy)                                      Shakiness/trembling  
                                    Personality changes                                      Dizziness  
                                    Other specific to student: \_\_\_\_\_

## Hypoglycemia (Low blood sugar):

1. **BG < 70 mg/dl and ABLE TO SWALLOW without difficulty:**
  - a) Give child **15 grams** of carbohydrates, i.e. 4 oz. of juice OR 3-4 glucose tabs OR 3 packs of Smarties candies or 15 skittles OR as a last resort 5 oz. of regular soda (any brand).
  - b) Allow child to rest for 10-15 minutes and retest blood glucose.
  - c) If glucose is **above 70 mg/dl**, allow child to proceed with school activities and provide a meal or snack in 30-60 minutes.
  - d) If symptoms persist or blood glucose remains below 70 mg/dl, repeat A & B.
  - e) If symptoms still persist, notify parent and keep child in clinic.
  
2. **BG < 50 mg/dl and ABLE TO SWALLOW without difficulty:**
  - f) Give child **30 grams** of carbohydrates, i.e. 8 oz. of juice OR 6-8 glucose tabs OR 6 packs of Smarties candies OR 30 skittles OR as a last resort 10 oz. of regular soda (any brand).
  - a) Follow b-e above.
  
3. **BG < 70 mg/dl and UNCONSCIOUS, SEIZING OR UNABLE TO SWALLOW:**
  - a) Activate emergency medical services (call 911)
  - b) If available, inject Glucagon as directed.
  - c) Place child on their side.
  - d) Notify parent and/or physician.

**\*\*If no meter is available to test blood sugar, and symptoms are present, treat anyway!**

**Hypoglycemia and an insulin pump:** The pump should be disconnected if unconscious or if seizures occur. Do not pull out the insertion set; just disconnect the catheter tubing from the insertion set. The basal rate may be stopped for 30 minutes to help the glucose numbers come up more quickly. This is done by setting the temporary basal rate at 0% for 30 minutes OR the pump can be disconnected. If the pump is disconnected it is **important to reconnect the pump once the glucose level is over 70 mg/dl.**

## **HYPERGLYCEMIA : High blood glucose >250 mg/dl**

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Causes:	Not enough insulin Too much food/miss-counted carbs Illness, infection, stress Decrease in usual activity
Additional causes if on a pump:	Dislodged infusion catheter * (most likely cause-check site) No insulin in pump cartridge Air in tubing Depleted insulin pump battery Pump malfunction
Symptoms:	Excessive thirst Frequent urination Fatigue Dehydration Breath with fruity odor Nausea/vomiting Stomach ache

1. **Hyperglycemia/illness: Blood Glucose >250mg/dl or ILLNESS (regardless of blood glucose) check urine or blood ketones.**

- a) If **ketones are trace or small**, encourage 1-2 glasses of water hourly until ketones are negative. Correct with bolus of rapid acting insulin, but not more frequently than every 2 hours.
- b) If **ketones are moderate or large**:
  - 1) Student should remain in school or with caregiver for monitoring.
  - 2) Notify parent if patient is not feeling well. If student remains in school, retest blood glucose and ketones every 2 hours or until ketones are negative.
  - 3) Notify physician if parents not available.
  - 4) Correct with bolus of rapid acting insulin.
  - 5) Give 1-2 glasses of water every hour.

2. **Hyperglycemia and on an insulin pump**, these additional guidelines may also be necessary. Because only short acting insulin is used in insulin pumps, if something happens to the delivery of insulin to the student, he/she can go into ketoacidosis (moderate to large ketones) relatively quickly.

- a) **BG > 250 mg/dl and ketones are trace or small**, (if insertion site is intact and not leaking insulin) a correction bolus via the pump needs to be given and the glucose needs to be rechecked in 2 hours.
- b) If after 2 hours the blood glucose is still >250 mg/dl, the student needs an additional correction bolus (based on current glucose level) **with a syringe or insulin pen (disconnect the pump)**.
- c) Notify parents, change insulin pump cartridge, tubing and infusion set.
- d) **BG >250 mg/dl and ketones are moderate or large**, give correction bolus **via syringe or insulin pen (not the pump)**
- e) Notify parents, change insulin pump cartridge, tubing and infusion set.
- f) If the parents cannot be contacted and the student is vomiting, breathing heavily or the breath smells like ketones (fruity odor) **call 911**.

3. **INSERTION SET DISLODGEEMENT (Insulin Pump)**

- a) If parents cannot be reached to reinsert the set or the student cannot reinsert the set, give correction bolus via syringe every 3 hours until the set is replaced.
- b) Child will also need additional insulin via syringe or insulin pen to cover meals and snacks.

4. **SUPPLIES NEEDED AT SCHOOL**

- a) Glucose meter and strips
- b) Alcohol pads
- c) Insulin pen, cartridges and pen needles
- d) Insulin log sheet
- e) Glucagon emergency kit (hypoglycemia)
- f) 15 gm hypoglycemia treatment options (juice boxes, glucose tabs)
- g) Pump supplies- extra batteries, reservoirs and infusion sets
- h) Vial of insulin and syringe OR Insulin pen (back up for pump malfunction)

If you have any questions or concerns please do not hesitate to call The Texas Tech Pediatric Endocrinology Clinic at **(915) 215-5700**.