

# School Guidelines for a Student with Diabetes on Basal/Bolus Insulin Injection Therapy

Student Name: \_\_\_\_\_ Date of Birth: \_\_\_\_\_ Grade: \_\_\_\_\_ School Year: \_\_\_\_\_

## Blood Glucose (BG) Testing

- Test the BG prior to eating food that contains carbohydrates.
- Test the BG if the student has signs/symptoms of a high or low BG.
- Test the BG if the child is ill.
- Additional BG testing may be needed before and during periods of driving, physical activity, bus rides, and academic test taking.

## Urine Ketone Testing

- Test the urine for ketones if the BG is greater than 300 mg/dL.
- Test the urine for ketones if the child is ill, regardless of the child's BG.
- Follow the instructions on the ketone strip container that specifies the timing of the test and how to interpret the results.
  - If a new ketone strip bottle is opened, write the opening date on the bottle.
    - Check the expiration date before testing for ketones. Ketone strips expire after 6 months after opening the bottle.
- Even with positive ketones, **the child can remain at school** (Please see our **Diabetes: When a Child Should Stay Home from School** helping hand)
- See *Management of High Blood Glucose (Hyperglycemia)* section of this guideline for interpretation of ketones.

## Insulin Administration

- **Parent(s) are responsible for communicating the correct dose of insulin and any changes in the dose of insulin.**
- Store unopened insulin in the refrigerator (36-46° F). After the insulin vial is opened, it can be refrigerated or kept at room temperature and should be discarded after 28 days.
- Administer rapid-acting insulin lispro (Humalog®), aspart (Novolog®), or glulisine (Apidra®) by an insulin syringe or pen within 15 minutes before eating.
  - If the child is an unpredictable eater, give the insulin injection immediately after eating (with a 30 minute limit for eating) per request of the patient.
- The insulin dose is determined by calculating the carbohydrate (carb) bolus and the correction bolus for high blood sugar prior to eating.

<b>To calculate a carb bolus:</b> 1. Add up the total grams of carbs to be eaten 2. Divide the total number of carb grams by the carb ratio	<b>To calculate correction bolus for BG above target**:</b> 1. Subtract the target BG from the current BG 2. Divide by the correction factor	<b>To calculate the total bolus dose of insulin to be given:</b> 1. Add the carb bolus and correction bolus (if applicable)
<b>EXAMPLE:</b> Total carbs are 87 grams. The carb ratio is 1 unit per 12 grams of carbs. $87 \div 12 = 7.3$ units of insulin	<b>EXAMPLE:</b> Current BG is 257 mg/dL. Target BG is 140 mg/dL. Correction factor is 1 unit of insulin for every 50 mg/dL above target BG. $257 - 140 = 117$ $117 \div 50 = 2.3$ units of insulin	<b>EXAMPLE:</b> $7.3$ units (carb bolus) + $2.3$ units (correction bolus) = $9.6$ total units

\*\*DO NOT give correction bolus if less than three hours since last bolus insulin dose OR less than one hour since vigorous exercise OR if low BG occurred in previous three hours.

Rounding off to the nearest 1/2 unit	Rounding off to the nearest whole unit
0.1-0.3 round down to whole unit	0.1-0.4 round down to whole unit
0.4-0.7 round to 1/2 unit	0.5-0.9 round up to whole unit
0.8-0.9 round up to whole unit	



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*When your child needs a hospital, everything matters.™*

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## Management of High Blood Glucose (Hyperglycemia)

### High BG with Negative to Trace Ketones:

- A correction bolus is needed if the BG is above the target BG and it has been at least three hours since the last dose of rapid-acting insulin.
- Note: \*\* DO NOT give correction bolus if less than three hours since last insulin dose OR less than one hour since vigorous exercise OR if low BG occurred in previous three hours.
- The child should be encouraged to drink water or carb-free/caffeine-free liquids.
- Monitor the BG and urine ketones every three hours until ketones are negative and BG is between 70- 300 mg/dl.

### High BG with Small, Moderate or Large Urine Ketones:

- Parents should be notified immediately; if unable to reach the parent(s), contact Nationwide Children's Hospital- Endocrinology at (614) 722-4425, if the parent has signed a school release and/or HIPAA release.
- Even with positive ketones, the child can remain at school if clinically well (i.e. not vomiting, able to concentrate in class)
- Additional insulin for ketones may be needed; give as directed by the parent or a Nationwide Children's Hospital- Endocrinology provider.
- A correction bolus is needed if the BG is above the target BG and it had been at least three hours since the last dose of rapid-acting insulin.
- The child should refrain from physical activity until ketones are negative and feeling well.
- The child should be encouraged to drink water or carb-free liquids.
- Monitor the BG and ketones every three hours if the child remains at school until ketones are negative.
- The child may require hospital treatment if one or more of the following signs of diabetic ketoacidosis (DKA) are present: rapid breathing, rapid heart rate, fruity breath, capillary refill greater than three seconds, altered consciousness, prolonged vomiting and/or abdominal pain.

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Student Name: \_\_\_\_\_ Date of Birth: \_\_\_\_\_ Grade: \_\_\_\_\_ School Year: \_\_\_\_\_

## Management of Low Blood Glucose (Hypoglycemia)

- Never send a child with a suspected low BG anywhere alone.
- Symptoms of low BG:
  - Shakiness
  - Nervousness
  - Weakness
  - Pale Skin
  - Sweating
  - Personality Change
  - Confusion
  - Blurry Vision
  - Stomach Ache
  - Irritability/Crankiness
- If the BG is less than 70 mg/dl and the child can safely consume food/drink, give 15 grams of fast-acting carbs (4 oz. juice, 3-4 glucose tablets).
- Retest BG 15 minutes after the initial treatment of a low BG.
  - o If child is still low, give an additional 15 grams of carbs until BG is greater than the above 70 mg/dl.
- If the low BG occurs at meal or snack time, treat the low BG as above until BG is above 70 mg/dl and then give the usual insulin dose at meal time to cover the carbohydrates for the meal
- If unable to test BG, but the child does have symptoms of low BG, treat as noted above.
- Contact parent(s) if the child required two or more carb treatments in one day for a low BG or if the BG was less than 50 mg/dl.

**Emergency Treatment:** If the child has symptoms of a low BG and is unable or refuses to eat or drink, is unconscious, or is having a seizure, follow the following steps:

- Glucagon: Have trained personnel mix and administer glucagon 1 mg IM or SQ. The dose is 0.5 mg if the child is less than 45 pounds.
- Turn child on his/her side in case of nausea or vomiting.
- Call 911
- Stay with the child until emergency help arrives. Have someone contact parent(s) or guardian.
- When the child awakens and can swallow, encourage the child to take small sips of a carb-containing fluid (fruit juice or regular pop). If tolerated, follow with 15 grams of a carb and protein-containing food (such as peanut butter and crackers). Check blood glucose every 15 minutes and repeat snacks until BG is above 100 mg/dl.

**Following Up:** Preventing another low blood sugar

- If the child's next meal is more than an hour away, give the child another 15g snack without insulin to keep blood sugar on track.
- Choose a snack that has carbohydrates, protein, and fat to keep a steady blood sugar. Potential snacks include:
  - o 4 crackers with cheese or 4 crackers with peanut butter
  - o 8oz glass of milk
  - o Half of a lunch meat sandwich
  - o Granola bar



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## Management of Physical Activity

To maintain safe BG levels for activity/exercise, the student may need to take extra grams of carbohydrates before, during, and after physical activity.

### Physical Activity Guidelines for Students with Diabetes

- If urine ketones are present, the child should not participate in physical activities. See *Management of High Blood Glucose (Hyperglycemia)* section of this guideline.
- Physical activity usually lowers BG. The drop in BG may be immediate or delayed as much as 12-24 hours.
- If BG is <100 mg/dl prior to physical activity, give 15 gram complex carb snack without insulin. If <70 mg/dl, treat low using 15/15 rule, follow up with a complex carb snack.
- Check BG with every 30 minutes of activity.
- Do NOT give a high BG correction bolus within ONE hour of vigorous or prolonged activity.
- Give 15 grams of complex carb (protein and carb) if the patient is exercising and BG < 100 (without insulin coverage) or as directed by the parent. This amount may need to be adjusted later after seeing the effect on BG.

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