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ADJUSTING GUIDELINES FOR ACTIVITY

Physical activity can have a huge impact on blood sugar, and so it is important to have some guidelines to help minimize these fluctuations in blood sugar. Physical activity doesn't just refer to playing or sports activities, but also includes things like walking, doing chores and shopping at the mall. Activity can increase the body's sensitivity to insulin and the speed at which insulin is absorbed. Increased activity can cause low blood sugars, which may occur during the activity or be delayed for up to 24 hours afterwards. The effects of activity vary from person to person, and so it is important to know how your body reacts to different activities. Some people even notice that their blood sugar rises during vigorous exercise or competitive sports like football or hockey.

General Guidelines:

- When starting any activity for the first time, it is advisable to check your blood sugar before, during and after the activity. Once you have determined the best way to manage your insulin or food intake, the blood sugar can be checked less often.
- If your blood sugar is over 15 mmol/L, you need to check for ketones. If ketones are present, exercise is not recommended as it may lead to higher blood sugars and more ketones.
- It is important to note that whether you choose to eat extra food or decrease the insulin dose for an activity, you still must always carry extra food and supplies to treat low blood sugars.

Adjusting Food for Activity:

For activity of **short** duration, one of the easiest ways to manage exercise is to eat extra food. Generally, for every hour of moderate to strenuous activity, you need to eat an **extra** starch, plus a protein or fat, such as cheese and crackers. For longer activities, you may find that an energy bar (e.g. a PowerBar®) works better. Your pre-exercise blood sugar and the intensity and length of an activity are all important considerations when making decisions about food. For example: if your blood sugar is 4.5 mmol/L, and you plan to swim for 2 hours, you may need a faster source of glucose (e.g. some juice or a fruit leather), as well as cheese and crackers.

Adjusting Insulin for Activity:

To decrease the insulin dose for activity, you need to determine *which insulin is having the most effect at the time of the activity or expected low blood sugar.* See our handout *Basic Insulin*

Action. You can then decrease the dose of that insulin. For activities lasting most of the day, you will probably need to decrease more than one type of insulin.

- 20% decrease for moderate activity
- 30–40% decrease for strenuous or prolonged activity

If strenuous activity is planned within 2 hours of injecting rapid-acting insulin (Humalog®, NovoRapid® or Apidra®), the dose may need to be decreased by as much as 50%. This will prevent low blood sugars during the insulin's peak action time.

For children who are very active on certain days, but inactive on other days, it may be useful to have 2 sets of usual insulin doses, one for the active days and the other for the less-active days.

Examples:

The following scenarios are a few examples of how food and insulin can be altered to help prevent activity-related hypoglycemia.

Tammy is 10 years old and normally not very active after school. However, her friends call and ask her to go swimming for an hour before dinner. Her mother decides to give her an extra starch with her afternoon snack to prevent Tammy from going low. As well, Tammy promises to check her blood sugar after she's been swimming for 30 minutes to make sure she doesn't need another snack before dinner.

Raj is 8 years old and plays soccer three times a week after supper. His usual dose of insulin is:

Morning: 16 NPH, 8 NovoRapid Supper: 7 NPH, 4 NovoRapid

Because Raj's soccer starts at 6 PM, and his rapid-acting insulin will be peaking during the game, his parents decide to cut down his supper rapid-acting insulin dose by 50%. His new dose for soccer would be:

Morning: 16 NPH, 8 NovoRapid Supper: 7 NPH, 2 NovoRapid

Pete is 15 years old, and he is planning to go snowboarding all day with his buddies at the local mountain. He is on multiple dose injections. His usual insulin doses are:

Meals: 1 unit Apidra for every 10 g carbs Bedtime: 40 Lantus

Because Pete will be boarding all until dinnertime, he and his parents decide to lower his pre-breakfast and pre-lunch insulin by about 33%, since he will be quite active. Pete remembers that the last time he went boarding, he also went low during the night from all the extra activity. He and his parents therefore decide to decrease his bedtime basal insulin by 10% as well. His new doses will be:

Meals: 1 unit Apidra for every 15 g carbs Bedtime: 36 Lantus

Jessica is 3 years old, and she goes to swimming lessons on Tuesday and Thursday afternoons from 3:00 to 3:30 PM. Her usual insulin doses are:

Morning: 7 NPH, 3 Humalog Supper: 2 NPH, 1 Humalog

Because the morning NPH is the insulin that is having the most effect at the time of Jessica's afternoon swimming lesson, her Mom decides to decrease her insulin dose by about 20%. Her new dose for swimming days is:

Morning: 5½ NPH, 3 Humalog Supper: 2 NPH, 1 Humalog

Jessica's mother could also keep her insulin dose the same, but give Jessica a bit more starch and protein at her afternoon snack. This would also help prevent Jessica from going low after her swimming lesson.

William is on a pump, and he's going mountain biking. By experience, he knows that he tends to run low while he's biking with his pump on, and for about the next 3–4 hours. Through trial and error, he has found that by drinking about 8 ounces (250 mL, or 14 g carbs) of Gatorade from his water bottle every 30 minutes without bolusing **AND** setting a temporary basal rate of 50% on his pump, he can keep his blood sugars in his target range. He's also found that he needs to keep his temporary basal rate running for another 3 hours after he's finished cycling, to prevent post-exercise lows.

After a few personal experiences with different activities, you will be able to judge how much of a decrease in insulin dose or an increase in food is necessary for a given amount of activity. You may also find that a combined approach of less insulin and more food may be what works best for you.