

Carbohydrate and Insulin Adjustments: A Guide for Extra Activity and Diabetes on MDI Insulin

Guidelines for CHO Intake Before and During Exercise		
Exercise	BG Level	+ CHO/Time
Low intensity/ short duration (30 minutes) (ie light housework)	< 5.6 mmol > 5.6 mmol	10-15 g Not required
Moderate intensity/ moderate duration (30-60 minutes) (ie walking, shopping, moderate cycling, cutting lawn)	< 5.6mmol 5.6 -9.9 mmol 10 - 13.9 mmol	15 g before + 15-30g during 10-30 g Not required during but may need later
Moderate intensity/ long duration (ie football, hockey, basketball, strenuous cycling)(1 hour +)	< 5.6 mmol 5.6-10 mmol 10-13.9 mmol	30-45 g (part as mixed low fat snack before) 30 -45 g per hour divided into 10 -15g every 20-30 min 15 g per hour
High Intensity – short bursts of intense activity, usually can't be maintained more than 1 hour (ie competitive hockey, competitive rowing)	< 5.6 mmol 5.6-10 mmol 10-13.9 mmol	50 g (part as mixed low fat snack before) 45 g per hour divided into 15g every 20-30 min 15 g per hour

***Do not exercise if blood sugar is >14 mmol with ketones or over 16.7 mmol**

Hyperglycemia and Exercise

- Hyperglycemia following cessation of high intensity exercise can be due to insulin deficiency or due to a stress response (ie. a new activity)
- Too much insulin during activity may cause hypoglycemia and can prevent the body from burning fat efficiently. Delayed hypoglycemia following moderate or strenuous activity is common. This usually occurs 6-15 hours following the activity and can be responsible for hypoglycemia 24 or more hours later.

Guidelines for Insulin Adjustment for Extra Activity

1. Meal (bolus) Insulin Adjustment (Regular, Humalog, Novo-rapid)

Adjust the insulin acting during exercise using these guidelines		
Percent to decrease fast/rapid meal insulin	Intensity of activity/exercise	Duration of activity/exercise
0%	Low, moderate, or high	Short
5%	Low	Intermediate to long
10%	Moderate	Intermediate
20%	Moderate	Long
20%	High	Intermediate
30-50%	High	Long

As you become more trained in a particular sport, you may require a greater reduction of insulin – for example a trained athlete doing a high intensity sport for a long time may need an 80% reduction versus 30 – 50%.

2. Extended long-acting and intermediate-acting basal insulin (Lantus, Levemir, N, NPH)

Activity lasting greater than 90 minutes

- For longer duration activities basal insulin adjustments may also be necessary
- Evening insulin needs to be adjusted to prevent late onset hypoglycemia or may be adjusted if the activity is planned for very early in the morning
 - When starting a new activity, reduce basal insulin by no more than 50%
 - Typically evening reductions are 10-30% of the usual dose
- If on morning basal insulin, adjustment may be needed for morning and afternoon activities (long bike ride or cross country skiing)
 - A reduction of 30-50% is a good starting place