جامعة الإمام عبدالرحمن بن فيصل
IMAM ABDULRAHMAN BIN FAISAL UNIVERSITY

مستشفى الملك فهد الجامعي
King Fahad Hospital The University

# The treatment plan for diabetes during exercise and physical exertion

## What are the benefits for a diabetic child?

It is important for a diabetic child to exercise, as it brings him many benefits, including:


- ✓ Improve the ability to control blood sugar
- ✓ Exercise helps control weight, which reduces the risk of cardiovascular disease
- ✓ Improved sense of health.

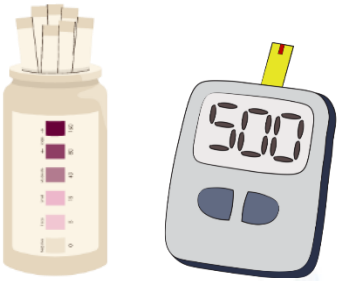
Sports include these types of activities:

- ✓ Moderate to vigorous aerobic activity.
- ✓ Muscle strengthening exercises.
- ✓ Bone strengthening activities.

## What are the contraindications to exercise?

**Although exercise help control blood sugar and improve physical health, it is forbidden to exercise in these cases:**

1. When blood sugar is high, to avoid acidity.
2. When you are in the honeymoon stage, which often occurs at the beginning of the diagnosis.
3. When the week's readings contain significant dips.



## What are the precautions used when exercising?

- **Blood sugar monitoring:**

  ✓ Glucose measurements should be taken before, during and after exercise with attention to the direction of change in blood sugar.

  ✓ Your blood sugar reading should be between 150 mg/dL to 180 mg/dL before exercising.

- **High blood sugar (hyperglycemia):**

  ✓ High blood sugar may occur during intense exercise, but also generally sugar rises after eating excessive carbohydrates or reducing or forgetting some doses of insulin.

## What are the precautions used when exercising?

- **High blood sugar (hyperglycemia):**

  ✓ During sports tournaments, stress and tension may trigger the release of some hormones that also lead to high blood sugar, if this situation occurs, use a corrective dose.

- **Low blood sugar (hypoglycemia):**

  - Hypoglycemia is an important consideration when planning exercise with diabetes.
  - Hypoglycemia can occur during or immediately after exercise or after a long period and also during sleep.

## What are the adjustments in insulin doses prior to exercise?

| Type of exercise | Pre-workout meal | | Post-workout meal |
|---|---|---|---|
| | The duration of the exercise is 30-45 minutes | The duration of the exercise is more than 45 minutes | |
| Moderate to vigorous aerobic activities such as swimming, running and football. | 25%-50% reduction in the dose of rapid-acting insulin (meal insulin) | 50%-75% reduce the dose of rapid-acting insulin (meal insulin) | 50% reduction in the dose of rapid-acting insulin (meal insulin) |
| Aerobic exercises with anaerobic exercises such as basketball, weight-bearing exercises, pull-ups and squats. | 25% reduction in the dose of rapid-acting insulin (meal insulin) | 50% reduction in the dose of rapid-acting insulin (meal insulin) | 50% reduction in the dose of rapid-acting insulin (meal insulin) |

- ✓ Reduce the dose of long-acting basal insulin the night before the day of physical activity by 20% from the usual dose.

## What are the tips to avoid a drop in blood sugar during exercise?

- ✓ Measure your blood sugar before you start exercising.
- ✓ Don't forget to bring a glucagon needle.
- ✓ Always bring some snacks that contain carbohydrates.
- ✓ Gradually increase the intensity and/or duration of exercise.
- ✓ In the few hours before your workout, eat slowly absorbed or complex carbohydrates.
- ✓ In the event of unexpected physical activity, reduce the dose of insulin during and after intense muscle activity.

## What are the tips to avoid a drop in blood sugar during exercise?

- ✓ Do not inject insulin in a place that will have a large role in muscle activity.
- ✓ When physical activity is planned at the time of peak insulin action, a significant reduction in the insulin dose must be made.
- ✓ Measure your blood sugar before bed in the evening after vigorous physical activity and be sure to add extra carbohydrates and/or reduce your long-acting (basal) dose to reduce the risk of hypoglycemia during sleep.
- ✓ Measure your blood sugar after each change in insulin dose.

## What are the procedures followed when examining ketones?

| Glucose in blood<br>Ketones in blood | Blood sugar higher than 250 mg/dL | Blood sugar less than 250 mg/dL | What to do? |
|---|---|---|---|
| Blood ketones greater than 1.5 mmol/L | Give ½ a correction dose of short-acting insulin | Add carbohydrates + give ½ correction dose of short-acting insulin | Avoid exercising! |
| Blood ketones 1.1 - 1.4 mmol/L | Give ½ a correction dose of short-acting insulin | Add carbohydrates + give ½ correction dose of short-acting insulin | Wait 60 minutes after the correction and make sure the blood sugar value is low and then you can exercise |
| Blood ketones 0.6 - 1.0 mmol/L | Give ½ a correction dose of short-acting insulin | Add carbohydrates + give ½ correction dose of short-acting insulin | Wait for 15 minutes after the correction and make sure the blood sugar value is low and then you can exercise |

## What are the procedures followed when examining ketones?

**You can exercise if your blood ketones are less than 0.6 mmol/L and there are no symptoms of ketoacidosis and a blood sugar reading between 150-180 mg/dL.**

## Sources and references:

The primary diabetes type 1 educational booklet. Dr. Rana albalwi, Ibtihal almuntasheri.

All Picture used are from canva.

## Audit and review:

The content of this booklet has been reviewed by pediatrics endocrine and diabetes consultants at King Fahad Hospital of the University.

# Pediatrics Department - Endocrine and Diabetes

## Health awareness Unit

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