Exercise & Diabetes

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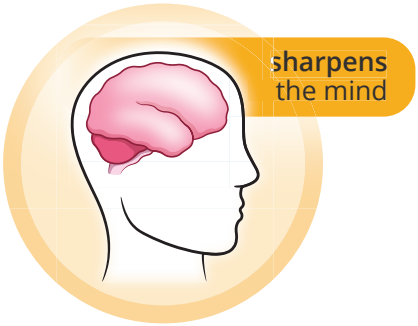
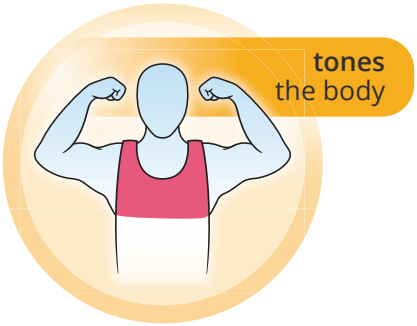
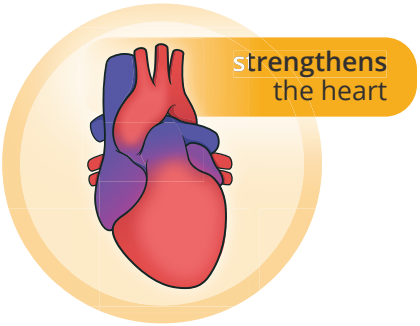
Effects of Exercise on Your Body and Glucose Levels[1]

Exercise is important for everyone's overall health. With diabetes, exercise is especially important because it:







Exercise can combat depression, improve well-being, minimize stress, and lower body fat and cholesterol levels.

When you exercise, glucose is your main source of fuel. This includes both **blood glucose (BG)**, as well as glucose that has been stored by your body.

In order for your muscles to use this glucose for fuel during exercise, your body needs to have **adequate levels of insulin.**

Too little insulin forces the body to break down fat for fuel, causing a buildup of ketones in the blood that can lead to diabetic ketoacidosis (DKA).

Too much insulin will cause blood sugars to drop, leading to hypoglycemia.

Not All Types of Exercise Are Created Equal

Different types of exercise can affect your blood glucose in different ways. It's important to know so you can plan accordingly.

Aerobic Exercise — BG ↓

Blood glucose tends to drop with aerobic exercise. Studies suggest reducing your basal insulin before prolonged aerobic exercise can help improve glucose control and reduce the risk of hypoglycemia.[2] **You may want to start a temp basal decrease of 50-80% about 1.5 hours before you exercise.**[2]

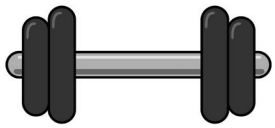
Examples: Cycling, Running, Swimming

Mixed Aerobic and Anaerobic Exercise — BG →

Blood glucose tends to stay more stable with these types of activities. You will want to monitor blood sugars frequently to avoid hypoglycemia or hyperglycemia. Depending on your blood glucose you may consider a snack or temporary change in basal rate if needed.

Examples: Basketball, Soccer, High Intensity Interval Training

Anaerobic Exercise — BG ↑



Blood glucose may spike during anaerobic exercise.[3] You may need to correct elevated blood glucose levels after anaerobic exercise or you may consider setting an increased temp basal on your pump prior to these activities.

Examples: Weight Training, Jumping

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Finding the right balance

Balancing activity with carbs and insulin can be challenging. Keeping track of what works for you can help you limit how often you experience a low blood glucose. Timing plays a big role in getting the right balance.[1]

Timing and Insulin Adjustments for Aerobic Exercise[1,3]

Planning Ahead for Better Control

You might benefit from adjusting your insulin as much as 90 minutes before you exercise. You may want to adjust both your pre-meal bolus and basal rate — especially if you are exercising in the evening.

For better control during exercise, consider[1]:

- How strenuous is the activity
- How long it will last
- The timing of the exercise relative to recent meals and boluses

Did you know?

Strenuous exercise can affect your BGs up to **36 to 48 hours** later.[1]

Activity Time	Adjustment
Within 2 hours of eating a meal	• Consider reducing your pre-meal bolus • Consider extra carbs
More than 2 hours after eating a meal	• Consider a temporary decrease in basal insulin

Exercise Tips[1]

- If available, use a CGM for current glucose readings and trends for accurate insulin and carbohydrate adjustments. Otherwise test your glucose often before, during and for 24-36 hours after exercise.
- The longer and more strenuous an activity, the more you need to decrease your bolus and basal doses to prevent hypoglycemia.
- Always carry fast acting carbohydrates, like glucose tablets, to rapidly correct hypoglycemia.
- Stay hydrated. Always have water, or a glucose containing beverage, or sport fluid available.

Always discuss your exercise plans with your healthcare provider before you start. Your healthcare provider can help you determine what adjustments are the best for you.

REFERENCES

1. Walsh J and R Roberts. (2016). Pumping Insulin (6th Ed.) San Diego, CA: Torrey Pinese Press

2. Zaharieva DP, McGaugh S, Pooni R, et al. Improved Open-Loop Glucose Control with Basal Insulin Reduction 90 Minutes Before Aerobic Exercise in Patients With Type 1 Diabetes on Continuous Subcutaneous Insulin Infusion. Diabetes Care 2019 May;42(5);824-831.

3. Ridell M, Gallen I, Smart C, et al. Exercise Management in Type 1 diabetes: a consensus statement. Lancet Diabetes Endocrinol 2017; 5:377-390.

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