

Physical activity and exercise

Key elements from the Canadian Diabetes Association 2013 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada

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Low physical fitness is as strong a risk factor for mortality as smoking.¹

The power to improve your patients' blood glucose control is in their hands...and feet!

Physical activity can be as powerful as glucose-lowering medication... with fewer side effects.²

The power of lifestyle... for the prevention and treatment of diabetes

Regular physical activity can:

- Improve fitness
- Increase vigour
- Improve blood glucose control
- Decrease insulin resistance
- Improve lipid profile and blood pressure
- Help maintain weight loss
- Reduce morbidity and mortality

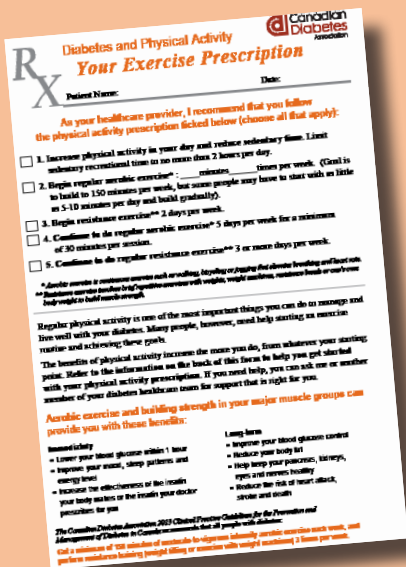
The Canadian Diabetes Association CPGs recommend a minimum of 150 minutes of moderate- to vigorous-intensity aerobic exercise each week, spread over at least 3 days of the week, with no more than 2 consecutive days without exercise. Most people living with diabetes currently do not meet these targets.

As a diabetes healthcare professional, you can substantially improve the adoption of regular physical activity (PA):

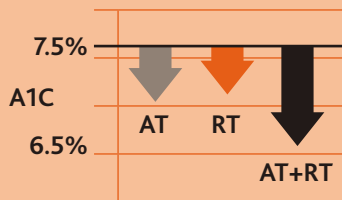
- Ask about PA at every diabetes-focused visit
- Advise inactive patients to get started. People with very low fitness levels can start with lower volumes and intensities of activity. For example, they could start with five minutes daily for a week, then 10 minutes daily (or 5 minutes twice a day) for a week, then 15 minutes a day, and so on, gradually working up to the 150-minutes-per-week goal over six or more weeks.
- Encourage and guide those who are active to maintain or progress further with their PA
- Help patients identify resources in the community

The Canadian Diabetes Association 2013 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada can be found at www.guidelines.diabetes.ca





Aerobic and resistance exercise significantly improves glycemic control (A1C) over 6 months.³



AT = Aerobic Training
RT = Resistance Training

Getting going – the 5 “A”s of PA promotion⁴

Assess: establish current PA level and readiness

Determine frequency, intensity, time and type of PA.

- Not active, not thinking about PA
- Not active, ready for PA
- Active and ready to maintain or progress

Advise: strongly encourage all patients to get more active

Review health risks, benefits of PA, appropriate amount and type of PA.

Agree: collaboratively develop goals and a personalized action plan

Provide individually relevant exercise prescriptions, time frames and monitoring strategies to meet the goals.

Assist: identify personal barriers and strategies to overcome barriers

Identify connections and resources for exercise and PA in the community.

- Regional Canadian Diabetes Association offices
- Canadian Society for Exercise Physiology (CSEP)
 - Find an exercise professional (www.csep.ca)
 - Canadian Physical Activity Guidelines
- Canadian Association of Cardiac Rehab
 - Find a local program (www.cacr.ca)
- Canadian Centre for Activity and Aging (www.ccaa-outreach.com)
- YMCAs and local fitness facilities
- Municipal / Community programs
- Canadian Kinesiology Alliance (www.cka.ca)

Arrange: specify plan for follow-up at diabetes focused visits with telephone calls or email reminders

Review PA level at subsequent visits and provide advice to achieve the next level of activity.

Successful PA counselling includes:

- Discussion of decisional balance (pros and cons), barriers, opportunities and supports
- Development of specific action plans and goals

Ready for PA?	Current Activity	Action Plan Examples
NO	None	<ul style="list-style-type: none"> • Discuss benefits of PA • Reduce sedentary time • Ask whether patient would consider walking for five minutes per day. Increase this amount over time
YES	Occasionally physically active	<ul style="list-style-type: none"> • Plan for regular PA • Add introductory resistance exercise
YES	Regularly active	<ul style="list-style-type: none"> • Progress aerobic exercise • Add advanced resistance exercise





Table 1. Aerobic exercise

Definition and recommended frequency	Intensity	Examples
Rhythmic, repeated and continuous movements of the same large muscle groups for at least 10 minutes at a time	Moderate: 50 – 70% of person's maximum heart rate	<ul style="list-style-type: none"> • Biking • Brisk walking • Continuous swimming • Dancing • Raking leaves • Water aerobics
Recommended for a minimum of 150 minutes per week (moderate intensity)	Vigorous: >70% of person's maximum heart rate	<ul style="list-style-type: none"> • Brisk walking up an incline • Jogging • Aerobics • Hockey • Basketball • Fast swimming • Fast dancing
Patients with very low fitness may need to begin with as little as five minutes per day and increase volume and intensity gradually over time		

Table 2. Resistance exercise

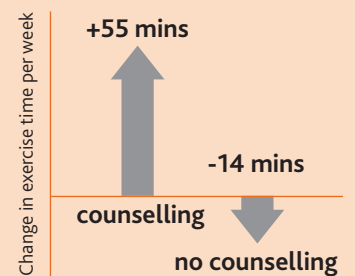
Definition	Recommended frequency and intensity	Examples
Activities that use muscular strength to move a weight or work against a resistant load*	3 times per week <ul style="list-style-type: none"> • Start with 1 set using a weight with which you can perform 15 to 20 repetitions while maintaining proper form • Progress to 2 sets and decrease the number of repetitions to 10–15 while increasing the weight slightly. If you cannot complete the required repetitions while maintaining proper form, reduce the weight • Progress to 3 sets of 8 repetitions performed using an increased weight, ensuring proper form is maintained 	<ul style="list-style-type: none"> • Exercise with weight machines • Exercise with free weights

*Initial instruction and periodic supervision are recommended

CPG chapters of interest

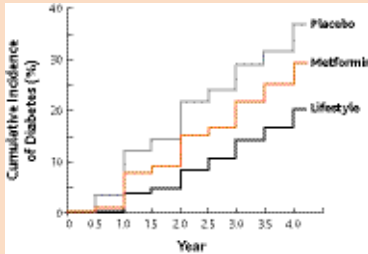
- Physical Activity and Diabetes
- Nutrition Therapy
- Management of Obesity in Diabetes
- Hypoglycemia
- Screening for the Presence of Coronary Artery Disease

Structured counselling by healthcare professionals effectively increases PA adoption.⁵



Physical activity and exercise is **safe** – cardiovascular complications occur in less than 1/100,000 hours of exercise.⁶

Lifestyle modification can reduce the risk of developing type 2 diabetes by up to 60%.



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Considerations before starting an exercise program

A physical activity program is generally safe and reduces health problems in persons with diabetes. Being inactive carries much more risk than being active.

Before establishing an exercise prescription for choice and intensity of exercises, pay attention to and talk to your patients about:

PRESENCE OF DIABETES COMPLICATIONS

- Severe autonomic neuropathy
 - Watch for dizziness or other evidence suggesting possible hypotension during or after exercise.
- Severe peripheral neuropathy
 - Be careful with prolonged weight-bearing exercise.
 - Check your patient's feet and review the importance of proper footwear.
- Proliferative retinopathy
 - Should be treated prior to starting resistance exercise.

CARDIOVASCULAR CONCERNS

Consider an exercise stress test for those:

- With symptoms suggestive of heart disease, such as dyspnea or chest discomfort.
- Previously sedentary individuals, at high risk for cardiovascular disease, who wish to undertake a vigorous exercise program.

MUSCULOSKELETAL ISSUES

- Back, hip and knee problems are common in people with diabetes.
 - Consulting with a musculoskeletal professional (e.g., physiotherapist, kinesiologist) may be helpful prior to starting an exercise program.

HYPOGLYCEMIA

- Discuss potential for hypoglycemia for patients taking insulin or oral medications (such as sulfonylureas) that may cause this.
 - Have patients self-monitor blood glucose before and after exercise for the first few sessions to look for hypoglycemia and to demonstrate effects of exercise on blood glucose levels.
 - Have your patient be prepared to treat hypoglycemia during exercise.

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References:

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3. Sigal RJ, Kenny GP, et al. Effects of aerobic training, resistance training, or both on glycemic control in type 2 diabetes: A randomized trial. *Ann Intern Med*. 2007; 147(6): 357-69.
4. The 5 "A"s adapted from: Estabrooks PA, Glasgow RE, Dziewaltowski DA. Physical activity promotion through primary care. *JAMA*. 289(22): 2913-6.
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Across the country, the Canadian Diabetes Association is leading the fight against diabetes by helping people with diabetes live healthy lives while we work to find a cure. Our community-based network of supporters help us provide education and services to people living with diabetes, advocate for our cause, break ground towards a cure and translate research into practical applications.

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Related articles: *Benefits of Physical Activity, Planning for Regular Physical Activity, Introductory Resistance Program, Maintaining Aerobic Exercise, Resistance Exercise Guidelines, Diabetes and Physical Activity: Your Exercise Prescription*

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