

Physical activity and exercise

Key elements from the *Canadian Diabetes Association 2008 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada*

Author: Paul Oh, MD MSc FRCPC

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:

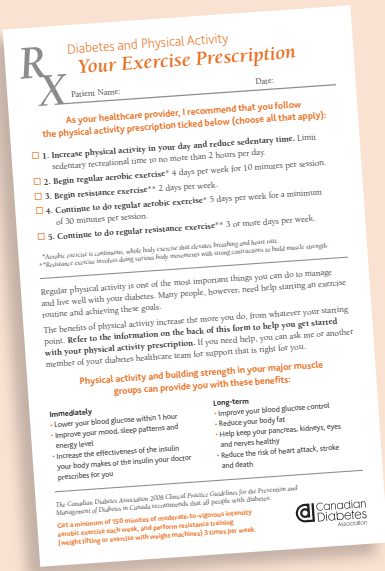
- Improve fitness
- Increase vigour
- Improve blood glucose control
- Decrease insulin resistance
- Improve lipid profile and blood pressure
- Help maintain weight loss
- Reduce morbidity and mortality

The Canadian Diabetes Association CPGs recommend 150 minutes of aerobic exercise and 3 sessions of resistance exercise per week. 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
- Use the new Canadian Diabetes Association Physical Activity and Exercise tools here diabetes.ca/physicalactivityprofessionals
- Advise inactive patients to get started
- Encourage and guide those who are active to maintain or progress further with their PA





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

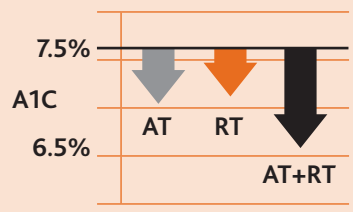
Identify connections and resources for exercise and PA in the community.

- 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-caa-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.

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



AT = Aerobic Training
RT = Resistance Training

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
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

Table 2. Resistance exercise

Definition and recommended frequency	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 of 10 – 15 repetitions at moderate weight • Progress to 2 sets of 10 – 15 repetitions • Progress to 3 sets of 8 repetitions at heavier weight 	<ul style="list-style-type: none"> • Exercise with weight machines • Weight lifting

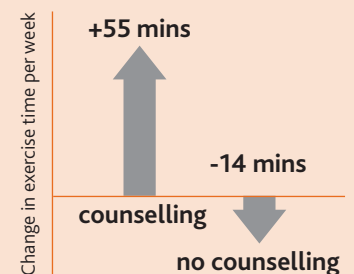
*Initial instruction and periodic supervision are recommended

CPG chapters of interest

- Physical Activity and Diabetes
- Nutrition Therapy
- Management of Obesity in Diabetes
- Hypoglycemia
- Identification of Individuals at High Risk of Coronary Events

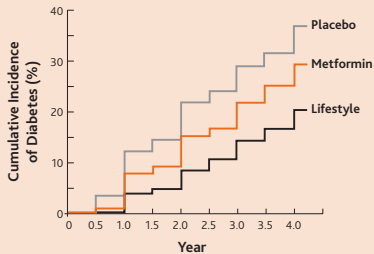


Structured counselling by healthcare professionals effectively increases PA adoption.⁵



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

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



*N Engl J Med*²

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.

Thank you to those who helped with content: Marni Armstrong, Ian Blumer, Normand Boulé, Jonathon Fowles, Tessa Laubscher, Ruth Lowndes, Tino Montopoli, Jonathan McGavock, Jeff Packer, Nel Peach, Mike Riddell, Mike Sarin, Brian Seeley, Chris Shields, Ron Sigal, Ernst Snyman, Guy Tremblay, Pearl Yang, Catherine Yu. CDA: Hayat Ali, Tracy Barnes, Carolyn Gall Casey.

References:

1. Church TS, Cheng YJ, et al. Exercise capacity and body composition as predictors of mortality among men with diabetes. *Diabetes Care*. 2004; 27(1): 83-88.
2. Knowler WC, Barrett-Connor E, et al. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med*. 2002; 346(6): 393-403.
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, Dzawaltowski DA. Physical activity promotion through primary care. *JAMA*. 289(22): 2913-6.
5. Kirk A, Mutrie N, et al. Effects of a 12-month physical activity counselling intervention on glycaemic control and on the status of cardiovascular risk factors in people with type 2 diabetes. *Diabetologia*. 2004; 47(5): 821-32.
6. American College of Sports Medicine; American Heart Association. Exercise and acute cardiovascular events: Placing the risks into perspective. *Med Sci Sports Exerc*. 2007; 39(5): 886-97.
7. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. *Can J Diabetes*. 2008; 32(suppl 1):S1-S201.

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. We are supported in our efforts by a community-based network of volunteers, members, employees, healthcare professionals, researchers and partners. By providing education and services, advocating on behalf of people with diabetes, supporting research and translating research into practical applications – we are delivering on our mission.

diabetes.ca | 1-800-BANTING (226-8464)

Canadian Diabetes Association