Physical activity in the prevention and management of type 2 diabetes


This fact sheet is designed to assist health professionals with the issue of physical activity for people with pre-diabetes and those with type 2 diabetes.

People with type 1 diabetes will benefit from being physically active and should be referred to an endocrinologist or exercise physiologist for assessment and advice.

Physical activity is one of the cornerstones of the prevention and management of type 2 diabetes in men and women. For people with pre-diabetes (impaired fasting glucose or impaired glucose tolerance) regular physical activity may delay or prevent the progression to diabetes. International studies have found that modest weight loss of 5-7% and moderate physical activity for at least 30 minutes each day (150 minutes per week) lowered the risk of developing diabetes by 58% in overweight people with pre-diabetes. In people with type 2 diabetes, physical activity can improve glycemic control, prevent cardiovascular disease and reduce the risk of cardiovascular and total mortality.

GPs who incorporate targeted brief intervention into their practices can effectively influence activity levels of patients at risk of diabetes as well as those with type 2 diabetes.

Physical activity for people with pre-diabetes

Benefits

Physical activity can help prevent or delay the onset of type 2 diabetes. It is particularly effective in the prevention of type 2 diabetes in people who are sedentary. Physical activity appears to be the strongest predictor in reducing the incidence of type 2 diabetes in the absence of any change in weight, blood pressure or cholesterol.

Preparation individuals with:

- Sedentary lifestyles or low activity levels
- Overweight or obesity (particularly abdominal obesity)
- Hypertension
- Hypercholesterolaemia
- History of gestational diabetes
- Polycystic ovary disease
- First-degree relative with diabetes
- Age 35 and over for some high-risk ethnic/cultural backgrounds (e.g. Pacific Islander, Chinese, Pakistani and Indian)
- Indigenous Australians
- Age 55 and over

Physical activity for people with type 2 diabetes

Benefits

- Cardiovascular-based physical activity appears to improve glycaemic control, independent of its effect on bodyweight, and may allow for a reduction in the dose of diabetes medication.
- A moderate or high level of physical activity has been shown to reduce the risk of total and cardiovascular mortality among patients with type 2 diabetes, independent of BMI, blood pressure, total cholesterol and smoking status.
- Resistance or strength training has also been shown to improve glycaemic control, reduce the required dose of diabetes medication and improve blood pressure control in people with type 2 diabetes.

Raising the issue of physical activity with patients who have pre-diabetes

- Identify people at high risk of developing type 2 diabetes.
- Provide verbal advice to increase physical activity.
- Reinforce the verbal advice with printed information.
- Set up a follow-up system and check progress at later consultations.
- Assess for development of diabetes by measuring fasting plasma glucose.
- Consider referral for advice, support or program development.

Preparing for physical activity

Before beginning regular physical activity, patients with pre-diabetes should undergo a thorough medical evaluation, including a detailed exercise history (baseline fitness, current physical activity and musculoskeletal status) and a cardiovascular assessment.

Examination of feet and eyes is also recommended. Physical activity recommendations for patients with pre-diabetes are outlined in Table 1.

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Preventing physical activity
Before beginning regular physical activity, patients with diabetes should have a detailed medical examination that includes their exercise history. Specialist referral and the support of other health professionals with specific training in physical activity and/or behaviour change may be required.

A coronary artery disease exercise testing protocol (graded exercise test), using a 12-lead ECG, should be performed on individuals with one or more of the following:

- Type 2 diabetes and aged over 35 years
- Type 2 diabetes and one or more additional cardiovascular risk factors
- Suspected or known coronary artery disease, including hypertension
- Microvascular or neurological diabetes complications, e.g. neuropathy, nephropathy, retinopathy.

Thoroughly assess the patient’s feet for signs of peripheral neuropathy or peripheral vascular disease: check for blisters, redness, numbness, sores, coldness, decreased or absent pulses, atrophy of subcutaneous tissues, mechanics of the foot and hair loss. Check the patient’s eyes before commencing a physical activity program. Physical activity recommendations for patients with diabetes are outlined in Table 1.

Patients who take insulin or oral hypoglycaemic agents
People who take insulin or oral hypoglycaemic agents to manage their type 2 diabetes need specific education and, where possible, referral to an exercise physiologist and a diabetes educator to develop a suitable physical activity program. Careful follow-up and adjustment of medications is needed to avoid hypoglycaemia and hypotension.

Patients should be advised to:

- Avoid strenuous exercise if glucose levels > 14 mmol/L.
- Consume additional carbohydrate foods (15 g of preferably low-GI carbohydrate) if blood glucose levels < 5.5 mmol/L immediately before planned moderate intensity exercise.
- Monitor blood glucose before and after exercise, and during prolonged exercise (> 30 minutes), to identify when changes in food intake or insulin are necessary (blood glucose levels may be affected for up to 48 hours post physical activity).
- Avoid giving an insulin injection into a limb that will be involved in the activity; exercise will increase insulin uptake.
- Be aware of their glycaemic response to different exercise conditions.
- Make sure carbohydrate-based foods are readily available during and after exercise.
- Consult an endocrinologist or diabetes educator about appropriate insulin adjustment as required.
- Arrange medication review once a regular exercise program is established.

Table 1. Physical activity recommendations for patients with pre-diabetes or diabetes

<table>
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<tr>
<th>Patients with pre-diabetes</th>
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<tbody>
<tr>
<td>Perform 30 minutes of moderate-intensity physical activity on most, preferably all, days of the week. This may be accumulated throughout the day. If weight loss is desired, patients should build up to 45-60 minutes of continuous exercise on most, preferably all, days of the week.</td>
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<td>Perform resistance training on at least 2-3 days/week.</td>
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<td>Reduce sedentary behaviours by being active in as many ways as possible throughout the day. Regard physical activity as an opportunity to improve health and well-being.</td>
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<td>See an exercise physiologist with experience in diabetes management for assistance with assessment, safe instruction and follow up.</td>
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People with complications or limitations to physical activity should be referred to a diabetes team, including an exercise physiologist. The Medicare Chronic Disease Management Items may be applicable to these patients.

References