

Metabolic Syndrome and exercise

Metabolic syndrome (MetSyn) is a cluster of related metabolic abnormalities and risk factors that considerably increase the risk of developing type 2 diabetes and cardiovascular problems. These include raised blood glucose (≥ 5.6 mmol/L), raised blood pressure ($\geq 130/85$ mmHg), dyslipidaemia (blood triglycerides ≥ 1.7 mmol/L and lowered high-density [HDL-c] cholesterol), and central obesity (increased fat deposits around the abdominal organs). The presence of 3 or 5 of these risk factors constitutes a diagnosis of MetSyn (1). About 19–29% of Australian adults have MetSyn (2).

How does exercise help?

MetSyn can usually be reversed with lifestyle changes. The combination of weight loss and exercise produces the best effect (3). Blood glucose levels, blood lipid levels and blood pressure all improve. The risk of progressing to type 2 diabetes also reduces by 29–68% (3–5). This improvement may exceed the benefits of current diabetes medications (3).

Focus on 'fitness' rather than 'fatness'. Although weight loss remains fundamental to the management of MetSyn, it is mistakenly thought of as the main reason for doing regular exercise. Several major lifestyle intervention trials show that exercise leads to significant reduction of risk factors even without weight reduction (3,5,6).

What exercise is best for people with MetSyn?

People with MetSyn can exercise safely if the exercise program begins slowly and progresses appropriately. An accredited exercise physiologist can prepare an exercise program for people with MetSyn, who may also have other medical conditions. The general recommendation for adults to participate in at least 30 minutes of aerobic exercise 'on most, if not all, days of the week' holds for people with MetSyn, because improvements in glucose levels and insulin effectiveness can be lost within 24–48 hours of last exercising. Aerobic exercises that use the large muscle groups (e.g. brisk walking, jogging, cycling, swimming, dancing, playing ball games or other sporting activities) are appropriate and effective (3–5).

For overweight and obese people, the recommended level of exercise can significantly:

- reduce waist measurement by 2–5 cm without weight loss (7);
- lower systolic and diastolic blood pressure (by approximately 5.5 mmHg each)
 - improve control of blood glucose levels;
- lower blood lipids (by 0.2 - 0.3 mmol/L, up to 1.39 mmol/L); and
- increase HDL-c (by 0.02 - 0.13 mmol/L, up to 0.20 mmol/L) (9,10).

While resistance exercise (weights training) can also benefit people with MetSyn, this type of exercise may not reduce central obesity. However, a combination of aerobic exercise and progressive resistance training reduces the risk of progressing to type 2 diabetes (3, 4). Use resistance exercise to complement, but not replace, aerobic exercise training.

Moderate intensity aerobic exercise is probably best for overall improvement in MetSyn (11) and may be more likely to be sustained than a program of vigorous exercise. A simple rule of thumb is to exercise at a level that increases your breathing and heart rate but still allows you to maintain a conversation. Do 5–10 minutes of warm-up exercises (light aerobic activities) before your exercise sessions. A resistance exercise program performed at least twice a week can improve insulin action, 'good' cholesterol and blood pressure. You need to do 2–3 sets of 8–10 different exercises, at a load that can be performed for 12–15 repetitions of each exercise. Correct exercise technique is essential to minimise the risk of injury.

References and further information

Exercise is Medicine Australia www.exerciseismedicine.org.au

Find an Accredited Exercise Physiologist www.essa.org.au

Exercise Right www.exerciseright.com.au

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For more detailed information, please read the full version of this factsheet at www.exerciseismedicine.org.au

