

## 10: PHYSICAL ACTIVITY AND OBESITY

**O**verweight and obesity are defined as 'abnormal or excessive fat accumulation that may impair health'.<sup>1</sup> Using Body Mass Index (weight (kg) / height<sup>2</sup> (m)) (BMI) overweight is classified as a BMI of 25-30 and obesity as >30.

Obesity is a major risk factor for many non-communicable diseases (NCD)<sup>1</sup> such as:

- Cardiovascular disease (mainly heart disease and stroke)
- Diabetes
- Musculoskeletal disease (mainly osteoarthritis)
- Some cancers (mainly colon and breast)<sup>2</sup>

Childhood obesity is associated with a higher chance of obesity, premature death<sup>2</sup> and disability in adulthood.<sup>1,2</sup> However, in addition to future risks,<sup>3</sup> childhood obesity is associated with considerable emotional and behavioural problems including in boys, conduct problems, hyperactivity and inattention problems, peer relationship problems, prosocial behaviours and total social difficulties.<sup>4</sup>

Weight loss in obesity has been associated with improvements in most cardiometabolic factors,<sup>5</sup> whilst significant weight loss (>5% of baseline weight) has been shown to be more effective in reducing cardiac and diabetic risk factors, and even death rates.<sup>6,7</sup>

**Weight gain:** An increase in weight is affected by the amount of energy expended versus the number of calories consumed.<sup>8</sup> If energy expended is low and dietary consumption excessive then weight gain will inevitably occur.

**Physical activity alone or with diet:** There is no strong evidence that physical activity of 150 minutes or less a week, on its own achieves any significant weight loss.<sup>9,10</sup> Without a dietary plan involving calorific restriction individuals will experience weight loss in a range of nil to no more than 2kg.<sup>10,11</sup> Exercise when combined with diet plans may result in a slight greater weight loss than diet alone<sup>10</sup> but the amounts are small and confirm that the majority of weight loss is to be gained from the calorific restriction.<sup>11</sup>

**Physical activity and increased intensity:** Significant weight loss can occur with aerobic exercise without calorific restriction, but it requires a high exercise volume of >225 minutes a week. For the majority, these levels may not be practical or achievable.<sup>12</sup>

**Physical activity and prevention of weight gain:** To prevent the shift from normal weight to overweight and obesity, it is recommended that levels of 150-250 min/week of moderate to vigorous physical activity are required.<sup>12</sup>

**Physical activity and weight maintenance:** After successful weight loss physical activity levels of 200-300 min/week should be maintained to avoid regaining weight.<sup>12</sup> NICE guidelines suggest even higher levels of 300-450 min/week.<sup>13</sup>

### Aerobic exercise or resistance training and weight loss:

Aerobic exercise is most beneficial by virtue of energy expenditure and health benefits of important risk factors.<sup>11</sup> There is little evidence that resistance training alone produces any significant weight loss.<sup>11</sup> However, resistance strength training has also been shown to maintain overall health, muscle strength (preventing sarcopenia), preserve bone strength<sup>14</sup> and reduce mortality in men.<sup>9,15</sup>

### The real health message of physical activity in obesity:

It is very important to stress that aerobic physical activity offers substantial health benefits even if weight loss is not achieved,<sup>10</sup> as patients often have unrealistic weight loss expectations.<sup>16</sup> However, weight loss is still recommended in obese patients to reduce the risk of NCD and premature death.<sup>5,6</sup>

Many trials of exercise therapy have reported little or no weight loss (<5kgs) but still have reported many health benefits including:<sup>10</sup>

- Improved vascular endothelial function<sup>17</sup>
- Lipoprotein particle size<sup>18</sup>
- Reduction in low density lipoprotein<sup>18</sup>
- Reduction in triglycerides<sup>10</sup>
- Improved cardiovascular fitness<sup>19</sup>
- Lower diastolic blood pressure<sup>10</sup>
- Improved glucose control
- Quality of life<sup>20,21</sup>

Exercise may produce impressive improvements in body composition, e.g. a 2kg increase in lean mass and 2.5kg decrease in fat mass but with an unimpressive change in total body weight which might discourage patients who are often primarily motivated by weight loss.

This is the **key concept** to get across to overweight patients, that they can reduce their disease potential if they are active, compared to an inactive individual of similar weight.

An example of this is a study of 58 sedentary and overweight men who undertook a supervised aerobic exercise programme for 12 weeks.<sup>22</sup> The mean reduction in weight was 3.63kg. However, 26 of the 58 failed to achieve predicted weight loss and only had a mean weight loss of 0.9kg. Other health parameters showed the following significant outcomes:

- Increased aerobic capacity (6-3 ml/kg/min, p<0.01)
- Decreased systolic blood pressure (-6 mm Hg, p<0.05)
- Decreased diastolic blood pressure (-3.9 mm Hg, p<0.01)
- Decreased waist circumference (-3.7 cm, p<0.01)
- Decreased resting pulse (-4.8 bpm, p<0.001)

In addition, these individuals experienced an increase in positive mood with the acute exercise.

Advice to obese individuals must be realistic as they are often unfit and have coexisting co-morbidities present. You need to be aware of the effort required to lose weight, what is a reasonable expectation of weight loss and of the stigma patients feel being labelled overweight or obese.<sup>23</sup>



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Small steps in gained activity through everyday changes should be encouraged and maintained even if more formal physical activity remains difficult. Guidance on managing the overweight and obese has been summarized in NICE guidelines and the areas relative to physical activity are listed below.

**NICE clinical guidelines CG189**<sup>13</sup> on managing overweight and obesity in adults recommends:

Encourage adults to increase their level of physical activity even if they do not lose weight as a result, because of the other health benefits it can bring (for example, reduced incidence of type 2 diabetes and cardiovascular disease).

Encourage adults to do at least 30 minutes of moderate or greater intensity physical activity on 5 or more days a week. The activity can be in 1 session or several lasting 10 minutes or more.

Advise that to prevent obesity most people have to do 45-60 minutes/day of moderate-intensity exercise particularly if they do not reduce their energy intake. Advise people who have been obese and lost weight that they may need to do 60-90 minutes/day of moderate-intensity physical activity to **avoid regaining weight** once lost.

Encourage adults to build up to the recommended activity levels for weight maintenance, using a managed approach with agreed goals. Recommend types of physical activity, including:

- Activities that can be incorporated into everyday life, such as brisk walking, gardening or cycling
- Supervised exercise programmes
- Other activities, such as swimming, aiming to walk a certain number of steps each day, or stair climbing

Take into account the person's current physical fitness and ability for all activities. Encourage people to also reduce the amount of time they spend inactive, such as watching television, using a computer or playing video games.

**NICE clinical guidelines CG189**<sup>13</sup> on managing overweight and obesity in children recommend:

Encourage children and young people to increase their level of physical activity, **even if they do not lose weight** because of the reduced risk of type 2 diabetes and cardiovascular disease.

**Encourage children to do at least 60 minutes of moderate or greater intensity physical activity each day.** Tips include:

- Can be split into several sessions
- Awareness that children already obese may need to do more than 60 min/day
- The activity can be in 1 session or several sessions lasting 10 minutes or more
- Encourage children to reduce inactive behaviours, such as sitting and watching television or playing video games
- Give children the opportunity and support to do more exercise in their daily lives
- Give children the opportunity and support to do more regular, structured physical activity
- Make the choice of activity with the child, and ensure it is appropriate to the child's ability and confidence

### Summary

- Aerobic physical activity offers substantial health benefits even if weight loss is not achieved
- No strong evidence that physical activity of 150 minutes a week, on its own, achieves any significant weight loss
- High levels of physical activity are required to lose weight without dietary change
- 45-60 minutes/day of moderate-intensity physical activity are required to prevent weight gain
- 60-90 minutes/day of moderate-intensity physical activity are needed to avoid regaining weight once lost
- Weight loss with physical activity is best when combined with dietary & behavioural interventions

Adults, who find it difficult to maintain their weight, should be encouraged to:

- Reduce energy intake
- Minimise sedentary behaviour
- Work on progressively increasing their physical activity, initially up to and then past 30 minutes and up to 60 minutes a day or more.



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## Key message:

Exercise is a crucial part of any treatment plan for a patient with obesity. It can increase their well-being and quality of life, lead to fewer complications in future including cancers, diabetes and musculoskeletal problems and increase the potential to lose weight and maintain the weight loss.

## Consider:

1. Auditing your obese patients to see if they have been offered an exercise referral scheme and dietary programme.
2. Auditing and monitoring your obese patients to determine their present activity levels.
3. Signposting them to local services that can support them in increasing their activity levels e.g. local walking groups, leisure centres etc

## Benefits to health professionals:

Reduced admissions, drug costs, appointments and visits.

## Further resources:

- **Public Health England Obesity website**  
A single point site for information on data, evaluation, evidence and research related to weight status and its determinants.
- **Swedish Public Health guidance on exercise and obesity:**  
<http://www.fysss.se/wp-content/uploads/2018/01/36.-Obesity.pdf>
- **The Royal College of General Practitioners 2015 Nutritional Position Statement** supports the use of exercise as a weight loss intervention particularly when combined with dietary change and a behavioural component.

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