

# Exercise in the maintenance of weight loss: health benefits beyond lost weight on the scale

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## INTRODUCTION

A cavalier description of weight loss is that it only requires overweight people to eat less and move more. Such simplicity is, however, much harder to effect in the practice of obesity treatment.

Liraglutide is a drug used in obesity treatment that induces weight loss primarily through appetite suppression. Lundgren and colleagues used a 2×2 factorial design to examine the role of liraglutide and exercise in the maintenance of weight loss, employing control, exercise, liraglutide, and exercise plus liraglutide groups.<sup>1</sup> When compared with the control group, it was found that the combination group was better at maintaining healthy weight loss than either monotherapy. While the study was a landmark, we felt that Lundgren and colleagues underemphasised the importance of exercise during weight-loss maintenance and its impact on other measures of overall health. Simply focusing only on lost weight undermines the numerous health advantages of exercise, including better mental health, the composition of lost weight and, importantly, improved fitness.<sup>2</sup>

## BODY COMPOSITION

Bodyweight comprises two components: fat mass and fat-free mass (FFM), consisting of bone and lean soft-tissue mass.<sup>3</sup> Much of the obesity-related disease risk is associated with fat mass and, more specifically, visceral fat, which is an undesirable location to accrue body fat. However, most diet-only weight-loss strategies result in a loss of both fat and FFM. A reduction in FFM, especially skeletal muscle, can have negative metabolic consequences, including weight regain.<sup>4</sup> Thus, weight loss and maintenance should focus on changes in body composition and the loss of visceral fat and relative preservation of muscle mass. Compared with placebo, Lundgren *et al* showed that all active treatment groups were associated

with decreases in fat mass and waist circumference; nonetheless, decreases were twice as large in the exercise plus liraglutide group. The exercise group was the only treatment group that showed preserved lean mass when compared with placebo. Additionally, compared with baseline, the exercise group was the only active treatment with increases in lean mass, which may be important for long-term metabolic health and, potentially, to maintain lost weight.<sup>4</sup>

## CARDIOVASCULAR OUTCOMES

Poor cardiorespiratory fitness (CRF), often associated with obesity, is an independent risk factor for cardiovascular disease (CVD) and mortality.<sup>5</sup> Thus, people with obesity should be encouraged to increase their physical activity to enhance CRF as it can greatly reduce the adverse effects of excess fat mass and other traditional CVD

risk factors even in the absence of weight loss.<sup>6</sup> As expected, only the exercise and combination groups exhibited increased CRF.<sup>6</sup> In our view, improvements in CRF should be viewed as being virtually equivalent in importance to weight loss itself since increases in CRF are associated with lower rates of all-cause mortality and CVD.<sup>1</sup>

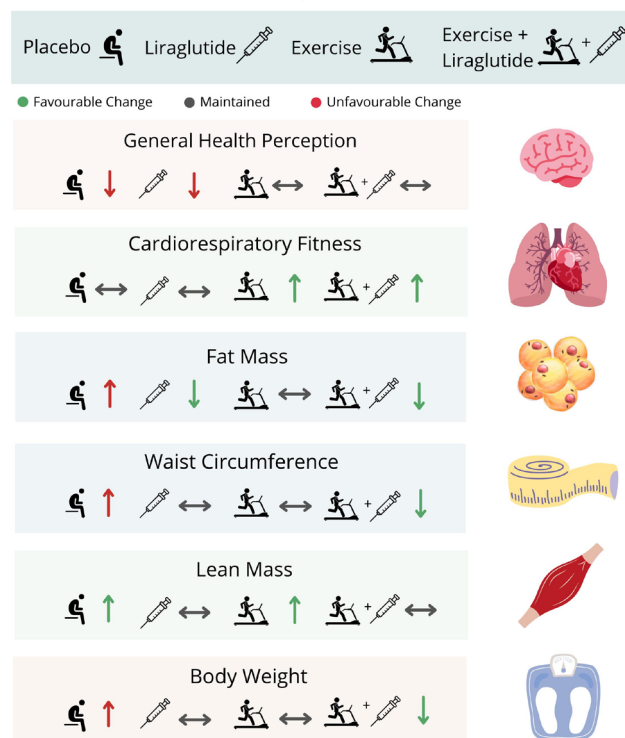
Resting heart rate (HR) is another risk factor for CVD and all-cause mortality.<sup>7</sup> This risk increases continuously with resting HR above 60 beats/min.<sup>7</sup> Unsurprisingly, treatment groups began the intervention with an average resting HR above 60 beats/min. Postintervention, the liraglutide group showed an increase in resting HR. This increase was not present in the combination group, likely due to exercise in the treatment strategy. Exercise is an effective way of reducing resting HR, lowering the risk of CVD and mortality.<sup>8</sup>

## PERCEPTION OF WELLNESS

Health encompasses more than just physical health measures. It includes self-perceived health status as well as physical and emotional well-being. Self-perception of poor health is an independent predictor of adverse health-related outcomes, including mortality. While all treatment

## Weight Loss Maintenance Strategies

in women and men after one year



**Figure 1** Infographic representation of the main findings from healthy weight loss maintenance with exercise, liraglutide or both combined by Lundgren *et al*.<sup>1</sup>

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groups successfully maintained their weight-loss postdiet, both the liraglutide and control groups experienced a significant decrease in general health perception; however, this was not observed in the exercise or combination groups, who showed improvements in their emotional well-being.

## CONCLUSION

Weight loss, but more importantly, the maintenance of weight loss, is a critical clinical outcome in obesity treatment. As evident by this study, there are various ways to maintain weight loss<sup>1</sup>; nonetheless, it is vital to consider how these strategies impact aspects of health beyond weight on a scale. Exercise is associated with improvements in physical and mental health. When exercise was combined with liraglutide, the composition of lost weight was beneficially affected; potentially undesirable effects of liraglutide were reduced; emotional well-being was improved; and, critically, CRF was enhanced. In our view, exercise plays a vital role in affecting the composition of lost weight, the maintenance of lost weight and other key health metrics. It is clear that, when combined with liraglutide treatment, exercise results in a more holistic state of health (see figure 1) that may result in improved longer-term health and may, we propose, enhance adherence to the treatment and promote longer-term weight-loss maintenance. The work of Lundgren *et al* should be celebrated. Nevertheless, our footnote would be that exercise in conjunction with

pharmaceutical interventions is vital to better health beyond lost weight on the scale.

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