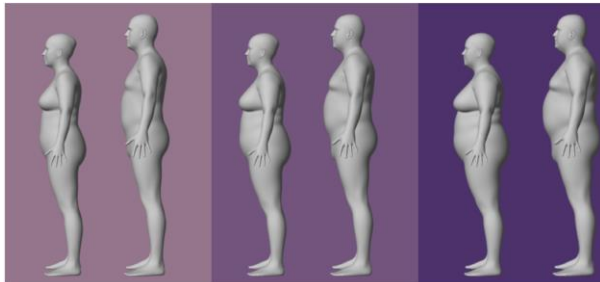


Obesity Treatments



BMI 30

BMI 35

BMI 40

A quarter of adults in the UK are clinically obese and therefore at an increased risk of developing chronic diseases. NHS advice is to eat fewer calories and take more exercise to lose weight. Increasingly, drug treatments and surgery are being considered as a means to lose weight for extremely obese people who have had difficulty in adhering to lifestyle changes. This briefing discusses the current methods used to manage and treat obesity.

Obesity

Obesity is where a person has an extreme excess of body fat to the extent that their health may be adversely affected. It is caused by an imbalance between energy consumed in the diet and energy used, which is influenced by genetic, cultural and environmental factors. Body mass index (BMI), calculated from a person's weight and height, is used as a reliable indicator of body fatness for most individuals (see Table 1). In the UK, two-thirds of adults are overweight or obese, a quarter are obese and 2.5% or 1.3 million people are morbidly obese (BMI 40+ kg/m²).² Among children, obesity prevalence doubles between reception and year 6 from 10% to 20%.³

Health Problems

Obesity can cause problems such as breathlessness, joint and back pain, tiredness and low self-esteem.⁴ It also increases the risk of developing many long-term conditions, including type 2 diabetes (see Box 1), stroke, cardiovascular disease, some types of cancer, infertility, liver disease and osteoarthritis.⁵ People of Asian, African or Caribbean descent are at a higher risk of developing conditions associated with obesity at a lower BMI than White Europeans.⁶ Moderate obesity (Table 1) reduces life expectancy by an average of three years, while morbid obesity reduces life expectancy by eight to ten years, equivalent to the effects of lifelong smoking.⁷

Overview

- Obesity increases the risk of developing a range of long-term health conditions. Treating conditions caused by excess weight costs the NHS ~£5 billion a year.¹
- The first line of treatment for obesity is weight loss through changes in behaviour, diet and physical activity. Many people do lose weight with this approach but find long-term weight loss difficult to maintain.
- The NHS also funds weight-loss surgery for obese patients who have failed to achieve or maintain weight loss.
- The Health Select Committee recently recommended population-wide interventions to improve diet and levels of physical activity to prevent people becoming obese.

Demographics of obesity

Obesity prevalence varies across age groups, peaking between 45 and 75 years.² Among women and children, obesity is more prevalent at higher levels of deprivation.^{8,3} This [interactive map](#) of childhood overweight and obesity displays data by region. For men, only occupation- and qualification-based measures of deprivation show variation in obesity by levels of deprivation. Obesity levels also vary across ethnic groups; for example obesity levels are highest among black African women and Bangladeshi women and are lowest among Chinese men and women.⁶ Obesity levels are also particularly high among people with disabilities⁹ (particularly learning disabilities¹⁰), victims of abuse¹¹ and people with mental health problems (partly because many psychiatric drugs cause weight gain).

Table 1. Body mass index (BMI) categories

Classification ¹²	BMI range (kg/m ²)
Normal	18.5 to <25
Overweight	25 to <30
Class I obesity (Moderate)	30 to <35
Class II obesity (Severe)	35 to <40
Class III obesity (Morbid)	40+

Box 1. Type 2 Diabetes

Type 2 diabetes is a metabolic disease where the body is unable to regulate blood sugar levels. Untreated or poorly managed, it can lead to widespread damage: complications include blindness, kidney disease and foot ulcers. Obesity greatly increases the risk of developing type 2 diabetes. Weight-loss can prevent diabetes in high-risk individuals¹³ and reverse diabetes in patients diagnosed within the last 10 years¹⁴. Key information on diabetes prevention was outlined in [POSTnote 415](#). It has been estimated that:

- type 2 diabetes accounts for 90% of diabetes cases
- approximately £10 billion per year (10% of the NHS budget) is spent treating diabetes and its complications¹⁵
- by 2035, diabetes may cost the NHS up to £20 billion per year¹⁵

Childhood obesity increases the likelihood of obesity and associated diseases in adulthood.¹⁶ Obese children go through puberty earlier¹⁷ and over the last 25 years children have started to develop type 2 diabetes¹⁸.

Management of Obesity

Many people try to lose weight without contacting their GP, through lifestyle changes, weight loss programmes and over-the-counter weight loss drugs (see Box 2). However, self-perception of weight is often inaccurate,¹⁹ and parents do not always recognise that their child is overweight or obese²⁰. Contact with GPs through primary care is one route for offering treatment services to obese patients.²¹ However, analysis of 300,000 NHS patient records found that for over three-quarters of obese patients, no weight-loss advice or intervention was recorded over a seven-year period.²² Possible reasons for this include GPs not having time to discuss obesity with patients, not believing that the treatments available are effective²³ and not receiving incentives to treat obesity²⁴.

The Intervention Pathway

Obesity care is split into four tiers²⁵ (see Figure 1). Tier 1 includes population-wide interventions largely focused on preventing obesity. These are discussed on page 4. Tiers 2-4 are discussed below.

- **Tier 2** is individual primary care intervention for those with a BMI over 25 kg/m². It includes advice from nurses and GPs and referral to a weight management programme. GPs can also prescribe weight-loss drugs (see Box 2).
- **Tier 3** is a more intensive weight management programme for obese (those over 40 kg/m² or over 35 kg/m² with diabetes) individuals who have not responded to other interventions. It is provided by a multidisciplinary team of specialists, typically including a specialist physician, specialist nurse, psychologist, dietitian and physiotherapist.²⁵
- **Tier 4** is weight-loss surgery for those over 40 kg/m² or over 35 kg/m² with diabetes.

Tier 2: Lifestyle Interventions**Physical Activity**

Exercise alone, without calorie restriction, does not result in weight loss for most individuals.²⁶ But, in combination with a reduced calorie intake, increased physical activity increases weight loss²⁷ and has other health benefits, as highlighted

Figure 1. The four tiers of obesity care

by a recent Health Select Committee [report](#).²⁸ It is particularly important for long-term weight management. However, there is uncertainty about whether exercise referral schemes are cost-effective.^{29,30} Depression and self-consciousness associated with obesity may prevent participation in sport or exercise programmes. Encouraging active travel (walking and cycling) may increase physical activity on a population-level.³¹

Dietary Advice

Calorie-restricted diets (deficit of ~600 calories per day) recommended by NICE result in moderate weight loss.³² Patients who completed a randomised clinical trial lost on average 3-5 kg over the two-year trial, whether on a low-fat, high-protein or low-carbohydrate diet.³³ The British Dietetic Association emphasises the need for dietary changes that can be maintained long-term for effective, long-lasting weight-loss with clinical benefits.³⁴ Very-low-calorie diets (see Box 3) may be used for short-term weight loss but only in certain circumstances.³⁵ Conflicting dietary advice in the media is confusing for patients. Some experts are concerned that GPs and nurses do not receive adequate training on nutrition³⁶.

Weight Management Programmes

Some Clinical Commissioning Groups pay for 12 weeks of commercial programmes such as Weight Watchers and Slimming World. They promote dietary and behavioural changes in a supportive group environment. There are also NHS-based programmes, but evidence indicates that commercial programmes are more successful.³⁷ People attending weight management programmes lose 3% of their body weight on average.³⁸ Many more do not participate. For example in Scotland, of over 5,000 overweight and obese patients contacted to take part in an NHS weight-loss programme, only one third attended the first session, of which, only 1 in 4 were male.³⁹ Overall, a quarter of participants lost more than 5% of their body weight.³⁸

Health Outcomes of Lifestyle Interventions

NICE guidance states that "the more weight [obese patients] lose, the greater the health benefits, particularly if someone loses more than 5% of their body weight and maintains this for life".³⁸ However, for most people, weight-loss through lifestyle interventions is modest³⁸ and is not maintained in the long-term. After weight loss, the body responds as if in a state of starvation: metabolism slows to preserve energy⁴⁰ and changes in circulating hormones increase hunger signals in the brain to encourage weight gain.⁴¹ These changes persist even one year after weight loss.⁴⁰ In one study, 70% of people who lost 12.5% or more of their body weight had regained the weight after two and a half years.⁴²

Box 2. Drug Treatments

The only weight-loss drug currently available on the NHS is orlistat. It prevents the breakdown of dietary fat in the gut, reducing the number of calories taken up by the body. In one trial, orlistat contributed an additional 3.3% reduction in body fat over one year when taken with a low-fat, low-calorie diet.⁴³ It is also available over-the-counter at a lower dose which is less effective. However, there are unpleasant gastro-intestinal side-effects, particularly when patients eat fatty foods. Sibutramine and rimonabant were widely prescribed to aid weight loss. They act in the brain to reduce appetite, but were withdrawn because of their side-effects.^{44,45}

Pharmaceutical companies are developing new anti-obesity drugs. In January 2015, the European Medicines Agency approved the use of a synthetic gut hormone, liraglutide, for weight-loss.⁴⁶ This mimics the natural hormones released from the gut after eating which signal to the brain that we are full.⁴⁷ In trials, it contributed an additional 6% weight loss on top of a low-calorie diet.⁴⁸ The combination drug treatment naltrexone and bupropion, which targets brain regions involved in appetite and reward, was approved by EMA in December 2014.⁴⁹ Neither liraglutide nor naltrexone/bupropion is yet available in the UK.

Tier 3: Specialist services

If primary care intervention is unsuccessful, GPs can refer patients to tier 3 services²⁵, which are usually hospital-based. Patients are individually assessed by a physician and dietitian⁵⁰ and receive psychological support such as cognitive behavioural therapy if problems such as binge eating, emotional eating, psychiatric disorders or suicidal thoughts are apparent.⁵¹ Tier 3 services also include assessing patients for surgery. Those found suitable are prepared for the lifestyle changes and follow-up required.⁵² For example, patients must eat a carefully controlled diet after surgery to maintain adequate amounts of protein and micronutrients.³⁴ Patient groups are particularly helpful for this and for supporting patients after surgery.⁵³ Options for children include residential camps and hospital-based tier 3 services tailored for children, but these are not widely available.³⁴

Tier 4: Weight-loss Surgery

The aim of weight-loss surgery is to improve the overall health of patients by preventing or improving long-term health conditions associated with obesity⁵⁴. NICE recommends that people with a BMI over 40 should be considered for surgery, or over 35 where patients already have obesity-related health problems.³² This is only after all non-surgical methods have been tried and failed to achieve clinically significant weight-loss.³² In November 2014, NICE updated guidelines, recommending that a lower threshold BMI of 30 should be used for people with recent-onset type 2 diabetes or lower if patients are also from a Black or Asian background.³²

Number of Procedures

In 2013/14, the NHS performed 5,756 surgical procedures for weight-loss.⁵⁴ This is less than 1% of patients who qualify for surgery (BMI greater than 40).⁵⁴ By comparison, in Sweden, which has lower levels of obesity than the UK, six times as many operations were performed per 100,000 people.⁵⁴ In the UK, the most common procedures are⁵⁵

Box 3. Very-low-calorie diets

Very-low-calorie diets (VLCDs) are formulated, nutritionally complete, liquid meals which contain less than 800 calories per day. Usually taken under medical supervision, these are only recommended for up to 12 weeks in people undergoing a multi-component weight management programme.³⁵ In trials, patients who completed VLCDs lost 16% of their initial weight on average. There is insufficient evidence for NICE to recommend VLCDs³², but research is ongoing.

gastric bypass, sleeve gastrectomy and gastric band.⁵⁴ A randomised controlled trial to assess the clinical outcomes and cost-effectiveness of these procedures is ongoing.

Gastric Bypass

Gastric bypass was the most common weight-loss surgery performed by the NHS in 2013, accounting for 60% of procedures.⁵⁴ The stomach is divided and the small intestine is rearranged, so food enters a small pouch, rather than the whole stomach, and bypasses part of the digestive tract⁵⁶. This irreversible procedure reduces stomach capacity and reduces absorption of food in the intestines. Each procedure costs £8,000-10,000.^{57,58} Average weight loss after three years is 65% of excess weight.⁵⁴

Sleeve Gastrectomy

This procedure is becoming more popular with surgeons and patients.⁵⁷ It is suitable for most patients, including extremely obese patients who are too high risk for gastric bypass. A large portion of the stomach is removed, reducing stomach capacity.⁵⁵ Each procedure costs £7,000-8,000.⁵⁸ Average weight loss after three years is 59% of excess weight; most of this occurs in the first year after surgery.⁵⁴

Gastric band

Insertion of a gastric band around the stomach⁵⁵ is a reversible procedure more appropriate for patients in a lower BMI range. This is the most common weight-loss surgery performed privately and the average BMI of a private patient is approximately 43.⁵⁴ Each procedure costs £5,000-6,000.^{56,58} Average weight loss after three years is 53% of excess weight.⁵⁴ The number of procedures has fallen rapidly in recent years,⁵⁴ as it is associated with more complications than gastric bypass and sleeve gastrectomy, such as slippage of the band.⁵⁷

Patients Receiving Weight-loss Surgery

In the UK, the average BMI of a patient treated on the NHS is 50.6, one of the highest averages in Europe.⁵⁴ Patients are generally of working age (87% are 25-60 years old) and 3% of patients are less than 25 years old. Only a quarter of patients undergoing surgery are male, but this is rising.⁵⁴ The range of health problems seen in patients presenting for weight-loss surgery is increasing.⁵⁴ On average, patients have 3.6 conditions associated with obesity,⁵⁴ with:

- over 70% having poor functional status (cannot climb three flights of stairs without resting)
- 55% having arthritis (may require joint replacements)
- 40% having high blood pressure
- 30% having type 2 diabetes
- 25% having depression.

Despite these high risk patients, in-hospital mortality rate is 0.07%, which is low for a surgical procedure.⁵⁴ Because of advances such as the use of laparoscopic (keyhole) surgery, average hospital stay is now 2.5 days.⁵⁴

Equality of Access

In England, weight-loss surgery is commissioned nationally.⁵⁰ However, the provision of tier 3 services is variable, and is absent in many areas.⁵⁰ Without tier 3 services patients cannot ordinarily access weight-loss surgery, leading to inequality of access.^{50,54} Some patients choose to have surgery privately, but 75% of operations between 2011 and 2013 were publically funded.⁵⁴

Outcomes of Surgery

On average, 3 years after surgery patients lost 60% of their excess body weight. Of patients who could not climb three flights of stairs, 60% could do so one year after surgery.⁵⁴ Surgery can alter the release of hormones from the gut, reducing the hunger signals which lead to regaining weight. After significant weight loss, excess skin can require cosmetic surgery.⁵³ A study following patients 20 years after surgery showed that weight loss after surgery is well maintained and life is extended.⁵⁹

Cost Effectiveness of Intervention

Direct healthcare costs attributable to overweight and obesity have been estimated to be £5.1 billion per year.¹ When lost productivity due to unemployment and absenteeism, benefit payments and other indirect costs are taken into account, current estimates of economic losses due to obesity are as high as £50 billion or 3% of GDP.⁶⁰

Non-surgical interventions are relatively cheap, but result in modest (often short-term) weight-loss. For every participant on a 12 session commercial weight management programme the NHS stands to save £230 over a lifetime.⁶¹ Weight-loss surgery costs more than non-surgical management of obesity, but results in greater health benefits⁶². One year after surgery 60% of patients with diabetes are no longer diabetic and after three years this increases to 80%.⁵⁴ So, for patients with recent-onset type 2 diabetes, the cost of surgery is saved on diabetes medication alone within 2-3 years⁶³. In one study, 14 months after surgery, paid hours worked increased 57% and state benefit claims fell by 75%.⁶⁴ An Office of Health Economics report estimated that if 25% of eligible patients had weight-loss surgery, GDP would increase by £1.3 billion and £151 million would be saved in benefits payments.⁶⁵

Tier 1: Preventing Obesity

Obesity prevention is a key part of government policy to improve public health and save the NHS money.⁶⁶ National campaigns aiming to encourage healthier diets include Change4Life, 5-a-day and the eatwell plate. Other initiatives to encourage healthier lifestyles include:

- school breakfast clubs, walking school buses, healthy school meals, school sports and cookery classes
- hospitals with healthy food options for patients and staff

- work-based activity and weight-loss programmes such as walking clubs, healthy food and gym membership
- community-based programmes to help families change their habits together such as Health Exercise and Nutrition for the Really Young (HENRY).

The Government's Public Health Responsibility Deal encourages the food and drinks industry to take voluntary action to improve public health. In England, the height and weight of children in reception (aged 4-5 years) and year 6 (aged 10-11 years) is measured as part of the National Child Measurement Programme, and parents are informed if their child is obese. Some suggest that intervention should start earlier, before or during pregnancy³⁵ as parental obesity increases the risk of childhood obesity⁶⁷ and breastfeeding lowers the risk⁶⁸. For adults, those receiving an NHS Health Check are given healthy lifestyle advice regardless of BMI.⁶⁹ A recent Health Committee Report emphasised the need for a more preventive approach using "interventions focused on encouraging individuals to change their behaviour with regard to diet and physical activity... underpinned by broader, population-level interventions".²⁸ However, there are no exemplar populations where interventions have successfully reversed the obesity epidemic.⁷⁰

Personal Responsibility and Public Health Policy

The Chief Medical Officer has expressed concern that society is "normalising" overweight⁷¹. Some clinicians believe classifying obesity as a disease may counter this normalisation, but others worry that this places too much responsibility on the NHS rather than the individual.⁷² A recent poll found that 60% of people did not think the NHS should offer weight-loss surgery.⁷³ Obese people are often stigmatised and blamed, and this may affect their psychological and physical health.⁷⁴

A wide range of genetic and environmental factors are involved in obesity. Genetic factors include rare disorders caused by single genes and more general genetic influences on appetite and behaviour.⁷⁵ Environmental factors include the increased availability of energy-dense foods and changing work and transport patterns. There are concerns that this combination of genetic and environmental factors has made overweight and obesity the "default" option.⁷⁶ Reducing obesity requires a long-term and large-scale commitment across government departments,⁷⁷ as well as strong partnerships with local authorities, the research sector, businesses and civil society.⁷⁸

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