

Obesity in adults

Obesity is a growing problem in most developed countries and is responsible for a significant degree of morbidity and mortality in the Western world. There are several facets to the problem of obesity:

- The prevention of obesity.
- The correction of obesity.
- The population-based approach.
- The individual approach.

Prevention is better than cure and easier. The population-based approach is very important but the doctor in his or her surgery will have to cope with the individual and so this will be the thrust of this article.

See the separate related article [Obesity in Children](#) for more information about this problem in children and young people.

What is obesity?^[1]

The National Institute for Health and Care Excellence (NICE) recommends the use of body mass index (BMI) to assess overweight and obese individuals. It advises the measurement of waist circumference to supplement this in individuals with a BMI under 35 kg/m². NICE advises BMI be used as a practical measure of adiposity, but warns that this should be interpreted with caution, as it is not a direct measure. Particular caution should be taken in interpreting BMI in certain groups (see section below).

The BMI

In adults, the diagnosis of obesity is most commonly made using [BMI levels](#). BMI is calculated as weight in kilograms (kg) divided by height in metres squared (m²). Ideal BMI is 18.5 to 24.9 kg/m². The following classification is advised by NICE:

- A BMI of 25–29.9 kg/m² is overweight.
- A BMI of 30–34.9 kg/m² is obese (Grade I).
- A BMI of 35–39.9 kg/m² is obese (Grade II).
- A BMI of ≥40 kg/m² is obese (Grade III) or morbidly obese, meaning that weight is a real and imminent threat to health.

There are a few exceptions that are worthy of note:

- A person who is very muscular will have a great weight in muscles and bone to support the muscles and so may have a high BMI without an excess of fat.
- In people of Asian origin, risk factors are of concern at a lower BMI.
- In the elderly, the lowest morbidity is in the group with a BMI of 25–30 rather than 20–25.^[2]

Waist circumference

Waist circumference in men:

- <94 cm is defined as low risk.
- 94 to 102 cm is defined as high risk.
- >102 cm is defined as very high risk.

Waist circumference in women:

- <80 cm is defined as low risk.
- 80 to 88 cm is defined as high risk.
- >88 cm is defined as high risk.

Waist circumference should be used in combination with BMI to assess health risk in those individuals with a BMI <35 kg/m², ie in overweight or obese grade 1 individuals, as follows.

In overweight individuals (BMI 25–29.9 kg/m²):

- Low waist circumference confers no increased health risk.
- High waist circumference confers an increased health risk.

- Very high waist circumference confers a high health risk.

In obese individuals Grade 1 (BMI 30–34.9 kg/m²):

1. Low waist circumference confers an increased health risk.
2. High waist circumference confers a high health risk.
3. Very high waist circumference confers a very high health risk.

Epidemiology

From 2018 figures, 26% of men and 29% of women are obese . This had increased from 24% and 25% respectively since 2014. A further 41% of men and 30% of women were overweight . This means most adults in England are overweight or obese.^[3] This increasing trend was seen globally but was more marked in England than in many other countries. The UK currently has the highest prevalence in Europe.^[4] Using BMI and waist circumference to assess risk of health problems, 40% of adults were at high or very high risk of chronic disease. Women were more likely than men to be in the high or very high risk categories (46% and 35% respectively).^[3]

The government estimate of the annual cost of obesity to the NHS is £6.1 million.^[5] It is forecast that this cost will increase to almost £50 billion by 2050.^[6]

Several factors have now been shown to predict the development of obesity in individuals, such as a family history of obesity, lifestyle, diet and socio-economic factors. Prevalence is higher where there is deprivation and in individuals with lower levels of educational achievement.^[7]

Genetic factors

There is increasing awareness of an element of genetic influence on obesity. The possibility of determining this opens the potential of effective interventions in the future. The mapping of the human genome, combined with evidence from single-gene mutation cases and animal cross-breeding experiments, have identified a significant link between genetic factors and obesity. It is emerging that obesity is the result of a complex pathophysiological pathway involving many factors that control adipose tissue metabolism.^[8] Cytokines, free fatty acids and insulin all play a part and genetic defects are likely to have a significant effect on the fine balance of this process.^[9]

KRS2 is one gene that has recently been identified as being implicated in obesity and metabolic rate. DNA sequencing in over 2,000 obese individuals identified multiple mutations of the KRS2 gene, and mutation carriers exhibited severe insulin resistance and a reduced metabolic rate.^[10] It may be that modulation of KRS2-mediated effects may have the potential to have therapeutic implications for obesity.

Presentation

- A patient may present directly asking for help.
- Confrontation of the problem may arise opportunistically when the patient presents for something else.
- Opportunities to measure height and weight include routine health checks, checks for those with diabetes and cardiovascular disease, and at new patient registration.
- It may be a related problem for the patient with diabetes, coronary heart disease, osteoarthritis or snoring.

Assessment^[1]

Broaching the subject

- Beware of inducing negative feelings. Explain that obesity is a clinical condition, with health implications, rather than a criticism about the way a person looks.
- Recognise that denial, anger, disbelief or surprise may affect a person's willingness to engage with change.
- For those who are not ready to make changes, offer the opportunity to return to discuss further in the future. Give information on the benefits of weight loss, healthy diet and exercise.
- Tailor all discussion to the individual; their overall health and fitness, preferences, beliefs and lifestyle.

History

- Ask: "Why do you want to lose weight?" The response may give an indication of motivation.

- Explore the person's view of their weight, and the reason they have gained weight.
- Explore eating behaviour.
- Explore beliefs about eating patterns, exercise patterns and weight.
- Explore past medical history, including history of dieting. Find out what has been successful or otherwise in the past.
- Assess readiness to make change, and confidence in making changes.
- Assess for any physical or psychological problems associated with obesity.
- Assess for comorbidity: diabetes, hypertension, cardiovascular disease, dyslipidaemia, sleep apnoea, osteoarthritis.
- Social history, including diet, exercise, occupation, smoking.
- Family history, including history of obesity, diabetes, heart disease.

Medication which may aggravate weight gain ^[11]

- Oral hypoglycaemic agents, especially sulfonylureas and thiazolidinediones ("glitazones") - so use metformin first-line. (Insulin when used in the management of type 2 diabetes can also aggravate weight gain.)
- Antidepressants including tricyclics, mirtazapine, monoamine-oxidase inhibitors.
- Anticonvulsants, particularly sodium valproate, gabapentin, vigabatrin.
- Antipsychotics, especially the atypical antipsychotics amisulpride, aripiprazole, clozapine, olanzapine, quetiapine and risperidone.
- Lithium.
- Corticosteroids.
- Beta-blockers.
- Pizotifen.

- Progestogen-only contraceptive injections.

Conditions that may affect weight^[11]

- Hypothyroidism.
- Cushing's syndrome.
- Growth hormone deficiency.
- Polycystic ovary syndrome.
- Hypothalamic damage.
- Genetic syndromes associated with hypogonadism.
- Age - in the 2018 Health Survey for England, the highest obesity levels were reported in the 55-64 age group.^[3]
- Perimenopause and menopause.
- Prior pregnancy, although this association is confounded by contributing cultural, environmental and socio-economic factors.
- Sleep deprivation.
- Less formal education.
- Low socio-economic status

Examination

- Weight, height and BMI.
- Blood pressure measurement - using an appropriately sized cuff.
- Waist circumference where BMI < 35 kg/m².

Investigations

Assess risk factors by measuring lipids and HbA1c.

In addition, a few other investigations may be required, as indicated by history and examination:

- Hormone profile including sex hormones and cortisol. Hormonal causes of obesity are rare and cortisol may be slightly elevated simply by obesity.

- TFTs – hypothyroidism is a rare cause of obesity and does not cause gross obesity.
- Other investigations, as suggested by comorbidities – eg, ECG, CXR.

Summary

By the end of the assessment, you should have an idea of:

- The degree of the problem.
- Any underlying physical contributing factors (medical problems, medication).
- Comorbidities.
- Risk of developing complications.
- Lifestyle in terms of exercise and diet.
- Person's feelings about being overweight.
- Person's willingness and motivation to try to lose weight.

Motivation for losing weight

Risks of obesity

A meta-analysis found that Grades II and III of obesity were associated with significantly higher all-cause mortality.^[12]

The National Audit Office (NAO) report included a calculation of relative risks of other diseases resulting from obesity. The risks are just averages and risks increase with increasing obesity.

Relative increased risk of diseases in obesity

Disease	Relative risk for women	Relative risk for men
Type 2 diabetes	12.7	5.2
Hypertension	4.2	2.6
Myocardial infarction	3.2	1.5
Cancer of the colon	2.7	3.0
Angina pectoris	1.8	1.8
Gallbladder disease	1.8	1.8
Ovarian cancer	1.7	N/A
Osteoarthritis	1.4	1.9
Stroke	1.3	1.3

Obesity is an important risk factor in the development of chronic respiratory disorders such as [chronic obstructive pulmonary disease \(COPD\)](#), [asthma](#), [obstructive sleep apnoea](#) and [obesity hypoventilation syndrome](#).^[13]

If the person develops a surgical condition, diagnosis is more difficult and almost every postoperative complication is more frequent, including [deep vein thrombosis](#), chest infection and wound dehiscence. Not only is [osteoarthritis](#) more common but treatments such as total hip replacements are more likely to be problematical in obesity.

Obesity increases the risk of [breast cancer](#).^[14] It also increases the risk of [carcinoma of the endometrium](#).^[15] [Polycystic ovary syndrome](#) is usually associated with obesity, as is [stress incontinence](#). Obesity impairs fertility, especially in the female.

Obesity increases the risk of [fatty liver](#), along with other features of the [metabolic syndrome](#). Fatty liver, now the most common cause of liver disease in Western countries, affects up to 90% of obese individuals.^[16] . Studies suggest that [type 2 diabetes](#) may be associated with an increase in visceral fat mass (ie abdominal fat) as opposed to general adiposity^[17]

Benefits of weight loss

Health benefits associated with weight loss include:^[18]

- Improved lipid profiles.
- Reduced disability from osteoarthritis.
- Lower all-cause mortality as well as specifically lower diabetes-related mortality and cancer-related mortality.
- Reduced risk of diabetes.
- Improved diabetic control.
- Reduced blood pressure.
- Improved lung function in people with asthma.

One study of people with type 2 diabetes showed that weight loss of 5-10% of body weight improved the chances of achieving:^[19]

- A 0.5% drop in HbA1c.
- A 5 mm Hg drop in diastolic blood pressure.
- A 5 mg/dL increase in HDL level.
- A 40 mg/dL drop in triglyceride level.

A more significant weight loss of 10-15% was associated with greater improvements.

Management^[1]

There is no quick fix. The World Health Organization sees obesity as a chronic disease. Management is not simply helping to shed some unwanted weight but a long-term approach to change attitude, habits and values for the rest of that person's life.

General points

- Multicomponent strategies are required. Which interventions to use should be tailored to the individual and their preferences, health, past history, level of risk, comorbidity and social circumstances.
- Interventional strategies to consider are dietary modification, physical activity, behavioural interventions, pharmacological interventions and surgery.
- Those health professionals involved in providing interventions for weight management should have appropriate competency and training.
- Realistic targets should be set. This includes weight loss targets of 0.5–1 kg (1–2 lb) per week, healthier eating and increased physical activity.

Overview of management of different categories of obesity

Overweight

- **Low waist circumference** – general advice on healthy weight and lifestyle.
- **High or very high waist circumference** – structured advice regarding diet and exercise.
- **Comorbidities** – structured advice on diet and activity; consider drug treatment after evaluating the effect of lifestyle changes.

Obese (I)

- **No comorbidities** – structured advice regarding diet and exercise.
- **Comorbidities** – structured advice on diet and activity; consider drug treatment after evaluating the effect of lifestyle changes.

Obese (II)

- **No comorbidities** – structured advice on diet and activity; consider drug treatment after evaluating the effect of lifestyle changes.

- **Comorbidities** – structured advice on diet and activity; consider drug treatment after evaluating the effect of lifestyle changes. Consider referring for surgery.

Obese (III)

- Structured advice on diet and activity. This may need to be via a specialised weight management programme.
- Consider starting drug treatment after evaluation of lifestyle changes.
- Consider referring for surgery.

Diet and exercise

Aim for both dietary modification and the initiation of exercise. Losing weight without exercise is very difficult. This is one reason for early intervention, before exercise is severely limited by morbid obesity, coronary heart disease, severe COPD, severe osteoarthritis or other such diseases that prevent physical exertion. The initial aim should be towards a daily 600 kcal deficit of energy requirements through change in dietary habits and exercise.

Diet

- The first problem may be to convince the patient that they are eating too much. It is important to explain to the patient that the equation about calories in and calories out has no exception. It may be helpful to ask the patient to keep a food diary, including all snacks and drinks taken.
- There are many different approaches to dieting; be flexible to find the one that suits the individual. There is not currently any evidence that one type of commonly undertaken diet programme is more effective or more safe than any other. ^[20] ^[21]
- Studies suggest that NHS weight loss programmes are less effective than commercial programmes. ^[22] ^[23]

- 2014 NICE guidelines recommend that diets should be undertaken with expert support and intensive follow-up. NICE public health guidelines in 2014 recommended that health professionals delivering advice should undertake specific training, and work within multidisciplinary teams.
- NICE guidelines of 2014 recommend diets with a 600 kcal deficit, or low-fat diets. Avoidance of very restrictive or nutritionally unbalanced diets is also advised, as these are ineffective in the long term.
- Stress the other health benefits of eating a healthy diet.
- Low-calorie and very low-calorie diets are a feature of the 2014 NICE guidelines. Low-calorie diets (800-1600 kcal per day) may be considered, but NICE points out they may be nutritionally incomplete.
- Very low-calorie diets (under 800 kcal per day) should not be used routinely. This should only be contemplated as part of a multicomponent strategy with specialist clinical support, where there is a need for rapid weight loss (such as prior to surgery). They should not be undertaken for more than 12 weeks.
- The long-term aim is a balanced healthy diet.

Exercise

- **Value of exercise** – this is more than just the calories expended in the session. It tends to increase basal metabolic rate and, after vigorous exercise, metabolism is stimulated for the next 36 hours. It is now known to reduce the risk of diabetes and cardiovascular disease. [24] It also helps people to feel good about themselves.
- **Realistic expectations** – people who are obese may have done no exercise for many years. It is important to discuss the options to find something appropriate and sustainable. It must also be something that the individual will enjoy; otherwise, they will not persevere. An over-ambitious programme is doomed to failure. An inadequate programme will confer no benefit. See the separate article [Physical Training](#).

- **Expert advice** – guidelines suggest that adults should be encouraged to do 30 minutes of moderate-intensity activity, either as one session or in bouts of 10 minutes, on at least five days a week. To prevent obesity, most people would need to do 45–60 minutes of moderate-intensity exercise every day, particularly if calorie intake is not adjusted. For those who have been obese and lost weight, 60–90 minutes per day are advised to avoid relapse.

Behavioural interventions

Behavioural interventions require the support of a suitably trained professional. Strategies advised by NICE guidelines include:

- Self-awareness of behaviour and progress.
- Stimulus control.
- Goal setting.
- Slowing of the rate of eating.
- Exploring and involving social support.
- Problem solving.
- Assertiveness.
- Cognitive restructuring (modifying thoughts).
- Reinforcing changes.
- Relapse prevention strategies.
- Strategies for dealing with weight regain.

There is little evidence on which eating behaviours can be addressed and remedied with psychological treatments.^[25] There has been little evidence for efficacy of traditional behavioural therapies, although the introduction of digital technology in this field has proved promising.^[26]

Pharmacological management

General points

- Anti-obesity medication should only be considered after diet, behavioural changes and exercise have been tried and evaluated. If the patient's weight has reached a plateau despite these measures, or if targets have not been achieved, pharmacological treatment may be considered.
- Pharmacological treatment may be used to maintain weight loss, rather than to continue to lose weight.
- Vitamin and mineral supplements should be considered, particularly for vulnerable groups like the elderly and growing adolescents.
- Those with type 2 diabetes may lose weight at a slower rate and appropriate allowance should be made.
- Regular review of adverse effects and to reinforce lifestyle advice is important.
- People being withdrawn from anti-obesity medication should be offered support because it is at this time that their self-confidence and belief in their ability to make changes may be low.

Orlistat^[27] ^[28]

- **Action** - orlistat is a lipase inhibitor which acts by reducing the absorption of dietary fat. It prevents absorption of around 30% of dietary fat.^[29]
- **Effectiveness** - orlistat significantly increases weight loss compared to placebo but its effectiveness is limited by its side-effects.^[30] Clinical trials suggest a moderate weight loss compared to placebo - about 2-5 kg over a year. There is also a small but significant reduction in total cholesterol, the ratio of total cholesterol to high-density lipids and systolic and diastolic blood pressure. Most patients gain weight after stopping treatment but trials suggest it takes three years to gain weight lost in one year on the drug.
- **Indications** - individuals with a BMI of 28 kg/m² or more in the presence of significant comorbidities (eg, type 2 diabetes, high blood pressure, hyperlipidaemia) OR a BMI of 30 kg/m² or more with no associated comorbidities.^[1] These individuals should be on a mildly hypocaloric, low-fat diet.

- **Prescription:**

- *Availability:* this is now available over the counter (OTC) to individuals with the above criteria. The recommended OTC dose is 60 mg three times a day and treatment under pharmacist care should not exceed six months. Pharmacists should check the patient's BMI on each occasion a request is made.
- *Cautions:* absorption of fat-soluble vitamins may be impaired. If on long-term therapy, monitor A, D, E and beta-carotene levels and prescribe supplementation if appropriate. If vitamin supplements are required, these should be taken at least two hours after an orlistat dose, or at bedtime. Additional contraception may be needed in women experiencing marked gastrointestinal side-effects (eg, diarrhoea). Underlying kidney disease may result in hyperoxaluria and oxalate nephropathy.
- *Contra-indications:* chronic malabsorption syndrome, cholestasis, pregnancy and breastfeeding.
- *Interactions:* [ciclosporin](#) (reduced bioavailability), acarbose (lack of pharmacokinetic data), amiodarone (reduced plasma concentrations), coumarins (enhanced anticoagulant effect due to reduced absorption of fat-soluble vitamin K), anti-epileptic drugs (decreased absorption), levothyroxine (possible risk of hypothyroidism), antiretroviral therapy (reduces absorption).^[31]
- *Common problems:* abdominal discomfort/distension, liquid oily stools, faecal urgency and increased frequency, flatulence – more so if a diet contains 2000 kcal/day and is high in fat. Other common problems include headaches, upper respiratory tract infections and hypoglycaemia. Less frequently, rectal pain, menstrual irregularities, anxiety, and fatigue occur.
- *Rare side-effects:* rare reports of hepatitis and cholelithiasis. Warn people to stop orlistat and seek medical advice if symptoms such as jaundice, itching, dark urine or abdominal pain develop.
- **Initiation** – prescribe one tablet (120 mg) before, during or up to one hour after each main meal (a dose should be missed if the meal contains no fat). No more than three tablets in a day.

- **Monitoring:**
 - Check weight at three months and at six months.
 - Consider the need to supplement with multivitamins and minerals, especially if diet is poor.
 - Specifically enquire about side-effects (especially gastrointestinal).
 - Check for new medication and drug interactions.
- **Ending treatment** - treatment should only be continued beyond three months if a further 5% of body weight has been lost since start of treatment (this target may be made more lenient for those with type 2 diabetes). The decision on use of drug treatment for longer than 12 months (usually for weight maintenance) should be made after discussing potential benefits and limitations with the patient.

Sibutramine (withdrawn)

- **Action** - this is a centrally-acting serotonin and noradrenaline reuptake inhibitor which has the effect of promoting satiety and increasing energy expenditure.^[32] Its use has been suspended in the UK amid fears that it increases the risk of heart attacks and strokes.^[33] Some researchers maintain that sibutramine could still be a useful option in patients who do not have pre-existing cardiovascular disease.^[34]

Rimonabant (withdrawn)^[35]

- Rimonabant was a selective cannabinoid 1 (CB1) receptor antagonist which has now had its marketing suspended. The European Medicines Agency completed a review of rimonabant (Acomplia®, a treatment for obesity) after concerns about its psychiatric safety - the benefits of rimonabant do not outweigh the risks of psychiatric reactions in clinical use.

Liraglutide

NICE has published an evidence summary for a new medicine – liraglutide (Saxenda®).^[36] Liraglutide is a glucagon-like peptide-1 receptor antagonist that was launched in the UK in January 2017. It is to be used in addition to a reduced-calorie diet and increased physical activity for weight management in adult patients with an initial BMI 30 kg/m² or more, or from 27 kg/m² to less than 30 kg/m² if there are other weight-related problems such as prediabetes or type 2 diabetes mellitus, hypertension, dyslipidaemia or obstructive sleep apnoea present. The treatment should be stopped after 12 weeks if patients have not lost at least 5% of their initial body weight.

Editor's note

Dr Krishna Vakharia, 23rd March 2023

Semaglutide for managing overweight and obesity^[37]

NICE has recommended semaglutide as an option for weight management – weight loss and weight maintenance. This is alongside a reduced-calorie diet and increased physical activity in adults. The criteria for use are:

Must be used in a specialist weight management service.

Must have BMI of >35 kg/m².

Must have BMI 30–30.4 kg/m² **and** a condition that can be improved with weight management, such as diabetes.

Lower BMI thresholds (lower by 2.5 kg/m²) for those in at-risk groups such as people from South Asian, Chinese, other Asian, Middle Eastern, Black African or African-Caribbean family backgrounds. These groups have a higher risk of diabetes and heart disease at lower thresholds of obesity.

Surgery^[1]

The 2014 NICE guidelines place greater emphasis on the role of bariatric surgery in the management of obesity. Guidelines advise it is an option where the following criteria are all fulfilled:

- BMI 40 kg/m² or more, or between 35 kg/m² and 40 kg/m² with other significant disease (for example, type 2 diabetes or high blood pressure) that could be improved if they lost weight.
- All appropriate non-surgical measures have been tried without sufficient effect.

- The person is under the intensive management of a specialist service.
- The person is deemed fit for anaesthesia and surgery.
- The person commits to the need for long-term follow-up. This includes a minimum of two years' follow-up within the specialist service.

It is advised that people who have developed type 2 diabetes mellitus within the preceding ten years, and have a BMI of 35 kg/m², should be offered an expedited assessment for bariatric surgery. Also those people with type 2 diabetes and a BMI of 30–34.9 kg/m² should be assessed for surgery, and offered the option where appropriate.

Editor's note

[Dr Krishna Vakharia](#), 28th July 2023

Obesity: identification, assessment and management ^[38]

NICE have updated their guidance on referral for bariatric surgery for at risk groups.

They advise to consider:

A referral for people of South Asian, Chinese, other Asian, Middle Eastern, Black African or African–Caribbean family background using a lower BMI threshold – 37.5 or 32.5 and 37.5 with a health condition such as cardiovascular disease, hypertension, idiopathic intracranial hypertension, non-alcoholic fatty liver disease with or without steatohepatitis, obstructive sleep apnoea or Type 2 diabetes.

An expedited referral for people of South Asian, Chinese, other Asian, Middle Eastern, Black African or African–Caribbean family background using a lower BMI threshold – BMI 27.5 to 32.5 – who have recent-onset (diagnosed within the past 10 years) type 2 diabetes.

For more information, see the separate article [Bariatric Surgery](#).

Alternative or complementary therapies

A number of such therapies have been put forward as remedies to the problem and may be very attractive to prospective customers. However, there is no evidence base for most of these treatments. The exception has been with acupuncture. Reviews of the literature suggest acupuncture may have benefit, but conclude that more research is needed.^[39]

Follow-up

As with any chronic disease, follow-up must be arranged. This implies interest in the patient's progress. A fortnight to a month would be appropriate at first, with intervals getting longer with time; however, treat it as a chronic disease. Follow-up will depend on the interventions used; for those who have had bariatric surgery, recommendations are particularly stringent, and require ongoing specialist input for two years.

Obesity is a chronic disease and needs to be managed throughout the person's life, as relapse is common. "Yo-yo dieting" with weight going up and down is undesirable and unhealthy.

Referral^[11]

Consider referral to a specialist obesity service (tier 3) if:

- There are underlying causes which need investigating.
- There are complex comorbidities or needs which cannot be managed in primary or secondary care.
- Conventional treatment has failed in primary or secondary care.
- Specialist interventions may be needed (eg, a very low-calorie diet or surgery).

Prognosis^[11]

Obesity is associated with decreased life expectancy. Excess mortality is greater with increasing obesity and with earlier age of onset. For those who are obese, any loss of weight is beneficial and, within reason, the more the better; most of the complications of obesity can be reduced by weight loss. However, the outlook is generally poor traditionally. Many people who have consulted a doctor about weight achieve little in terms of weight loss, or the loss is only temporary. Nevertheless, the stakes are such that every encouragement should be given to those who wish to try. Sweeping changes to the NICE guidelines encourage more radical treatment than has been used in the past, with the aim of improving prognosis.^[1]

The future

NICE public health guidelines set out strategies for all groups of society to help address the problem.^[7]

The problem of obesity needs to be addressed through a broad range of measures covering different aspects contributing to it. Thus, public health strategies are linked with matters such as town planning, convenience store planning, school food and exercise programmes and good information campaigns. The National Obesity Observatory was set up in an effort to collate the research information and to provide a single point of contact for wide-ranging authoritative information on data and evidence relating to obesity, overweight, underweight and their causes, in order to support policy makers. This is now part of the Public Health England website – see under 'Further Reading and References', below.

On a positive note, genetic breakthroughs may help with the understanding of obesity, and the promise of effective therapeutic agents in the future. Outside the UK, other anti-obesity medication has been approved. In the USA, lorcaserin (a serotonin-2C agonist) and phentermine/topiramate combinations are approved for the treatment of obesity, and have been shown to produce modest benefit.^[40]

Studies report that metformin may be an effective weight-reducing drug in patients without diabetes who are overweight and obese.^[41]

This article has focused on the management of obese individuals but the future lies in the management of an obese society and, more particularly, in curbing and perhaps reversing the growing trend. A report released by the Royal College of Physicians concluded that the NHS does not currently have the resources to deal with the obesity epidemic and that further investment is required.^[42]

The COVID-19 pandemic has taken its toll on NHS waiting times. Of patients waiting to start treatment at the end of June 2021, 68.8% were waiting up to 18 weeks. This was 16.1 percentage points higher than in June 2020.^[43] The deleterious effects this will have on NHS bariatric surgery will make the delivery of the objectives of the NICE 2014 guidelines even more challenging.

Further reading

- [Weight management before, during and after pregnancy](#); NICE Public Health Guideline (July 2010)
- [Change4Life](#)
- [National Obesity Forum](#)
- [Behaviour change: individual approaches](#); NICE Public Health Guideline, Jan 2014
- [Assessing body mass index and waist circumference thresholds for intervening to prevent ill health and premature death among adults from black, Asian and other minority ethnic groups in the UK](#); NICE Public Health Guideline (July 2013)
- [McCartney M](#); Margaret McCartney: Fat doctors are patients too. *BMJ*. 2014 Nov 10;349:g6464. doi: 10.1136/bmj.g6464.
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