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Module 15

Lifestyle advice and management of obesity in diabetes

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Matthew Capehorn

Learning objectives

After reading this article, the participant should be able to:

1. Describe how to assess and define overweight and obesity, and identify those at greatest risk.
2. Discuss the management of obesity including lifestyle advice, diet, exercise, pharmacotherapy and bariatric surgery.
3. Outline the members of the multidisciplinary team and each of their roles in managing obesity.

Key words

- Bariatric surgery
- Diet
- Multidisciplinary team
- Obesity
- Pharmacotherapy
- Type 2 diabetes

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Levels of obesity are increasing across the world due to a number of factors including an increasingly obesogenic environment, with sedentary lifestyles and easy access to calorie dense food, as well as a genetic predisposition or learnt behaviour. Obesity is accompanied by an increased risk of hypertension, coronary heart disease and type 2 diabetes. Management of obesity should be individualised and delivered by a multidisciplinary team. This article describes the definition of obesity, its management, including pharmacotherapy and surgery, and the ideal multidisciplinary obesity service, with a focus on treating people with type 2 diabetes.

Obesity in adults is an important risk factor for a number of chronic conditions including hypertension, coronary heart disease, stroke, type 2 diabetes and some cancers (Kopelman, 2007). Furthermore, obesity is also directly related to increased mortality and lower life-expectancy (Lee et al, 1993; Adams et al, 2006). In the UK, it is estimated that obesity is responsible for more than 30 000 deaths each year (6% of all deaths) (National Audit Office, 2001).

Evidence suggests that weight loss in obese and overweight people produces a variety of health benefits (Avenell et al, 2004). Clinical benefits include improvements in osteoarthritic pain, respiratory conditions and obstructive sleep apnoea (Goldstein, 1992), and a delay or prevention of type 2 diabetes in high-risk individuals (Tuomilehto et al, 2001; Knowler et al, 2002). Obesity increases the relative risk of developing type 2 diabetes by 12.7 times in women and by 5.2 times in men (National Audit Office, 2001). Studies have shown reductions in mortality in overweight individuals with type 2 diabetes associated with intentional weight loss (Aucott, 2008).

As the prevalence of obesity increases, it is expected that the associated medical

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problems will also increase. Long-term weight loss after bariatric surgery for severe obesity has also been associated with decreased overall mortality (Adams et al, 2007; Sjöström et al, 2007).

Defining obesity and identifying risk

If a person expresses an interest in adopting a healthy lifestyle and losing weight, the first step should be to measure height, weight, and waist circumference to establish whether they currently have a problem with their weight, and their degree of risk.

Body mass index

The World Health Organization (WHO, 2000) standardised the definitions of weight and obesity with its well-established classification based on BMI (*Table 1*). However, particularly muscular people can have a BMI that suggests they are obese by this classification, when in fact they may be particularly healthy, with no dangerous central/visceral fat and not at significant risk of cardiometabolic conditions.

The role of the adipocytokines released by the fat cell (now established as a highly metabolically active organ) and their link in the development of insulin resistance, inflammatory markers and dyslipidaemia is becoming clearer. Genetic and environmental factors clearly play a part in the development of insulin resistance, but they may also have a role in appetite regulation, exercise tolerance, and metabolic efficiency, causing an indirect effect on levels of adiposity (McCarthy, 2008). Excess fatty acids and the adipocytokines released by the adipose tissue will impair the action of insulin. This visceral fat will cause low grade inflammation, with oxidative stress, in particular pancreatic beta-cell stress, leading to further insulin resistance. A cycle will then develop with further beta-cell dysfunction, resulting in excess glucose production, impaired glucose uptake and utilisation, and ultimately further insulin resistance, impairment of glucose homeostasis and the development of type 2 diabetes (Brewster, 2008). One way to break this cycle is to prevent the development of the central adiposity.

Waist circumference

Evidence supports a strong correlation between increasing waist circumference and the dangerous central, or visceral, fat that sits in and around central organs (as distinct from subcutaneous fat) that increases cardiometabolic risk (Pischon et al, 2008). Furthermore, for every 5 cm increase in waist circumference there is a 17% increased relative risk of death for men and 13% for women that is independent of BMI (Pischon et al, 2008). However, more recent analyses of prospective studies suggest that the "pear" shape may not convey any lower risk than the "apple" shape, which suggests that waist circumference should supplement but not replace other indicators of risk (Emerging Risk Factors Collaboration, 2011; Huxley and Jacobs, 2011).

Therefore, until affordable tools for measuring visceral fat become available, a simple waist circumference measure is a useful indicator of risk from excess fat and should be used in addition to BMI. A waist circumference is measured by taking a tape measure reading from around the waist after expiration (breathing out). The waist is identified as the mid-point between the bottom rib and the hip bone. Central obesity in the Caucasian population is defined as a waist circumference ≥94 cm in men and ≥80 cm in women (International Diabetes Federation [IDF], 2006).

There is evidence to support lower thresholds for waist circumference in different ethnic populations but, to date, no equivalent thresholds for risk and significant risk have been accepted. However, a lower cut-off of ≤90 cm and

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Table 1. Definition of obesity by BMI (World Health Organization, 2000).

WHO classification	BMI (kg/m^2)	Risk of comorbidity
Underweight	<18.5	Low (but risk of other clinical problems increased)
Healthy weight	18.5–24.9	Average
Overweight	25.0–29.9	Mild increase
Obese	≥30.0	
Grade 1 obesity	30.0–34.9	Moderate increase
Grade 2 obesity	35.0–39.9	Severe increase
Grade 3 obesity (morbid obesity)	≥40.0	Very severe

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1. Currently, the best assessment of a healthy weight in the Caucasian population is considered to be a BMI of 18.5–25.0 kg/m^2, and a waist circumference of ≤80 cm in women and ≤94 cm in men.
2. The Health Survey for England Report showed that in 2009, 24% of women (and 22% of men) aged 16 or over were classified as obese (BMI >30 kg/m^2).
3. It is important to appreciate that obesity is a chronic relapsing condition, whether it is due to genetic predisposition, learnt behaviour, or due to the obesogenic environment.
4. Whenever possible, weight loss intervention should use the combination of low-calorie and/or low-fat diets, increased physical activity and behaviour modification so that total energy intake is less than energy expenditure.

≤80 cm has been recommended for south Asian and Chinese men and women, respectively, and a cut-off of ≤85 cm and ≤90 cm has been recommended for Japanese men and women, respectively (IDF, 2006; Tsigos et al, 2008). Similarly, there is international variation in BMI threshold for equivalent risk, and significant risk in other countries. For example, India now uses a BMI of 23 kg/m^2 for overweight and 25 kg/m^2 for obese, Japan uses a BMI of 23 kg/m^2 for overweight and 25 kg/m^2 for obese, and Singapore uses 23 kg/m^2 for overweight and 27.6 kg/m^2 for obese (Shiwaku et al, 2004; Health Promotion Board, 2005).

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Obesity prevalence

The Health Survey for England Report (Joint Health Surveys Unit, 2011), showed that in 2009, 24% of women and 22% of men aged 16 or over were classified as obese (BMI >30 kg/m^2). In total, 57% of women and 66% of men were classified as either overweight (BMI 25–30 kg/m^2) or obese. This suggests that the majority of the population, and the people that are seen in primary care on a daily basis, are more likely to have a weight problem than be of a healthy weight. If current trends continue then projections made by the Foresight (2007) report suggest that by 2050, 9 out of every 10 adults will be overweight or obese, and 50% of adults will be classified as obese by BMI.

There are an estimated 285 million people worldwide with diabetes, and more than 90% of them have type 2 diabetes, and this is projected to grow to 438 million by 2030 (IDF, 2009). In North America, over 90% of people with type 2 diabetes are (or have been) overweight or obese, or carry too much visceral fat (Gregg et al, 2007). The number of people diagnosed with diabetes in the UK has increased by more than 145 000 during 2008–9, and data recorded from GP practices show that there are now more than 2.6 million people with diabetes in the UK and more than 5.2 million registered as obese (Diabetes UK, 2009). Worldwide, 80% of people with type 2 diabetes are overweight or obese at the time of diagnosis (Finucane et al, 2011).

It is important to appreciate that obesity is a chronic relapsing condition, whether it is due to genetic predisposition, learnt behaviour, or due to the obesogenic environment. Instead of focusing on managing the consequences of obesity, the causes should be tackled and the person who is motivated to address any unhealthy weight issues should be appropriately managed.

Management of obesity

Comprehensive guidance on the prevention and management of overweight and obesity in adults and children was published by NICE in 2006 (NICE and National Collaborating Centre for Primary Care [NCCPC], 2006).

Many people may feel uncomfortable about raising and discussing the issue of body weight, but because it is such an important health concern it may fall to the clinician to broach the subject. Individuals should ideally be managed by a multidisciplinary team (MDT).

Lifestyle advice

The WHO (2000) report on obesity states that a sedentary lifestyle and consumption of high-fat, energy-dense diets are fundamental causes of the obesity epidemic. Whenever possible, weight loss intervention should therefore use the combination of low-calorie and/or low-fat diets, increased physical activity and behaviour modification so that total energy intake is less than energy expenditure. Lifestyle changes should be tailored to the individual. In the author's opinion, encouraging people to make small, manageable changes to their lifestyle is likely to be more successful than attempts to radically alter their diet and physical activity.

Diet

Diets should be tailored to the individual. Whenever possible, dictating to a person what food they should eat should be avoided to encourage adherence, and an individual's food preferences should be taken into account. In most people, avoiding unhealthy food options

will improve weight loss efforts greatly. A hypo-caloric diet that has a 500–600 kcal/day deficit below a person's daily requirement (as predicted by the Harris-Benedict or Schofield equations, or by the use of specialist equipment) or that reduces calories by lowering the fat content (low-fat diets), or total carbohydrate intake, in combination with support and follow-up, is recommended for sustainable weight loss (NICE and NCCPC, 2006).

Very low calorie diets (VLCDs; often referred to as very low energy diets [VLEDs]), which reflect a calorie intake of less than 1000 kcal/day), are an option for some overweight and obese people, but in the author's opinion, should be used under supervision if the individual is on medication or has a medical condition, such as diabetes. The short-term use of a VLCD is very effective in rapidly improving glycaemic control and promoting substantial weight loss in obese people with type 2 diabetes (Capstick et al, 1997).

Meal replacements provide a suitable option for some people. These can form part of a more structured diet plan, and normally involves a meal replacement drink for breakfast, one for lunch, then a self-prepared evening meal that should remain nutritionally balanced and healthy. These structured plans aim to limit calorie intake to 1200–1400 kcal/day.

Total food replacement programmes are the only means by which those who are subject to food abuse may avoid the food stimuli that perpetuate their weight problem, and evidence suggests that the most powerful treatment for any substance abuse is complete abstinence (Volkow and Wise, 2005).

Low-carbohydrate diets have also become increasingly popular for weight loss and appear to be at least as effective as low-fat, energy-restricted diets in inducing weight loss for up to 1 year (Nordmann et al, 2006).

Any change in diet that results in less calorie consumption, whether due to reduced portion size or less calorie dense foods, will result in weight loss. It is common for this weight loss to plateau for several reasons. Ultimately, as weight decreases, so do energy requirements and eventually calorie intake (that was previously resulting in a calorie deficit) may be equal to energy requirements. However, an individual may drift back into bad habits, and fall susceptible to the influences of the obesogenic environment. When weight loss does not plateau, the diet will need to be adjusted again, once a healthy weight has been achieved, in favour of one that is nutritionally balanced and sustainable long-term without fear of weight regain.

A change in diet may have significant impact on the treatment regimen of a person with type 2 diabetes, especially when on numerous medications, in particular oral medications that can result in hypoglycaemia, or those that are on insulin regimens. This will require careful consideration and perhaps an MDT approach involving the diabetes specialist nurse and the dietitian.

Understanding calories

Management should still start with looking for obvious problems such as lack of understanding of calories and the effect of a "day off the diet", portion control, changing snacks to less calorie-dense options, effects of alcohol and high-calorie low-fat foods, encouraging healthy, balanced eating, and the importance of regular rather than occasional exercise and its effect on energy requirements.

If an individual has diabetes, it is even more important that they, and the healthcare professionals involved in their care, appreciate the effect that erratic and/or inappropriate eating patterns can have on glycaemic control. The dietary approach taken, whether reduction in portion size, reduction in carbohydrate consumption, behaviour change resulting in different eating times, can have an impact on glycaemia. It may be useful to encourage people with type 2 diabetes embarking on a change in dietary patterns to monitor blood glucose levels more frequently, and to work closely with the diabetes specialist nurse and/or dietitian to ensure appropriate glucose homeostasis.

It is vital that the role of the energy balance equation (the need to have less energy in the form of food going into the body, or more energy being used up in the form of physical activity, in order to lose weight) and the myths

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1. The current government recommendation in England is for a minimum of 30 minutes of moderate intensity physical activity on at least 5 days per week for general health, but for weight loss or maintenance of reduced weight, physical activity should be increased to 60–90 minutes on at least 5 days per week.
2. Behavioural therapy strategies have varying levels of adherence and effectiveness, but include recording diet and exercise patterns in a diary, identifying and avoiding high-risk situations (such as having high-calorie foods in the house, or mid-morning snacks with work colleagues when not really hungry), and changing unrealistic goals and false beliefs about weight loss and body image to realistic and positive ones.

associated with calories are understood. The most established way of losing weight is the hypo-caloric diet that is 500–600 kcal less than the body requires each day. A calorie deficit of 500 kcal less each day results in a 3500 kcal deficit over the week, which should result in approximately one pound of fat loss. This does not sound a lot, until it is explained that if this can be done every week, it equates to approximately 4 lbs every month, or 1 stone every 3 months, or 4 stone every year!

Anyone on a weight loss diet should take it seriously and try to avoid any "days off the diet". However, in reality, we should accept that it is difficult to stay hypo-caloric every single day of a diet until you reach your target weight. We should counsel the individual on the harm that a "day off the diet" can actually do. Unfortunately, a "day off the diet" should mean exactly that, i.e. a day of eating the correct amount of calories that the body requires (rather than any less), and not several thousand calories more. It is easy to see how in a typical day that includes breakfast, lunch, snacks, a restaurant or take-away meal in the evening, and potentially a copious amount of alcohol, the person may have an excess amount of calories that is greater than the amount they have saved during the week of sticking religiously to their hypo-caloric diet, thus resulting in having cancelled out all of their hard work.

Physical activity

Physical activity is thought to be key to the maintenance of weight loss (Hill et al, 2005). The current government recommendation in England is for a minimum of 30 minutes of moderate intensity physical activity on at least 5 days per week for general health, but for weight loss or maintenance of reduced weight, physical activity should be increased to 60–90 minutes on at least 5 days per week (NICE and NCCPC, 2006). The level, and type, of physical activity should depend on what is achievable for the individual and should focus on what is acceptable within their normal lifestyle in order to improve adherence.

Being aware of the obesogenic environment in which we live may also be beneficial. Encouraging individuals to take the stairs instead of a lift or escalator, and parking further away from the entrance to the supermarket, for example, can be as beneficial as planned physical activity. More walking should be encouraged, especially with short distances that are travelled by car, and reduce sedentary behaviour such as watching television.

A meta-analysis of controlled clinical trials performed in 2001 showed that exercise training reduces HbA_{1c} levels by an amount that should decrease the risk of diabetes complications, although the precise metabolic changes and effects attributable to the exercise, are not yet fully understood. No significantly greater change in body mass was found when exercise groups were compared with control groups and there was insufficient evidence to define any dose-response effect of acute exercise on glucose metabolism (Boulé et al, 2001).

Behaviour therapy and "talking therapies"

Behaviour therapy involves changing diet and physical activity patterns to those that promote a more healthy lifestyle. Behavioural therapy strategies have varying levels of adherence and effectiveness, but include recording diet and exercise patterns in a diary, identifying and avoiding high-risk situations (such as having high-calorie foods in the house, or mid-morning snacks with work colleagues when not really hungry), and changing unrealistic goals and false beliefs about weight loss and body image to realistic and positive ones.

When used in combination with other weight loss approaches, behaviour therapy provides additional benefits in assisting people in losing weight (Shaw et al, 2005). The collective term "talking therapies" includes life-coaching, cognitive behavioural therapy (CBT), neuro-linguistic programming (NLP), emotional freedom techniques (EFT) and hypnotherapy.

Although the evidence for the successful use of these techniques in weight management is not yet as convincing as being equal to other interventions, and good quality randomised controlled trials are required to assess their true

role, there is no doubt that some people with diabetes prefer these approaches, and treatment should be tailored to the individual.

Pharmacotherapy

Weight-loss pharmacotherapy should be considered as part of a comprehensive strategy of obesity management. At present the only licensed medication in the UK is orlistat (Xenical; Roche, Welwyn Garden City). Orlistat is a gastrointestinal lipase inhibitor that prevents absorption of around 30% of dietary fat. It is taken orally with meals and should be prescribed only as part of an overall plan for managing obesity in adults with a BMI of 28.0 kg/m^2 or more with associated risk factors, or a BMI of ≥30.0 kg/m^2 (Electronic Medicines Compendium, 2009). Side-effects of orlistat are related to its mechanism of action and include fatty or oily stools and/or faecal urgency but this is minimised by a low-fat diet (Rucker et al, 2007).

A recent meta-analysis of 16 randomised, placebo-controlled trials of approved antiobesity drugs used in adults (over 18 years of age) for 1 year or longer reported that orlistat (n=10 631) reduced weight by 2.9 kg more than placebo (Rucker et al, 2007). These results are consistent with those of previous reviews, which reported that orlistat reduced weight by 3.3 kg more than placebo (NICE and NCCPC, 2006).

Orlistat has now been prescribed on the NHS for over a decade, and how it is prescribed has changed during this time. No initial weight loss is required prior to initiating treatment of orlistat, however to ensure that the individual understands the basic concepts of weight loss it is generally considered to be best practice to prescribe this product to people who are maintaining their weight, or have mild to moderate weight loss recorded in the month prior to prescribing, rather than in someone who is otherwise gaining weight. The product license does not specify a maximum duration of treatment, but advises that the decision to use orlistat for longer than one year (usually for weight maintenance) should be made after discussing risks and benefits with the individual.

The efficacy of weight-loss pharmacotherapy should be evaluated after the first 3 months. NICE suggests that the adult target for weight loss should be to lose 5–10% of original weight (NICE and NCCPC, 2006), but obesity consensus guidelines conclude that the a weight loss aim of 5% of the baseline body weight was appropriate, but individualised targets may well be less (Barnett et al, 2009).

There are many medications that have been associated with weight gain, including diabetes medications. Even diabetes drugs that are not directly associated with weight gain may indirectly contribute if they result in excess circulating insulin, as insulin promotes adipogenesis and weight gain (Kahn et al, 2006). NICE (2009) recommends metformin as first-line treatment for people with type 2 diabetes, providing there are no contraindications to its use, and studies have shown metformin to be weight neutral (Nathan et al, 2009). However, sulphonylureas, thiazolidinediones, meglitinides and insulin have all been shown to promote weight gain (Nathan et al, 2009).

There are new classes of diabetes medications that are more weight-friendly, and although not licensed for weight loss, their use should be considered if weight is an issue. Dipeptidyl peptidase-4 (DPP-4) inhibitors have been shown to be weight neutral, and glucagon-like peptide-1 (GLP-1) receptor agonists promote weight loss (Nathan et al, 2009; NICE, 2009).

Bariatric surgery

Bariatric surgery is the collective name for operations intended to induce weight loss. The two most common bariatric procedures are laparoscopic adjustable gastric banding and gastric bypass. In terms of weight loss and resolution of comorbidities, results with laparoscopic gastric bypass are superior to laparoscopic gastric band surgery (Tice et al, 2008). However, the choice of bariatric procedure will depend on several factors including the degree of obesity, the presence of any comorbidities and also dietary habits. An improvement in glycaemic control is often achieved within days, and is therefore not merely a result of weight loss, but rather an unidentified

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1. NICE guidance advises that people with a BMI of >40 kg/m^2, or >35 kg/m^2 with a significant comorbidity such as diabetes, should be considered for bariatric surgery, if they are clinically appropriate, and have tried and failed with all other weight loss interventions.
2. The surgical techniques should be considered a tool to facilitate rapid, and large, amounts of weight loss without experiencing the hunger that can be associated with extreme calorie deficits.
3. A number of studies looking at the rates of resolution of type 2 diabetes, following bariatric surgery have shown that procedures such as gastric bands, or gastric bypass, result in between 50 and 80% resolution.

metabolic result of bypassing part of the small bowel. However, for people who have undergone gastric bypass, nutritional supplementation is essential (Fujioka, 2005). For those who have undergone gastric banding, regular adjustments will be required, and monitoring is essential to identify any mechanical problems with the band and its position.

NICE guidance advises that people with a BMI of >40 kg/m^2, or >35 kg/m^2 with a significant comorbidity such as diabetes, should be considered for surgery, if they are clinically appropriate, and have tried and failed with all other weight-loss interventions. Furthermore, those with a BMI >50 kg/m^2 could be considered for bariatric surgery as first-line treatment because of the risk to health associated with such a level of obesity (NICE and NCCPC, 2004).

Due to limited access to comprehensive weight loss services with a multidisciplinary team approach, it could be argued that many people referred for consideration of bariatric surgery have not tried all other interventions.

Conversely, there are health-economic arguments suggesting that not enough people are proceeding to the bariatric surgery stage. If only 25% of those who meet NICE criteria, have also tried other interventions, are clinically appropriate for surgery, and are willing and able to proceed, actually had the procedure, the direct and indirect saving to the NHS and wider economic community would total £1.3 billion within 3 years. With appropriate patients, the surgery could potentially pay for itself within a year (Office of Health Economics, 2010).

Regrettably, because of the initial costs of the bariatric surgery, and current financial pressures, most PCTs will find it difficult to find the resources to invest in long-term health gains even though the health-economic case is so strong. In 2010, half of PCTs used only "elements" of NICE guidelines regarding bariatric surgery, and one in ten PCTs ignored the guidance completely (Office of Health Economics, 2010).

In the authors' opinion, bariatric surgery is a cost-effective clinical option for the morbidly obese person, but the success will be dependent on appropriate pre- and postoperative counselling provided within an MDT. The surgical techniques should be considered a tool to facilitate rapid, and large, amounts of weight loss without experiencing the hunger that can be associated with extreme calorie deficits. However, individuals still require the motivation and will-power to eat less in order to avoid problems such as vomiting or "pouching" of the stomach, and so a careful assessment of eating patterns is required. In this situation, talking therapies are as important as the skill of the surgeon.

Bariatric surgery may be a potential treatment for obese people with type 2 diabetes who are resistant to other forms of intervention. A number of studies looking at the rates of resolution of type 2 diabetes following bariatric surgery have shown that procedures such as gastric bands, or gastric bypass, result in between 50 and 80% resolution of diabetes (Dixon, 2009). The mechanism for this is not yet fully understood and more long-term data to ensure sustainability and safety is required.

The MDT approach to weight management

The National Obesity Forum promotes that the best practice for a specialist weight management intervention is based on an MDT approach.

This specialist tier of intervention for adults and children with weight problems should consist of a team of specialists that can deliver different approaches to weight loss. This would ideally include dedicated obesity specialist nurses (OSNs), healthcare assistants (HCAs), dietetian input for complex dietary needs, "Cook & Eat" for cooking skills education, talking therapies providing psychological input and support, exercise therapists who can provide personalised training programmes, and a GP with a special interest (GPSI) in obesity for any medication issues. There should also be facilities to allow for group work in relation to exercise, talking therapies and nutritional advice.

The specialist MDT service could also provide the triage and assessment for all people

being considered for further interventions, which may include bariatric surgery in adults or the attendance at residential weight management camps for children.

The initial consultation

As with all consultations, a good history and examination is vital. All people should be initially assessed for parameters including blood pressure, weight, height, BMI, waist circumference and, where possible, fat composition using bio-impedence scales. The use of bio-imepedence measurements helps to dispel some of the myths that people have that they are "big-boned", that it is "all muscle", or that it is "just fluid". Furthermore, as individuals increase their level of physical activity and hopefully increase their lean muscle mass, bio-impedence measurements can demonstrate that even in the absence of any actual overall weight loss, visceral fat (and waist circumference) may be coming down as it is being replaced by muscle which is more dense. However, an effective weight management clinic can be run with just a height measure, some accurate scales and a tape measure.

If no recent blood tests have been performed these should be taken to exclude previously undiagnosed metabolic conditions, such as diabetes and pre-diabetes states, underactive thyroid, or other associated risk factors. Standard blood tests in nearly all individuals should include fasting plasma glucose or HbA_{1c} level, thyroid function tests, liver function tests and lipid profile.

Individuals should be triaged by an OSN to assess which, if not all, of the services offered by the MDT are required, and appointments made as appropriate.

All patients should receive further basic dietary and nutritional advice as well as lifestyle and exercise education throughout the length of time they are in the weight management service. The basic nutritional information may be delivered by the OSN or appropriately qualified HCAs or, where available, it could be delivered by the facilitators in cooking skills sessions. It may not be effective to deliver nutritional information to an individual if they do not know how to implement this, due to an inability to cook from natural raw ingredients.

Patients should be invited to see any or all appropriate members of the MDT, as often as they may need to. However, they should only be weighed and measured every 4 weeks. This is specifically to overcome the effect of hormonal fluid retention that can occur,

Box 1. Simple weight loss tips and common weight loss mistakes.

Saving calories

Unless calorie counting particularly suits the individual, look for ways in which they can "save" 500 kcals from their daily diet. This may be simple reduction in portion control, or a change of snacks to alternatives, or substitution of particular foods in their meals. In some people, this may be easy. Those who always "go large" at quick service restaurants, can have the "regular" option. Twenty minutes later their ghrelin levels will fall, they will no longer feel hungry, and not miss the fact that they did not go large. Often, people find that a simple change from sugary drinks to "diet" drinks, or water, is all that is required to save those required calories. Many do not realise that alcohol has calories: each alcoholic drink should be considered as the same as a chocolate bar.

"Healthy" eating

Another common mistake is to get confused between "healthy" eating, and eating for weight loss. Obviously, in an overweight or obese person that is currently eating an unhealthy diet, we would choose to promote both a hypo-caloric diet and one that is nutritionally more balanced and "healthy". Unfortunately, many people do not realise that they can put on weight by eating too much of any healthy foods, but conversely, they can lose weight and improve health as a consequence (*Table 2*) even when eating typically "unhealthy" foods, if they eat less calories than their body requires.

"Low fat" options

People can often get caught out at the supermarket by choosing to buy "low fat" options, when in fact these may have more calories than an alternative. This might be a "healthier" choice, especially if the individual has been advised for health reasons (such as a family history of cardiovascular disease) that they need to reduce their fat (in particular their saturated fat) intake, but it is certainly not healthier if the calorific value results in putting on weight. People also purchase "premium" or "finest" supermarket ranges thinking this may convey a healthier diet, when in fact these products are often referred to as premium because they taste nicer, which can often be due to a higher fat, sugar or salt content.

Different types of sugars and fats

Other mistakes relate to the different types of sugars and fats. All types of sugars, for example sucrose and fructose, have the same amount of calories, i.e. 4 kcals per gram, and all different types of fats, for example saturated, unsaturated and poly-unsaturated, have the same amount of calories, i.e. 9 kcals per gram. Often, it is perceived that using a lot more unsaturated cooking oils is eating more healthily. This is obviously preferable to cooking with saturated fats, but using more oil may increase the overall calorific value of the food eaten, and if this is consumed and results in weight gain, then any health benefits created by swapping to unsaturated cooking fats will have been more than lost.

Page points

1. Many people eat when they are not hungry, which can present as comfort eating or habit eating, and no diet, medication or even surgery can help address this. Talking therapies provide an essential role in identifying the underlying causes for eating when not hungry and provide a suitable therapy to help break this pattern of eating.
2. Regular exercise can raise the body's energy requirement and have a significant effect on the rate of weight loss, and the key for healthcare professionals is to encourage physical activity that is greater than the recommended minimal amount of physical activity, that can easily be incorporated into their daily routine.
3. Obese people unable to achieve significant weight loss by themselves should be offered a range of help within a specialist service.

and the confusing effect that it can have on monitoring weight.

It is important to consider weight as a modifiable risk factor of disease. If the health of a person is to be improved, fat loss needs to be concentrated on, in particular visceral fat, rather than chasing the numbers on scales that only reflect overall weight. As shown, this figure will not accurately reflect fluid retention or lean muscle changes. Having looser fitting clothing may be a better indication of successful weight loss.

Other members of the MDT

It is important that, when appropriate, patients receive more intensive input and education from other members of the weight management MDT.

There should be opportunities to discuss other aspects of their lives with health trainers, talking therapists proficient in techniques such as CBT, NLP, EFT and hypnotherapy, or have access to a psychologist. Many people eat when they are not hungry, which can present as comfort eating or habit eating, and no diet, medication or even surgery can help address this. Talking therapies provide an essential role in identifying the underlying causes for eating when not hungry and provide a suitable therapy to help break this pattern of eating.

Appointments should ideally be made available with an exercise therapist, who can help to tailor a specific exercise programme suitable for the individual, and they should then be encouraged to engage with any free or subsidised local leisure facilities. It is important to explain to the person that isolated and infrequent exercise (which may still be beneficial for other reasons, and should still be encouraged) is actually an inefficient way of losing weight. The equivalent exercise that equates to walking 1 mile may only burn up approximately 100 kcals. As a reward for doing such activity, the person may then treat themselves to a chocolate bar that has 200 kcals, and the net effect is weight gain.

However, regular exercise can raise the body's energy requirement and have a significant effect on the rate of weight loss, and the key for healthcare professionals is to encourage physical activity that is greater than the recommended minimal amount of physical activity (NICE and NCCPC, 2006), that can easily be incorporated into their daily routine.

It is important that at some time, especially in the obese person with diabetes, a suitable healthcare professional assesses their coexisting medical conditions and current medications to review any that may be associated with weight gain. Recommendations may be made to change them to newer, more weight-friendly, alternatives. Appropriate patients may be considered for weight loss pharmacotherapy. This may be a role of a GPSI in obesity.

Table 2. Benefits of a 10 kg weight loss (Jung, 1997).

Mortality	● 20–25% reduction in total mortality. ● 30–40% reduction in diabetes-related deaths. ● 40–50% reduction in cancer-related deaths.
Diabetes	● Reduced risk of developing diabetes by >50%. ● 30–50% reduction in fasting glucose. ● 15% reduction in HbA_{1c} level.
Lipids	● 10% reduction in total cholesterol. ● 15% reduction in LDL. ● 30% reduction in triglycerides. ● 8% increase in HDL.
Blood pressure	● 10 mmHg reduction in systolic BP. ● 20 mmHg reduction in diastolic BP.

BP=blood pressure; HDL=high density lipoprotein; LDL=low density lipoprotein.
From: Jung (1997) by permission of Oxford University Press.

Conclusion

Rates of obesity and overweight continue to rise and substantially increase the risk of morbidity and mortality from type 2 diabetes, coronary heart disease and many other comorbidities. Obese people unable to achieve significant weight loss by themselves should be offered a range of help within a specialist service. Obesity should be treated as a chronic relapsing condition and prevention of weight regain must be part of all obesity treatment programmes. The obesity epidemic needs to be tackled by provision of sufficient resources and by sharing best practice to develop local, regional and national strategies that can reverse current trends. ■

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"Obesity should be treated as a chronic relapsing condition and prevention of weight regain must be part of all obesity treatment programmes."

CPD module

CPD module

Online CPD activity

Visit www.diabetesandprimarycare.co.uk/cpd to record your answers and gain a certificate of participation

Participants should read the preceding article before answering the multiple choice questions below. There is ONE correct answer to each question. After submitting your answers online, you will be immediately notified of your score. A pass mark of 70% is required to obtain a certificate of successful participation; however, it is possible to take the test a maximum of three times. Before accessing your certificate, you will be given the opportunity to evaluate the activity and reflect on the module, stating how you will use what you have learned in practice.

1. Using the World Health Organization classification of BMI, the range given for grade 1 obesity is which of the following? Select ONE option only.

A. 18.5–25.0 kg/m^2.
B. 25.0–29.9 kg/m^2.
C. 30.0–34.9 kg/m^2.
D. 40.0–49.9 kg/m^2.
E. Over 50.0 kg/m^2.

2. Which of the following statements about physical activity is false? Select ONE option only.

A. NICE recommends 30 minutes of physical activity per day on 5 days per week for general health.
B. Exercise helps to reduce HbA_{1c} levels.
C. Exercise should be increased to 40 minutes on 5 days per week for maintenance of reduced weight.
D. Physical activity is key to the maintenance of weight loss.
E. Increasing physical activity as part of everyday life, such as taking the stairs instead of the lift and walking more each day, should be encouraged.

3. By convention, where is a waist circumference measurement taken? Select ONE option only.

A. At the level of the belly button.
B. At the narrowest part of the abdomen.
C. At the trouser belt level.
D. Two fingers breadth above the level of the belly button.
E. Halfway between the lowest rib and the hip bone.

4. A Caucasian woman is considered to be a healthy weight (equivalent to a BMI of between 18.5 and 25 kg/m^2) if her waist circumference is which of the following? Select ONE option only.

A. ≤78 cm.
B. ≤74 cm.
C. ≤80 cm.
D. 90 cm.
E. >94 cm.

5. A 10 kg weight loss results in which of the following? Select ONE option only

A. An increase in total mortality 20–25%.
B. A reduction in HDL-cholesterol of 8%.
C. An reduction in systolic blood pressure of 15 mmHg.
D. A reduction in triglycerides of 30%.
E. A 20% improvement in HbA_{1c} level.

6. For weight loss alone, which of the following is the most important dietary factor? Select ONE option only.

A. Total calories.
B. Sugar content.
C. Salt content.
D. Fibre content.
E. Fat content.

7. Orlistat has which one of the following modes of action? Select ONE option only.

A. Improving satiety.
B. Restricting the size of the stomach.
C. Inhibiting pancreatic lipase.
D. Inducing vomiting.
E. Increasing ghrelin levels.

8. A 24-year-old man who works in a stressful office has recently had a medical examination and was found to have a waist circumference of 97 cm and a BMI of 27 kg/m^2. He has become anxious because someone suggested this increases his risk of diabetes and he has a strong family history of this. What advice would you give this individual? Select one option only.

A. Immediately start taking orlistat to reduce weight.
B. Give general dietary and lifestyle advice and advise him to monitor his weight.
C. Reassure him that at present he is okay.
D. Advise him to change jobs because of the effect of stress.
E. Advise a very low calorie diet to reduce his weight.

9. A 38-year-old woman attends your weight management clinic. She has adequately controlled type 2 diabetes (on metformin and gliclazide), and currently has a waist circumference of 93 cm and a BMI of 34 kg/m^2. She has tried a number of diets over the years and has been a member of several commercial slimming programmes with some success. She has come to you to see if she can be prescribed weight-reducing pharmacotherapy. What advice would you give her? Select ONE option only.

A. Recommend going back to the commercial slimming club.
B. Refer to the local surgeons for consideration of bariatric surgery.
C. Prescribe a glucagon-like peptide-1 receptor agonist.
D. Consider orlistat but only as part of a weight-management programme.
E. Advise her to eat less and exercise more.

10. A 45-year-old woman who has poorly controlled type 2 diabetes, osteoarthritis, and a family history of heart disease comes to see you. Her waist circumference is 115 cm and her BMI is 55 kg/m^2. She used to attend a weight-loss clinic at her previous GP surgery where she had been prescribed orlistat, and she lost approximately 5 kg. She would like to know if she could try the medication again, or consider something else to tackle her weight. What advice would you give this person? Select ONE option only.

A. Restart orlistat as it was successful in the past and follow-up in 3 months.
B. Immediately start insulin for her poorly controlled diabetes.
C. Advise trying some over-the-counter meal replacement programmes as she has not tried this before.
D. Give some basic dietary information and advise a low fat diet.
E. Check local guidelines for bariatric surgery and consider referral.