

Guidelines on the management of obesity.

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Introduction

Obesity is the major nutritional disorder of the western world. It is associated with at least 45 co-morbidities, among which are some of the biggest killers in modern society, type 2 diabetes, coronary heart disease, liver disease and certain site-specific cancers. ⁽¹⁾

Unfortunately, many members of the public, the media and some health professionals still view obesity as a condition that simply relates to overeating and exercising too little. Yet there is a strong evidence base to show that obesity is, in fact, a complex, multi-factorial disease of appetite regulation and energy metabolism that involves genetics, physiology, biochemistry and the neurosciences, as well as environmental, psychological and cultural factors. ⁽²⁾

While primary care is the obvious place for managing high-risk individuals, there is also the need for a nationwide government-led public health approach to reduce the prevalence of obesity in the population by tackling and modifying the current obesogenic environment.

The prevalence of obesity is increasing in the UK. ⁽³⁾ Therefore, it is vital that there is a multidisciplinary effort to prevent further obesity developing and to manage current levels of obesity. As obesity-related diseases rank alongside smoking as the principal cause of premature death, managing obesity must remain a high priority for the foreseeable future. In this context, GPs and other primary care health professionals have a key role to play in helping to prevent obesity and manage the health and social consequences of this condition.

These guidelines deal with overweight and obesity in adults.

Classification

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<i>Body Mass Index (kg/m²)</i>	<i>WHO Classification</i>	<i>Popular description</i>
Less than 18.0	Underweight	Thin
18.5.- 24.9	Normal	Healthy normal acceptable
25.0-29.9	Grade 1 overweight	Overweight
30.0-39.9	Grade 2 overweight	Obesity
greater than 40.0	Grade 3 overweight	Morbid obesity

(World Health Organisation 1995)

The Benefits of Weight Loss

While the bad news is that the prevalence of obesity is rising, the good news is that relatively modest weight loss results in significant benefits in the reduction of risk factors associated with obesity. The health benefits of moderate weight loss (defined as 5-10% of presenting body weight) are:

Benefits of a 10kg weight loss in an individual weighing 100kgs

Mortality

- 20% increase in overall premature mortality
- 30% reduction in diabetes related mortality
- 40% reduction in cancer related deaths

Blood Pressure

- up to 10mmHg decrease in systolic and 20mmHg decrease in diastolic blood pressure

Lipids

- reduction in LDL, VLDL and triglyceride levels and increase in HDL cholesterol levels^{4,5}

This is in addition to the psychological, physical and other metabolic benefits associated with weight loss, such as improved lung function, reduced back and joint pains, increased self-esteem and improved fertility.

Even modest reductions in the range of 5-10% of initial body weight are associated with meaningful improvements in a wide range of conditions including reduced left ventricular mass and improved cardiovascular risk profile.

A range of clinical trials have shown the benefits of increased physical activity and weight loss in preventing the conversion of impaired glucose tolerance to frank type 2 diabetes.^{6,7,8}

Clinical Assessment of the Overweight or Obese Person

History and Examination

This should begin with detailing the history of weight gain and previous weight loss attempts, as well as the weight status of parents and siblings. Then the patient's current, past and family history should be obtained after which a comprehensive clinical examination should be performed looking particularly for conditions such as hypothyroidism, Cushing's syndrome, acromegaly, diabetes and cardiovascular risk factors.

Skin examination is important as a thin atrophic skin associated with abdominal adiposity could well suggest Cushing's syndrome. Hyperandrogenim – hirsutism, acne and alopecia-F in women would raise the possibility of polycystic ovary syndrome and the presence of acanthosis nigricans (velvety skin creases especially in the axilla or around the neck) could indicate the presence of insulin resistance.

Weight and height should be measured and BMI calculated. Waist circumference should be measured half way between the lower rib margin and the upper border of the iliac crest in expiration.

Standardizing waist circumference measurement



- Place a tape measure around the bare abdomen, just above the hip bone
- Be sure the tape is snug, but does not compress the skin
- The tape should be parallel to the floor, midway between the top of the iliac crest and the lower rib margin on each side
- The patient should relax and exhale while the measurement is made

Després JP, Lemieux I, Prud'homme D. BMJ 2001; 322: 716-72

Sex specific cut off points for waist circumference

	Level 1 (Alerting Zone)	Level 2 (Action Zone)
Men	greater than 94 cms (37 inches)	greater than 102 cms (40 inches)
Women	greater than 80cms (32 inches)	greater than 88cms (35 inches)

Level 1 was initially based on replacing the classification of overweight (B.M.I. greater than 25kgm²) in combination with a height waist/hip ratio (W.H.R. greater than 0.95 in men and 0.80 in women)

Level 2 was based on classification of obesity (B.M.I. 30kg/m²) in combination with high waist/hip ratio.^{9,10}

It is also worth measuring neck circumference as a figure of 43cms or more indicates the likelihood of obstructive sleep apnoea (OSA)¹¹⁾ If OSA is suspected then an Epworth Sleep Score should be carried out. If this is high, sleep studies are indicated.

It is worth paying careful attention to the drug history as certain drugs can contribute to weight gain.

These are:

- Anti- psychotic drugs such as - olanzapine, clozapine and risperidone, but not aripiprazole
- Steroids, e.g., prednisone and oral contraceptives
- Tricyclic anti-depressants
- lithium
- Certain anti-epileptic drugs such as sodium valproate, carbamazepine and gabapentin
- Anti-diabetic drugs such as insulin, sulphonylureas and thiazolidinidiones
- Beta-blockers
- Neurontin and pregabalin⁽¹¹⁾

People on these drugs can still be helped to avoid excessive weight gain by careful food selection and increased physical activity. Some can even be encouraged to lose weight albeit at a slower rate. Also consider whether an alternative drug could be used with equal effect but less weight gain.

Investigations

The decision on whether or not to pursue investigations should follow from the clinical assessment. In many patients none will be necessary, although sometimes they can be used to counter inappropriate beliefs like “it’s me glands doctor.” The following should be considered.

- Thyroid function tests including thyroid stimulating hormone (TSH)
- Blood glucose fasting and 2 hours post-prandial where there is a suspicion of or family history of type 2 diabetes
- Fasting lipid profile, especially where there is a family history of cardiovascular disease
- Liver transaminases, alanine and aspartase, particularly in the presence of severe abdominal obesity and/or the metabolic syndrome. Raised levels could indicate the presence of non-alcoholic steatohepatitis (NASH) and referral, initially for ultrasound should be considered.

- Low testosterone levels, mainly secondary to suppression of SHBG are the rule in males. In morbidly obese males, levels as low as 5mmol/l and sometimes lower are not uncommon and as there is no cut off value in obesity this may cause diagnostic confusion. However, the suppression of testosterone in obesity is rarely sufficient to cause hypogonadism and this will usually be ruled out by demonstrating normal concentrations of gonadotrophins. Therefore there is no justification to routinely measuring testosterone in males unless there are clinical signs of hypogonadism eg failure to develop/loss of secondary sexual characteristics, small testes, gynaecomastia loss of libido or erectile dysfunction.⁽¹²⁾

Further investigations might have to be considered if there is a suspicion of or symptoms of cardiac disease or other complications of obesity. The clinician should remember that the majority of endocrine abnormalities uncovered in the investigation of the obese patient are caused by the obesity and in themselves are not causative of the obese state.⁽¹²⁾

Management in Clinical Practice: A Patient-Orientated Approach

The attitude of the professional can have a crucial effect on the success or otherwise of any weight loss/weight maintenance programme. This section suggests how healthcare professionals can work with patients towards a successful approach to weight loss and weight maintenance.

Setting the tone: How to communicate with patients

First and foremost, it is important to develop a positive rapport with patients. Central to a patient-oriented approach is one rooted in the following consultation style.

- Empathic vs. unconcerned
- Unbiased vs. judgmental
- Supportive vs. dismissive
- Optimistic vs. sceptical⁽¹³⁾

There is no escaping the fact that many people feel uncomfortable in both raising and discussing the issue of body weight. Society's view of overweight and obesity is generally very negative and many worry that raising the issue of a person's weight could be interpreted as a comment on the individual's personal appearance. The prejudice that surrounds obesity also leaves many patients reluctant to seek help for fear of being made to feel ashamed. Healthcare professionals need to examine their own attitudes and beliefs towards obesity and to consider how best to broach the subject of weight management with individual patients.

Obesity is an important health concern that needs to be raised in a sensitive, open and empathic manner

Listening carefully to the response given by patients when invited to consider a weight management programme will provide insight into their ability and commitment to lose weight. Often we say that patients need to be 'motivated' to lose weight but this is not something that is easy to assess. As discussed by Kushner & Pendarvis (1999), motivation is an internal state that the patient expresses verbally and behaviorally, but declarations of intent may not accurately reflect the true capabilities or commitment of the patient to make changes.

Do not always expect patients to express an interest in entering a weight management programme. The level of knowledge, concern for health, confidence and ability to overcome difficulties will vary among individual patients and some may justifiably decide that attempting to lose weight at this time is not practicable.

The most suitable strategy at this point is to ensure that the door is left open to revisit this discussion at some point in the future, increase understanding of the health risks associated with obesity and encourage the patient to minimise any further weight gain. Make a record of the discussion about weight management in the patient's notes to prompt a review of this and to ensure that other members of the team are aware that this has been broached with a patient. The approach should at all times be supportive

If the patient expresses interest in proceeding with a weight management programme, a number of options can be explored which could include: exercise referral, a self-help programme, a commercial slimming club or other group programme.. If a decision to treat within the practice is taken, it is important to have in place a protocol, which clearly outlines the management process. The first step should be a thorough and detailed assessment (see previous section), so that the intervention can be matched to individual needs.

The public preoccupation with body weight means that there is no shortage of individuals or groups offering the 'ultimate' treatment for weight loss. In fact, this is what separates obesity from all other health related conditions. The slimming industry is highly lucrative, and every year billions of pounds are spent by consumers on expensive slimming products that promise to make weight loss an effortless experience. With so many mixed messages provided to the public and with so

much focus on the aesthetic aspects of weight loss, it is necessary to be very clear about the purpose of embarking on a medically directed weight management programme.

The content and structure of slimming clubs vary, but in general they offer support in the form of a weekly group meeting, they follow a particular food plan and have a membership and/or attendance fee. Typically, group leaders are previous members who have personal experience of using the plan to lose weight.

Who should be targeted?

Given the scale of the obesity problem, it may be helpful to focus initial efforts on particular groups of patients. The following are suggested:

- Those who are motivated but make it clear to the non-motivated that help is available if they should want this in the future
- Those with known obesity-related co-morbidities.
- Those with a BMI > 27 kg/m² and associated risk factors.
- Those with a BMI > 30 kg/m² and a close family history of type 2 diabetes and/or premature cardiovascular disease in a first-degree relative. In fact it is now considered good clinical practice to screen all obese adults for CVS risk factors – the identification of which may well become a powerful motivating factor.
- South Asians who are a particularly high risk group.

Those not to target:

- Pregnant women - a healthy balanced diet and suitable regular activity should be encouraged to prevent excess weight gain and ensure optimal foetal nutrition.
- Breastfeeding mothers with a B.M.I. of less than 30kgm² – a healthy balanced diet should be encouraged.
- Elderly people who are otherwise healthy.

Coping with Patient Expectations

Many people have unrealistic expectations about the amount of weight they can lose and the rate of weight loss. It is therefore up to the professional to agree realistic targets to be achieved within realistic time scales.

Differences Between the Expectations of Patient and Physician in Weight Management

	<u>Patient</u>	<u>Physician</u>
Rate of weight loss	Quick	Progressive
Degree of weight loss	20%	5 – 10%
Diet duration	Weeks	Rest of life
Goals	Cosmetic Physical fitness	Risk reduction Metabolic health

	<u>Average Fashion Model</u>	-v-	<u>Average Woman</u>
Height	5'9"		5'4"
Weight	110 lbs		142 lbs
BMI	16.3 kg/m ²		24.4 kg/m ²

Returning to ideal body weight is not an appropriate goal and is considered to be counterproductive for the following reasons: ⁽¹⁴⁾ ⁽¹⁵⁾.

1. Substantial benefit, such as a 20% decline in mortality, can accrue from modest weight losses of 5 – 10 kg in one year.
2. Physiological responses limit weight loss, so it is unusual to return to normal weight.
3. Clinical trials show that many patients are unable to continue losing weight for longer than 12 – 16 weeks (4 – 8 kg loss) and that weight loss does not continue past six months.
4. Repeated failures to achieve and sustain substantial weight loss may amplify a patient's depression and lack of self-esteem and may result in further weight gain.
5. Long-term health depends on limiting weight gain over a period of years.

A realistic goal is the loss of 5 – 10% (10 kg) of body weight and then the maintenance of resultant body weight over many years. However there are some highly motivated people who can exceed these targets and achieve considerably greater weight loss.

Dietary Management Principles

If dietary management is to make an effective and long term contribution to weight loss and weight maintenance then diets must be palatable, give reasonable feelings of satiety and be capable of being followed long term.

The major aim of dietary manipulation is to reduce body fat and preserve lean tissue. If weight loss exceeds 1 kg/week this could involve the loss of lean tissue. If this happens it has implications for metabolic rate, as the level at which resting metabolic rate is set is determined by the quantity of lean tissue present ⁽¹⁶⁾. If basal metabolic rate falls then the energy requirements also fall, making it more difficult to lose weight or maintain weight loss.

Diets must be hypocaloric, without causing the individual to feel hungry. Such a diet should create a deficit of 500– 600 kcal/day in relation to total energy requirements estimated on the basis of basal metabolic rate and physical activity.

Three facts are important in considering dietary management principles:

- One gram of fat yields 9 kilo calories, one gram of protein or carbohydrate yields 4 kilo calories.
- Energy intake from fat is more easily converted into body fat than energy for carbohydrate.
- High-fat foods are often extremely palatable but less satiating.

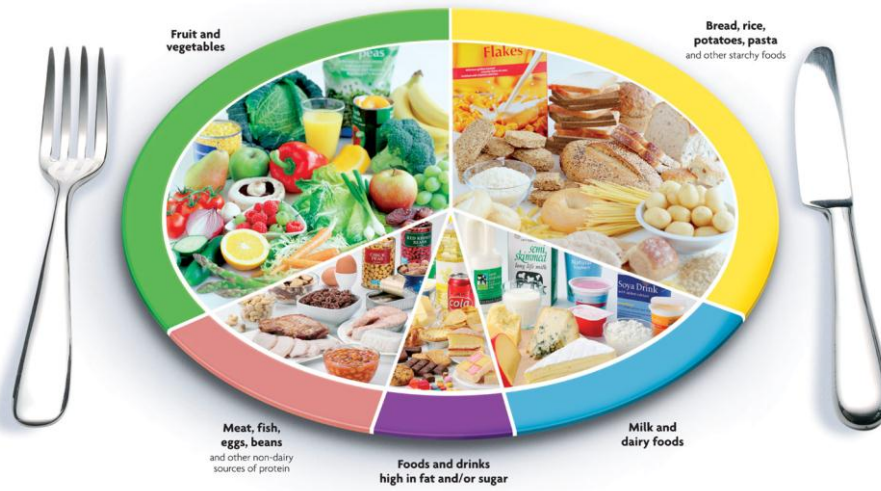
Therefore dietary programmes should be based on reducing the amount of fat in the diet.

Making Dietary Changes

The Eatwell plate is a useful tool to use to help patients achieve a healthy balanced diet to support weight management.

The eatwell plate

Use the eatwell plate to help you get the balance right. It shows how much of what you eat should come from each food group.



Within each group, it is possible to achieve a variety of choices to avoid an eating plan that is boring and repetitive which, in turn, discourages compliance.

Foods that are not included such as cakes, biscuits, pies and fizzy drinks are not banned but only used occasionally as a treat.

Changes in eating habits are more likely to be successful if:

- The whole family is involved
- Change is introduced gradually and agreed by the patient
- The diet remains palatable and maintains the “hedonistic” value of food
- Takes account of the occupation and leisure activities
- No foods are banned ⁽¹⁵⁾.

Dietary Advice

This must be:

- Accurate – advice must be based on evidence and not guesswork
- Practical – so that it can enable patients to relate to their own eating habits
- Realistic – realistic targets are set as staging posts on the path to weight reduction ⁽¹⁵⁾
- Meaningful – simple to understand and relevant to the problem being discussed
- Affordable – takes into account that many people are on a limited food budget
- Accessible – support and information is regularly available

Low Carbohydrate Diets

Such diets still attract controversy but have many advocates. A review of the literature points to the following conclusions:-

1. A one year multi-centre controlled trial showed that the low carbohydrate diet produced a greater weight loss at six months but no significant difference at one year
2. There is no evidence that they increase cardiovascular risk factors. In fact the reverse may well be the case because studies have shown that
 - They do not increase total cholesterol levels or levels of LDL cholesterol
 - They lower triglyceride levels
3. If vegetable sources of fat and protein are preferred they may moderately reduce the risk of coronary heart disease
 - they increase HDL cholesterol
 - they significantly reduce diastolic pressure
 - they reduce insulin response to an oral glucose load
4. In those with normal renal function there is no evidence that they will induce renal failure^{(17) (18)(19)}.

However, there is, as yet, not a general consensus on their long term efficacy or safety.

Very Low Calorie Diets (VLCDs)

Very low calorie diets are formulated food with an average energy content of approximately 450-800 kilocalories daily. These foods are intended for use, as presented, except for the addition of water where applicable, as the sole dietary source of energy and all essential nutrients (EU Report on tasks for scientific co-operation Sept 2002)

It is essential that they provide:-

- All the recommended daily intakes of minerals, vitamins, electrolytes and fatty acids
- Between 0.8 and 1.5 g / kg body weight of high quality protein ⁽²⁰⁾.

Using VLCD in a large scale programme it was reported that men achieved an average weight loss of 30kgs and women 31kg. ⁽²¹⁾. These results compare very favorably with conventional treatments where average weight loss is about 7kgs and only 10 per cent ever achieve reduction of 20kgs⁽²²⁾.

The weight loss achieved is a combination of the energy deficit and compliance to the diet. While no one would claim that adherence to the diet is complete, it is certainly good enough to achieve impressive results. There is some evidence that adherence can be improved by group education activities⁽²¹⁾.

There should be a definite protocol for their use which includes behaviour modification.

It is important NOT to prescribe VLCDs for patients with liver or renal disease. However, with appropriate treatment, modifications and precautions, they can be used for people with diabetes even when treated with oral hypoglycaemic agents and even insulin but doses of these agents may well need to be substantially reduced during VLCD treatment.

It is essential that their use is followed by a carefully planned maintenance programme.

Effect on co-morbidities

From a study involving over 4,000 patients it was found that ⁽²¹⁾

- ✚ Blood pressure was normalized and all drugs discontinued in 71% of hypertensives
- ✚ 8% of the studied group were diabetic and of those on oral hypoglycaemic agents, all were able to discontinue these while of those on insulin this was discontinued for 87% and dose decreased for 10%
- ✚ hypercholesterolaemia and hypertriglyceridaemia were normalized in over 70% of obese subjects, and in a further 20% of levels were lowered but not normalized.
- ✚ Proven therapeutic benefit sustained over one year in osteoarthritis of the knee and sleep apnoea.

Safety

A working group of the Committee on Medical Aspects of Food Policy (COMA) concluded that “with the present generation of VLCD preparations there has in fact been no clear evidence of risk to health or life.”⁽²³⁾

Further the Centre for Disease Control in the USA monitored their use in that country and did not find any evidence of risk.

Meal Replacements

As their name implies, meal replacements are designed to take the place of a usual meal and have a predetermined calorie and nutrient content. They come in a variety of forms such as soups, 'shakes', bars or portion control meals.

It is usually recommended that they replace at least two main meals, normally breakfast and lunch and that they are followed by a calorie-controlled evening meal. Meal replacement programmes are normally based on users having a daily intake of between 1200 – 1500 kcal but can be adjusted to any calorie intake goal.

They can be an effective alternative to dietary changes for some people because they are both nutritionally adequate and widely available.

Their use, in appropriate cases, is supported, by the British and American Dietetic Associations.

In fact, they have emerged as one of the most cost-effective tools for empowering overweight and obese individuals to lose weight and maintain weight loss over the long term. ⁽²⁶⁾

Although there are disadvantages in that they do not fit family meals, may be boring in the longer term and for some can be expensive, they undoubtedly can play an important role in helping individuals lose weight and maintain weight loss.

Low Carbohydrate/High Protein Diets

Although these attract controversy they may have a role in achieving short term weight loss in some individuals. They induce ketogenesis and initially produce greater weight loss due to fluid depletion and the formation of ketones which helps to suppress appetite. This in turn promotes reduced calorie intake.

There were initial concerns that if the protein intake were increased, blood lipid levels would be disrupted but this has not happened in clinical practice.

Most of the benefits of high protein/low carbohydrate diets appear to be in the shorter term as few data exist on long term outcomes.

Such diets can speed the progression of renal disease in people with diabetes even when only used short term.

Physical Activity (Exercise)

Introduction

Traditionally an increase in physical activity has been recommended as an important strategy for preventing obesity and as an effective addition to its treatment. Much evidence has accumulated over recent years to strengthen this recommendation.

Physical activity is any bodily movement produced by skeletal muscles that results in a substantial increase in energy expenditure over the resting energy expenditure. ⁽²⁷⁾

Activity is an important factor in both preventing and treating obesity and improving general health and well-being. It can take two main forms:

Endurance training, alone, induces modest weight and fat loss which is probably greater in obese than lean individuals.

1. Resistance training has little effect on weight, but increases fat free mass and may well help preserve lean body mass during periods of weight loss.

For most people, the easiest and most acceptable forms of physical activity are those that can be incorporated into everyday life. A good overall activity programme may include:

- Daily moderate physical activity eg brisk walking, jogging, dancing
- Some resistance exercise such as swimming or using exercise machines in the gym
- More movement and physical effort throughout the day e.g. taking the stairs instead of the lift, walking more rather than taking the car
- Taking up active hobbies and leisure pursuits such as gardening
- Less time spent in sedentary pursuits e.g. reduction in television viewing, less time playing computer games

Although the contribution of physical activity to weight loss is relatively modest, it does play a significant role in weight maintenance after a period of weight loss. In addition, it has many benefits which go well beyond its effect on weight. These are very important and are:

- Improved physical fitness
- Stimulates fat oxidation

- Improves Insulin sensitivity
- Improves lipid profile
- Reduces the risk of sudden death
- Improves psychological wellbeing
- May suppress appetite ⁽²⁷⁾
-

All physical activity counts as there is no threshold of benefit. This can be used to encourage patients no matter how low their starting point and their levels gradually increased.

Physical Activity and Weight Reduction

A review of nine randomised controlled trials and 22 non-randomised trials on exercise and weight change in overweight and obese individuals (BMI > 25 kg/m²) showed that the amount of energy expenditure by physical activity is positively associated with a reduction in body weight and total body fat in studies with a duration of sixteen weeks or less, the range of expenditure varied between 500 and 5,500kcal per week. ⁽²⁸⁾

In a meta-analysis of the effects of exercise on weight reduction in overweight patients (BMI between 25 and 30kg/m²), endurance exercise training, without dietary restriction, caused an average of 3 kg, weight loss in men over 30 weeks and 1.4 kg over 12 weeks in women, with little effect on fat free mass. ⁽²⁹⁾

An increase in physical activity should be included in any weight loss/ weight maintenance programme.

Combining Eating Modification and Increased Physical Activity

From several studies there is clear evidence that combining the two brings added benefit and reduces the loss of fat free mass. ^{(30) (31)}

Physical Activity and Weight Maintenance

Although physical activity in combination with dietary modification makes a modest difference in the degree of weight achieved, it does seem to play a crucial role in weight maintenance after a period of weight reduction. ⁽²⁷⁾

Physical Activity and Prevention of Obesity

Large epidemiological studies support the notion that a high level of physical activity has a preventive effect and that inactive behaviours such as watching TV are associated with an increased risk of obesity. ^{(31) (32)}

The position with prospective observational studies is less clear. ⁽³⁰⁾

Physical Activity and Obesity-Related Co-morbid Risk Factors

Physical activity improves many of the obesity related cardio metabolic risk factors.

Dyslipidaemia

The lipid profile found in obese patients comprises low HDL cholesterol, often raised triglycerides and smaller, denser, more atherogenic LDL cholesterol particles. The beneficial effects of physical activity are probably related to the degree of weight loss achieved, however, there is some evidence that regular exercise can increase protective HDL cholesterol. ⁽³³⁾ LDL cholesterol is more responsive to dietary changes.

Insulin Resistance

Physical activity improves skeletal muscle insulin sensitivity in individuals with obesity or type 2 diabetes. This is probably due to increased expression of GLUT 4 insulin transporters. ⁽³⁴⁾

It would appear that regular exercise can reduce insulin resistance and improve glucose intolerance in obesity even without achieving weight loss. ⁽³⁵⁾

Hypertension

Blood pressure is increased by 6 mm systolic and 4mm diastolic for a 10% gain in body fat. ⁽⁴⁶⁾

As a general rule, blood pressure is reduced by 1mm systolic and 2mm diastolic for each 1% reduction in body weight. ^{(12) (36) (37)}

Cancer

There is limited evidence that physical activity can have a protective effect on reducing the risk of colon cancer, post-menopausal breast cancer, endometrial cancer and gallstones but whether this is independent of weight loss has not been established. ⁽³⁶⁾

Recommendations

In recommending increases in physical activity, it has to be remembered that advocating more rigorous forms is associated with less compliance and a greater risk of injury. ⁽²⁷⁾ Thus, recommendations for increased physical activity need to be individualised and it should be stressed that all increases in physical activity levels are beneficial.

It should also be explained that the benefits of increased physical activity extend well beyond its contribution to weight loss and weight maintenance.

It has been estimated that in the absence of a reduction in energy intake, 45-60 minutes of moderate intensity physical activity per day are necessary to prevent the transition from overweight to obesity and 60-90 minutes of such activity to prevent weight regain after weight reduction in obese people.

For the majority of sedentary people increases in physical activity should be gradual building up to the equivalent of say 30 minutes of brisk activity daily over a period of time.

To achieve the levels of energy expenditure that will contribute to weight loss and weight maintenance, activities which involve large muscle masses are preferred. ⁽³⁸⁾

While brisk walking is suitable for many, other activities such as swimming and/or cycling would also be appropriate. The key point is for patients to be encouraged to find activities that they enjoy, fit into their lifestyle and therefore be more likely to sustain in the long term.

Risks

In promoting increased physical activity it is important to take into account the presence or absence of co-morbid conditions and risk factors, especially for cardiovascular disease. The relative risk for cardiovascular death is greatest for those who are least physically active. Such people should avoid sudden bouts of vigorous exercise and gradually increase physical activity levels over a period of time. ⁽³⁹⁾

Those with existing cardiovascular respiratory problems should develop exercise programmes in consultation with their medical advisers.

Facilitating Behaviour Change

While recognising that obesity is influenced by genetic and metabolic factors it would appear that the recent burgeoning of the prevalence of obesity is attributable to changes in eating and activity habits. Available evidence is that a combination of dietary modification, increased physical activity and behaviour change are the most effective components of a weight management programme. These should normally be combined with professional help and support e.g. by surgery based services or those provided by the commercial sector e.g. Slimming World, Weight Watchers, Rosemary Conley.

The contribution of behaviour therapy to obesity management lies in helping patients to modify their lifestyle. ⁽⁴⁰⁾⁽⁴¹⁾

The behavioural approach incorporates principles of classical conditioning – two events will become linked if they are paired together repeatedly ⁽⁴¹⁾. For example, regularly eating chocolates whilst watching television may lead to the automatic behavioural response of desiring chocolates every time the television is switched on.

A second goal of behaviour therapy is identifying the consequences of behaviours. Thus, behaviours that are rewarded are more likely to be repeated ⁽⁴¹⁾.

Behaviour therapy uses a goal-oriented approach to the management and maintenance of weight loss, in that patients are encouraged to set tangible but achievable goals with measurable outcomes ⁽⁴²⁾.

It involves devising a detailed plan of what a person will do, including when and where they will do it. For example a brisk walk for 30 minutes on each evening after the evening meal is a positive behavioural change that can be encouraged.

Self-Monitoring

This is the cornerstone of the behavioural approach to the treatment of obesity ⁽⁴²⁾. Patients are encouraged to keep detailed and honest records of food intake, physical activity and weight. This helps patients to overcome the tendency to underestimate how much they eat ⁽⁴¹⁾ and increases awareness of eating habits. It also helps to identify behaviours that need to be changed.

As patients become familiar with monitoring it can be expanded to include places and feelings associated with eating ⁽⁴¹⁾. This helps to identify problem areas. Once a problem has been identified patient and clinician can then develop plans to overcome this.

Stimulus Control

The most common stimulæ to eat are the sight and smell of food; others are places or behaviours associated with eating, e.g., walking into the kitchen or watching television. Patients can then develop coping strategies like storing the food out of sight.

On the other hand, positive cues can also be developed by replacing a box of chocolates with a bowl of fruit ⁽⁴¹⁾.

Cognitive Restructuring

This teaches patients to identify negative, irrational thoughts and replace them with more factual ones. In turn, this helps patients deal with the inevitable relapses. Then they can go on to identify behaviours that led to the relapse and work out coping strategies.

Setting realistic goals

It is important to the success of such programmes that patients are advised and encouraged to set realistic goals that they can achieve and thus feel motivated by. For example, having an initial goal of 5–10% weight loss as opposed to 25% ⁽⁴²⁾ and reminding patients that such a modest weight loss brings significant health benefits.

After achieving and maintaining a 5-10% weight loss, patients can then set further incremental but realistic targets for further weight loss.

Motivational Interviewing

This helps people to find their own solutions which are more likely to be successful in the longer term.

Pharmacotherapy in the Management of Obesity

Body weight, appetite and energy expenditure are both physiologically and voluntarily controlled and have evolved to protect against starvation. Therefore, it should not be surprising to healthcare professionals that such mechanisms are not adapted to modern times when over-nutrition rather than under-nutrition is the major problem in the developed world.

However, while 'anti-obesity' drugs should be considered as a legitimate treatment for a serious medical disorder they are not a panacea for moderate degrees of excess body fat. ⁽⁴³⁾

Principles of Drug Therapy in Obesity

Drug therapy must be complementary to calorie restriction and increased physical activity; both of which must be maintained after the drug has been started.

A decision to start drug therapy should be based on the clinician's judgment about the risks to an individual from continuing obesity.

Drug treatment should be non-addictive and improve co-morbid risk factors.

Drug treatment should demonstrate a benefit that is greater than that available by dietary modification and increased physical activity alone.

Normally weight loss on drug treatment should exceed that on placebo by at least 5%. ⁽⁴⁴⁾

Drug treatment should not be considered ineffective because weight loss stops provided a 5 - 10% weight loss is achieved and maintained. ⁽⁴⁴⁾

Long-term use should be considered where multiple risk factors are present and considerable benefits are likely to result from weight loss not achievable by lifestyle modification alone. ⁽⁴⁵⁾

Selection of Patients

The National Institute for Clinical Excellence recommends that drug therapy is cost effective in:

- Individuals with a BMI > 27 kg/m² with co-morbidities which would benefit from weight loss which has not been achieved by an adequate trial of lifestyle change

- Individuals with a BMI of $> 30 \text{ kg/m}^2$ even without co-morbidities ⁽⁴⁶⁾ where adequate weight loss has not been achieved by an adequate trial of lifestyle change.

There are a number of factors that could justify the use of drug treatment in individuals below the BMI cut-off points, such as individuals with weight-related complications of obesity, e.g., diabetes or dyslipidaemia. Also, the fact that certain ethnic groups deposit visceral fat at much lower BMI's than non-Hispanic white people. This puts them at risk of complications at lower levels of BMI. If medication is used in such groups the reasons should be carefully recorded in the case notes.

Contraindications and cautions for the use of anti-obesity medication: ⁽⁴⁶⁾

Contraindications

- Pregnancy and breast feeding
- Unstable cardiac disease
- Uncontrolled hypertension
- Unstable severe systemic illness
- History of anorexia nervosa
- Active severe psychiatric disorder
- Other drug therapy if incompatible e.g. mono-amine oxidase inhibitors, anti-migraine drugs, adrenergic agents, drugs with arrhythmia potential.

Cautions for Use

- Presence of any severe systemic illness
- History of severe psychiatric disorders
- Closed angle glaucoma
- Normally age 18 years - 65 years

Licensed Therapy in the UK

After the withdrawal of both rimonobant and sibutramine currently only orlistat is available in the UK on prescription and this is also available, albeit in a lower dose formulation, 'over the counter'.

Orlistat

This is a peripherally-acting malabsorptive agent. It has no effect on the central nervous system but acts by blocking the action of gastric and pancreatic lipase ⁽⁵²⁾. As a result one third of ingested fat is not absorbed in the intestine and passes on to the colon. Here it is either metabolised by colonic bacteria or excreted.

Evidence

Initial studies reported a weight loss of 5 – 12% body weight at 1 – 2 years ^{(52) (53) (54)}. A Cochrane review evaluated 11 orlistat studies, in which the average weight loss was 2.7 kg (or 2.9%) greater than placebo.

It appears that orlistat reduces both serum lipids and glucose ^{(55) (56)}. Patients with hypercholesterolaemia, (cholesterol > 6.2mm/L) treated with orlistat showed reductions of total cholesterol and LDL cholesterol of 11% and 10% respectively. ⁽⁶⁴⁾

Weight loss achieved by a combination of lifestyle change and the use of orlistat results in a reduction of the ratio of intra-abdominal to subcutaneous fat, thus suggesting a selective and independent action of orlistat on visceral fat. ⁽⁵⁵⁾

The XENDOS study demonstrated that orlistat remained effective over a four-year period and that compared with lifestyle changes alone, orlistat plus lifestyle changes resulted in a 37% greater reduction in the incidence of type 2 diabetes over a four year period in a clinically representative obese population with impaired glucose tolerance. ⁽⁵⁶⁾

HbA1c reduction of 0.9% in line with most OHAs.....

Side Effects

These are predominantly gastrointestinal and include: abdominal pain, diarrhoea, occasional incontinence and gas. If an inappropriately high fat diet is consumed. ^{(54) (55)} These can be minimised by reducing the saturated fat content of the diet.

Concern has been expressed about the possibility of a malabsorption of fat soluble vitamins but clinically this does not appear to be the case. ⁽⁵⁷⁾ However, the manufactures recommend that patients on orlistat take a vitamin supplement.

Dosage 120 mgm three times a day before or with meals. If a meal is missed, a single capsule can be omitted.

Patients on orlistat should be encouraged to avail themselves of the support service provided by the manufacturers.

Management of Obesity – The Place of Surgery

Until quite recently in the UK, bariatric surgery was an underused approach to the management of severe obesity. Even now (2009) the relative shortage of dedicated surgical units and the unwillingness of commissioners to fund it both mean that many who could benefit substantially are still denied access to a proven treatment.

All currently available procedures are effective in achieving substantial weight loss and improvements in both health and the quality of life.

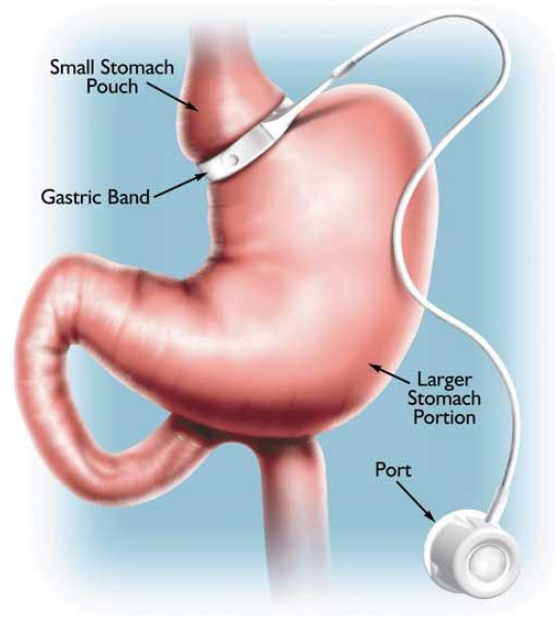


Figure 1

Characteristics of the ideal surgical procedure:-

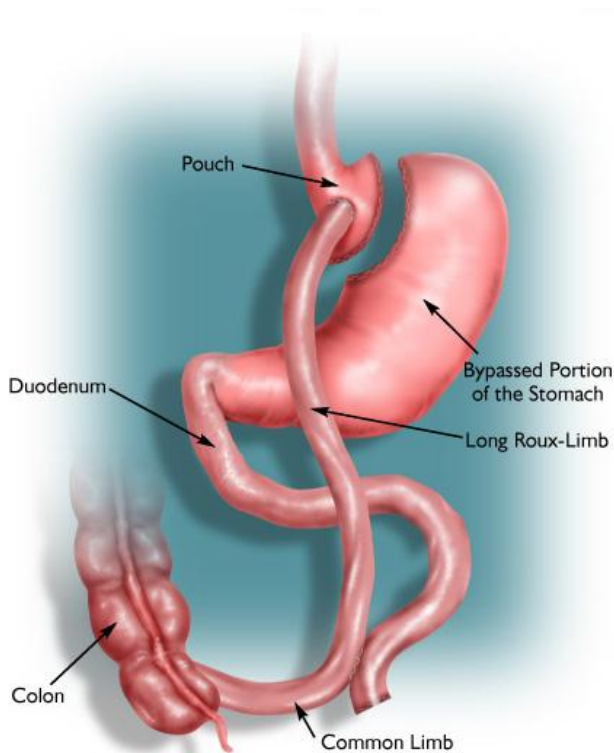


Figure 2

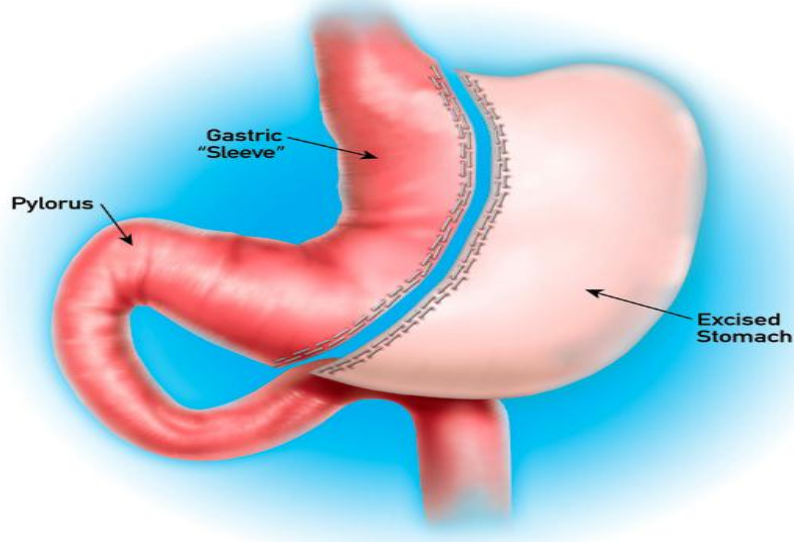


Figure 3

- ✚ Be very safe
- ✚ Be minimally invasive
- ✚ Produce and sustain effective weight loss over time
- ✚ Be effective at reducing co-morbidities and improving quality of life
- ✚ Have minimal side effects
- ✚ Have a low re-operative rate
- ✚ Be reversible
- ✚ If possible, be controllable/adjustable/reversible⁽⁵⁸⁾

Procedures

Surgical weight loss procedures used currently in the UK consist of gastric banding (see fig 1), gastric bypass (see fig 2), sleeve gastrectomy (see fig 3) and duodenal switch. All procedures can be performed laparoscopically, although there may be occasions when open surgery is more appropriate.

Banding and bypass procedures are by far the commonest. Duodenal switch surgery is not widely available and vertical banded gastroplasty is no longer practiced.

Beneficial outcomes

Recent studies report sustained total body weight loss figures of 20% and 35% for gastric banding and bypass respectively.⁽⁵⁹⁾ Greater weight loss can be achieved by duodenal switch, although the long term outcomes are unknown.

Type 2 diabetes

In a study of 50 diabetic patients followed for one year after laparoscopic gastric banding there was complete remission of diabetes in 32 cases as well as improved control in the bulk of the remainder.⁽⁶²⁾ The reported figure for gastric bypass is 99%⁽⁵⁹⁾

It appears that the weight loss after surgery is associated with the dual effects of improved pancreatic function and insulin sensitivity. ⁽⁶⁰⁾

Hypertension

There is evidence of a reduction in both systolic and diastolic blood pressure sustained to at least four years. ⁽⁶⁴⁾

Dyslipidaemia

After surgery there is elevation of protective HDL-C and an improved total cholesterol-HDL-C ratio. ⁽⁶¹⁾

Gastric-aesophageal Reflux Disease

This is extremely common in the morbidly obese. In one study of 87 such patients 79 had a total resolution of the problem at one year on from operation. ⁽⁶²⁾

Obstructive sleep apnoea (OSA)

There are major reductions of sleep apnoea, habitual snoring and daytime sleepiness. ⁽⁶³⁾

Asthma

There has been a demonstrated improvement of asthma symptoms, severity and the need for medication and hospital admission after surgically induced weight loss. ⁽⁶³⁾

Depression

This is quite common in people who are morbidly obese. Weight loss induced by laparoscopic gastric banding is associated with a significant reduction in depressive symptoms as measured by the Beck Depression Inventory scoring system.

Quality of Life

One large study has reported a large improvement in the quality of life after weight loss induced by laparoscopic gastric banding. ⁽⁶³⁾

Reduction of Premature mortality: SOS 15 year data Dec 2007 shows huge reduction in premature mortality

Selection of patients

- ✚ There is now no age limit
- ✚ BMI greater than 35 with remedial co-morbidities (sleep apnoea, type 2 diabetes)
- ✚ All applicable medical measures have been tried
- ✚ Committed to long term follow-up
- ✚ No clinical or psychological contra-indications
- ✚ Consider as first line option if BMI is greater than 50 but medical treatment e.g. very low calorie diets or meal replacement can be used while undergoing assessment and waiting for surgery.

NB It is most important that people are aware of the permanent lifestyle changes that are required of them before they are referred.

Conclusion

There has been a recent improvement in the number of institutions offering bariatric surgery (at varying levels). However, there are still insufficient surgeons, support staff and funding to meet the potentially enormous demand.

Nonetheless, surgery has been proved to achieve sustained weight loss, improve cardiometabolic and other associated risks and conditions as well as improve the quality of life expectancy for morbidly obese individuals.

While bariatric surgery has been shown to be effective both in the short and long term normalizing of co-morbidities it is likely that it's use will have to be rationed in the future. In addition several of the procedures require very long term and skilled follow-up which will be a further drain on hard pressed medical resources so that prevention has to remain the long term goal.

Tackling obesity effectively will require widespread multidisciplinary working. Therefore the Society wishes to indicate its willingness to work collaboratively with government and other organisations dealing with the problems associated with obesity. It particularly welcomed the publication of the Foresight Report which called for such collaboration.

References

1. Prentice, A. (1997) in Ed Finer N British Medical Bulletin; 53 (No.2): 229-237.
2. Thomas, P.R. (ed) (1995) Weighing the options National Academy Press, Washington.
3. Zaninolto P., Wardle H, Stamatakis E et al 2006. Forecasting obesity to 2010. Report prepared for UK Department of Health.
<http://www.dh.gov.uk/en/publicationsandstatistics/PublicationsStatistics/DH4138630>
4. Jung R Obesity the disease. Br Med Bull 1997: 53 (2): 307-321
5. Barnett A, Diabetes, obesity and cardiovascular disease p 21, Medical Education Partnership Ltd, London 2005
6. Pan X R, Lig W, Huy H, Effects of diet and exercise in preventing NIDDM in people with impaired glucose tolerance. The Da Qing IGT and Diabetes Study Diabetes Care 1997, 20 (4): 537-44
7. Tuomilehto J, Lindstrom J, Eriksson J G et al, Prevention of type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. N. Eng. J. Med. 2001; 344 (18): 1343-50
8. Knowler W C, Barrett-Connor E, Fowler S E et al. Reduction in incidence of type 2 diabetes with lifestyle interventions or metformin. N.Engl. J. Med. 2002; 346 (6): 393-403
9. Han, T S, Van Leev, E M, Seidell J C et al Waist circumference action levels in the identification of cardiovascular risk factors: prevalence in a random sample. BMJ 1995; 311: 1401-5
10. Lean MEJ, Han T S, Movvison, C E Waist circumference indicates the need for weight measurement. BMJ, 1995; 311: 158-61
11. Kopelman, P.G, (2005) In Kopelman P.G, Caterson I.D, Dietz W.H. Clinical obesity: 319-326 Blackwell Publishing.

12. Pinkney, J Obesity and disease: hormones and obesity in Eds Kopelman, P G, Caterson, I D, Dietz, W H Clinical Obesity (2005) pp 198-212 Blackwell Science
13. Jung, R. (1997) in Ed. Finer N. British Medical Bulletin 53 (No.2) 307-321.
14. International Obesity Task Force (1998)
15. Formiguera X (1999) Diet in obesity management, appraisal and recommendations. Presentation at EASO.
16. Garrow JS (1992) Treatment of obesity. Lancet 30.409-413
17. Halton, T L, Willett, W C, Simin Lin, PH et al (2006) Low Carbohydrate Diet Score and the Risk of Coronary Heart Disease in Women. NEJM; 355: 1991-2002
18. Foster, G D, Wyatt, HR, Hill, JO et al (2003) A Randomised Trial of a Low Carbohydrate Diet for Obesity NEJM; 348: 2082-2090
19. Liu, S, Willett, W C, Stampfer, MJ et al (2000) A prospective study of dietary glycaemic load, carbohydrate intake and risk of coronary heart disease in US women. Am J Clin Nutr; 71: 1455-1461
20. Franklin J, Summerbell C (2005) Dietary management of obesity; eating plans in Eds Kopelman P, Caterson ID, Dietz LH Clinical Obesity in Adults and Children, Blackwell Publishing 2nd Ed 327-349.
21. Kirschner, MA, Schneider, G, Ertel, NH et al (1988): Int J Obesity 12, 69-80
22. Wing, RR and Jeffrey, RW (1979) Int J Obesity 3, 261-279
23. DHSS (1987) Report on health and social subjects, 31. The use of very low calorie diets in obesity. London HMSO
24. Stock, MJ (1989) Int J Obesity 13 (Suppl 2), 61-65
25. Kreitzaran, S, Coxon, A, Brodie, D et al (1989) Int J Obesity 13 (Suppl 2) 161-162

26. Heymsfield, SB et al Weight management using a meal replacement strategy: Meta and pooling analysis from six studies. *Int. J. Obesity* 2003; 27: 537-549
27. Saris WHM (1998) Physical activity in the treatment of Obesity. Paper Delivered EASO Diedesheim Germany
28. VanBaak MA Saris WHM (2005) Exercise and obesity in Eds. Kopleman P, Callerson JD, Dietz WH. *Clinical Obesity in Adults and Children* 2nd Edition. Blackwell Publishing 363-379.
29. Ross R Janssen I (2001) Physical activity total and regional obesity; dose response considerations. *Medicine and Science in Sport and Exercise* 33 (Suppl) S521-S527.
30. Garrow JS, Summerbell CD (1995) Meta-analysis: effective of exercise with and without dieting on the body compensation of overweight subjects. *European Journal of Clinical Nutrition* 49, 1-10.
31. Donnelly JE, Hill JO, Jacobson DJ et al Effects of 16 month randomised controlled exercise trial on body weight and composition in young overweight men and women. *Archives Internal Medicine* 163, 1343-1350
32. Ha FB, Li TY, Colditz et al (2003) Television watching and other sedentary behaviours in relation to risk of obesity and diabetes mellitus in women. *Journal American Medical Association* 289 1785-1791.
33. Stefanick ML (1999) Physical activity for preventing and treating obesity – related dyslipoproteinemias. *Medicine and Science in Sport and Exercise* 31 (Suppl) S609 – S18.
34. Gill JMR, Herd SL, Hardman AE (2002) Moderate exercise and post prandial metabolism: issues of dose response. *Journal of Sports Science* 20, 961-967.
35. Henriksen ET (2002) Effects of acute exercise and exercise training on insulin resistance. *Journal Applied Physiology* 93, 788-796.
36. Rissanen A, Fogelholm M (1999). Physical activity in the prevention and treatment of other co-morbid conditions and impairments associated with obesity: Current evidence and research issues. *Medical and Science in Sports and Exercise* 31 (Suppl) S635-S645.

37. Reisen E, Abel R, Modan M et al – The effect of weight loss without salt restriction on the reduction of blood pressure in overweight hypertensive patients. *New England Journal of Medicine* 1978; 296:1-6.
38. Saris WHM, Blair SN, Van Baak et al. How much physical activity is enough to prevent unhealthy weight gain? Outcome of the IASO, 1st Stock Conference and Consensus Statement. *Obesity Reviews* 4, 101-114.
39. Thompson PD, Buckner D, Pina IL et al. American Heart Association Council on Clinical Cardiology Subcommittee on Exercise. Rehabilitation and prevention. *Circulation* 107:3109-31016.
40. Wadden, T.A, Brownell, K.B and Foster, G.D (2002) Obesity: Responding to the global epidemic. *Journal of Counselling and Clinical Psychology* 70,510-525.
41. Brownell, K.D (2000) The LEARN programme for weight management Dallas: American Health Publishing.
42. Wadden, T.A and Butryn M.L. (2003) Behavioural treatment of obesity. *Endocrinology and Metabolism Clinics of North America* 32, 981-1003.
43. Kopelman P, (1988) Anti obesity drugs. *Family Medicine* 2.28.
44. Finer N 1997. Present and future pharmacological approaches. *British Medical Bulletin* 53 409-432.
45. Royal College of Physicians (1998) Clinical management of overweight and obese patients with particular reference to the use of drugs. RCP London
46. National Institute of Clinical Excellence (NICE) 2001 Guidelines on the use of drugs in obesity.
47. Ryan DH, Kaiser P, Bray GA (1995) Sibutramine a novel new agent for obesity treatment. *Obesity Research* 3 (Suppl 4) 5545-559S.
48. James WPT, Astrup A, Finer N, et al (2000). Effect of sibutramine on weight maintenance after weight loss a randomised trial. *STORM Study Group Lancet* 356, 2119-2125.

49. Padwal R, Li SK, Lan DC (2003 a &b) Long term pharmacotherapy for obesity and overweight . Cochrane Database System Review 2003 CD 004094.
50. McNulty SJ, Ur E, Williams G et al. Multicentre Sibutramine Study Group (2003). A randomised trial of sibutramine in the management of obese type 2 diabetes patients treated with metformin in *Diabetes Care* 26,126-131.
51. Appolinaria JC, Bacaltchuck J, Sichiavi R, et al (2003) A randomised, double blind, placebo controlled trial of sibutramine in binge eating disorder. *Archives of General Psychiatry* 60, 1109-1116.
52. Sjostrom L, Rissanen A, Andeven T, et al (1998). Randomised placebo controlled trial of orlistat for weight and prevention of weight regain in obese patients. European Multi Centre Orlistat Study Group. *Lancet* 352, 167-172.
53. Lucas CP, Boldrim MN, Reaven GM. (2003) Effect of orlistat added to diet (30% of calories from fat) on plasma lipids, glucose and insulin in obese patients with hypercholesterolaemia. *American Journal of Cardiology* 15, 961-964.
54. Tonstad S, Pometta D, Erkelens DW et al. (1994) The effect of the gastro intestinal lipase inhibitor orlistat on serum lipids and lipoproteins in patients with primary hyperlipidaemia. *European Journal of Clinical Pharmacology* 46,405-410.
55. Tukkainen M, Bergholm R, Rissanen A et al (2004). Effects of equal weight loss with orlistat and placebo on body fat and serum fatty acid composition and insulin resistance in obese women. *American Journal of Clinical Nutrition* 79 (1), 22-30.
56. Torgerson JS, Hanptman J, Bolarin MN et al (2004) Xenical in the prevention of diabetes in obese subjects (XENDOS) Study. *Diabetics Care* 27: 155-161.
57. McDuffic, J.R., Calis, K.A., Boothsh et al (2006b) Effects of orlistat on fat soluble vitamins in obese adolescents. *Pharmacotherapy* 22 814-822
58. Kral J.G (1995) Obesity in Lubin M.F et al (eds) *Medical management of the surgery patient* 3rd edition. Lipincott, Philadelphia P.A pp 415-423

59. Wittgrove A.C Clark G.W (2000) Laparoscopic Gastric Bypass, Roux-en-Y-500 patients; technique and results, with 3-60 month follow up. *Obesity Surgery* **10**, 233-239
60. Dixon J.B., Dixon M.E., O'Brien P.E 2003 (b) Improvements in insulin sensitivity and beta cell function (H.O.M.A) with weight loss in the severely obese. *Dietetic Medicine* 20, 127-134
61. Busetto. L., Pinsentic., Rinaldi D. et al (2000) Variation in lipid levels in morbidly obese patients operated with LAP. BAND adjustable gastric banding system: effects of different levels of weight loss. *Obesity Surgery* 10, 569-577
62. Dixon J.B., O'Brian P.E (1999) Gastro-oesophageal reflex in obesity. The effect of lap-band placement. *Obesity Surgery* 9, 527-531
63. O' Brien, P.E., Dixon, J.B. Brown. W et al (2002) The laparoscopic adjustable gastric band (Lap-Band) a prospective study of medium-term effects on weight; Health and the quality of life. *Obesity Surgery* 12, 652-660
64. Dixon J.B., O'Brien P.E (2002a) Health outcomes of severely obese type 2 diabetic subjects 1 year after laparoscopic adjustable gastric banding. *Diabetes Care* 25, 358-363