

EXERCISE FOR OBESITY PATIENTS

Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health, leading to reduced life expectancy and/or increased health problems. Whilst some people are more susceptible to weight gain for genetic reasons, the fundamental cause of obesity is consuming more calories than are expended in everyday life (National Audit Office). Body mass index (BMI), a measurement which compares weight and height, defines people as overweight (pre-obese) if their BMI is between 25 kg/m² and 30 kg/m², and obese when it is greater than 30 kg/m².

Obesity increases the likelihood of various diseases, particularly heart disease, type 2 diabetes, breathing difficulties during sleep, certain types of cancer, and osteoarthritis. Obesity is most commonly caused by a combination of excessive dietary calories, lack of physical activity, and genetic susceptibility, although a few cases are caused primarily by medications or psychiatric illness, genes, endocrine disorders.

Evidence to support the view that some obese people eat little yet gain weight due to a slow metabolism is limited; on average obese people have a greater energy expenditure than their thin counterparts due to the energy required to maintain an increased body mass.

The point at which overweight becomes detrimental to the health of a particular individual will depend on a number of variables, such as genetics, fat distribution, dieting history, lifestyle and physical activity levels.

Excessive intake of dietary fat and sugar levels leads to an increased insulin response to sugar. Since insulin stimulates storage of free fatty acids in adipose tissue, this altered function will encourage fat deposition for example. But even if your genes make weight gain more likely, it is not inevitable that you will be overweight.

Obesity develops from:

- overeating
- irregular meals
- lack of daily physical activity.

This is why obesity has trebled since 1980, when only 6 per cent of men and 8 per cent of women were obese. In this time our lifestyles have changed rapidly, with the ready availability of convenience foods and car journeys replacing walks to work and school.

PREVALENCE OF OBESITY

Modern lifestyle has resulted in overweight and obesity being accepted as near normal conditions arrived at by change over three decades in work patterns, transport, leisure pursuits, food production, high calorie drinks and food sales. The Foresight report predicts that, by 2050, around 60% of the adult population will be obese with a further 35% overweight.

If this trend continues obesity will easily surpass smoking as the greatest cause of premature loss of life. Obesity has become a major health issue. It is associated with poor clinical outcomes and is also a major contributory factor for some of the commonest causes of death and disability in developed economies, most notably greater rates of diabetes mellitus and accelerated onset of cardiovascular disease.

In the majority of European countries the prevalence of obesity has increased between 10 and 40% in the last 10 years, but in England, it has almost doubled.

In any GP practice of 10,000 patients about 1,600 men and 1,300

COST TO THE NATION OF OBESITY

Based on the Foresight projections of BMI to 2050, the potential future annual health service costs of diabetes, coronary heart disease and stroke are predicted to rise significantly, assuming that all variables other than BMI remain at current levels. Factoring in the estimate that currently £4.2 billion of the £17.4 billion is attributable to overweight and obesity, the total variables other than BMI remain at current levels. Factoring in the estimate that currently £4.2 billion of the £17.4 billion is attributable to overweight and obesity by 2050 is £9.7 billion. This figure does not include the health costs attributable through obesity causing CHD, Diabetes, Stroke, some forms of Cancers and Hip and Knee operations.

OVERWEIGHT AND OBESITY PREVALENCE

- According to the UK National BMI percentiles classification, around three in ten boys and girls aged 2-15 were classed as either overweight or obese (31% and 29% respectively)(UK90data).

The equivalent figures for children aged 2-10 were 29% and 26% (HSE data)

- Among boys and girls aged 2-15, obesity prevalence rates were higher in the lowest income group. The proportions obese in the highest and lowest income quintiles respectively were 15% and 20% for boys, 9% and 20% for girls.
- Among girls, overweight/obesity prevalence varied by overall physical activity levels. 33% of girls aged 2-15 in the low physical activity group were classed as either overweight or obese, compared with 27% of the high group. Equivalent figures for girls aged 2-10 were 32% and 23%. The same pattern was not apparent among boys.
- Among girls, obesity prevalence rates were higher in households where both natural parents, or the lone natural parent, were classed as either overweight or obese. 22% of girls aged 2-15 living in households with overweight/obese parents were classed as obese compared with 8% in households where either parents or the lone parent were not overweight or obese.

Equivalent figures for girls classed as either overweight or obese were 37% and 16%. The same pattern was not apparent among boys. BMI, overweight and obesity prevalence trends 1995-2006.

- While there were year to year fluctuations, mean BMI increased among children between 1995 and 2006. There was an overall increase over the period of 0.7 kg/m² for boys aged 2-15 and 0.6 kg/m² for girls.
- Obesity among children also increased. Between 1995 and 2006 obesity prevalence among boys aged 2-15 increased overall by 6 percentage points (pp) (from 11% to 17%), with some fluctuation between years. The equivalent increase for girls was 3 pp (from 12% to 15%).

- The same pattern was generally apparent among both younger children aged 2-10 and older children aged 11-15, although there was some fluctuation between years. Between 1995 and 2006, obesity prevalence among boys aged 2-10 increased overall by 8 pp (from 10% to 17%). The equivalent increase for girls was 3 pp (from 10% to 13%). Among boys aged 11-15 the proportion who were obese increased from 14%.

Being obese at any age has huge detrimental effects on health and well being. Obesity at the age of 40 reduces life expectancy by 7.1 years for women and 5.8 years for men. 4 Given the massive detrimental effect of obesity on health and wellbeing, all health professionals should know how obesity should be managed.

COST TO THE NATION

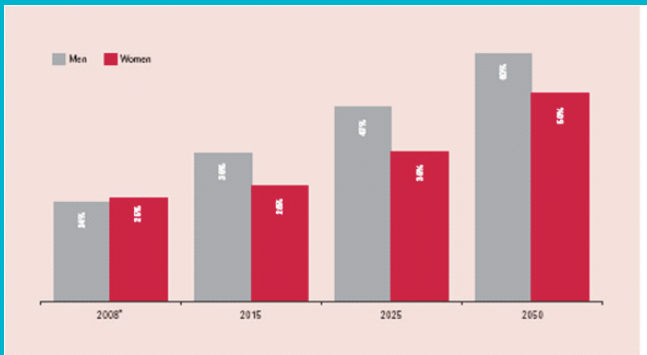
Obesity incurs a substantial economic and human cost. It contributes to the onset of disease, incidence of disability and premature death. There had been increasing awareness over the previous decade that trends in obesity are a significant issue. The health impact of obesity on England has been recognised by the Government. The Department of Health commissioned a cost-of-illness study to enable estimates to be prepared on the costs of obesity in England. The National Audit Office report, Tackling Obesity in England, published in 2001, was the result of this commission (National Audit Office 2001). The report concluded that obesity accounted for 18 million lost working days due to associated illness and 30,000 deaths in 1998 for England. The direct cost of treatment of obesity and associated co-morbidities was estimated at £480m or 1.5% of the total NHS expenditure in England.

The financial and economic impact of obesity on the health and wealth of England has been clearly established. The most recent reported official figures estimated the financial impact of obesity on the NHS at £4.3bn (Department of Health 2010).

The Department of Health reported that "Around 10% of all cancer deaths among non-smokers are related to obesity. The risk of coronary artery disease increases 3.6 times for each unit increase in BMI, and the risk of developing type 2 diabetes is about 20 times greater for people who are very obese (BMI over 35), compared to individuals with a BMI of between 18 and 25.

These diseases can ultimately curtail life expectancy. Some studies have shown that severely obese individuals are likely to die on average 11 years earlier than those with a healthy weight, although this figure can vary depending on an individual's circumstances." (Department of Health 2010). The Government Office for Science provides a view of the expected trends in obesity (Government Office for Science 2007). Their predictions suggest that rates of obesity will double by 2050 if no action is taken and this progression can be seen in the chart below. (Government Office for Science 2007)

Chart showing predicted trends in Obesity Rates for England (Courtesy of Shedding the Pounds, Office of Health Economics 2010)



Source: Government Office for Science

Tackling obesity is therefore important not only for individual health but also for the health of communities and economies, and helping to manage the overall healthcare budget and functioning of the healthcare system.

OBESITY STRATEGY

An International Obesity Taskforce (IOTF) is working hard together with the World Health Organisation (WHO) to develop a variety of exercise and physical activity initiatives such as the 'WHO 3 Fives campaign', Change4Life (DOH), and the National Institute of aging.

The DOH (UK) has published an obesity strategy clearly supporting health communities, patients and the public in reducing the burden of obesity to 2000 levels. The Government's ambition is to be the first major nation to reverse the rising tide of obesity and overweight in the population, by enabling everyone to achieve and maintain a healthy weight. The initial focus is on children: By 2020, we aim to reduce the proportion of overweight and obese children to 2000 levels. The Healthy weight, Healthy lives strategy: Progress report (DOH 2010) clearly defines the role of exercise in reducing obesity and encouraging the public to make healthy lifestyle choices.

SUCH STRATEGIES INCLUDE:

- Modifying the design of buildings to encourage stair use
- Examining urban design to facilitate walking in safer neighbourhoods
- Promoting active transport by providing a more integrated network of footpaths and bicycle lanes and developing an understanding of healthy transport networks which help maintain exercise
- Improving food labelling to help customers make informed choices
- Increasing the range of Healthy foods in schools, work places and restaurants
- Developing successful Exercise Referral schemes and encouraging Health professionals to see exercise as a 'vital sign' as part of the 'Exercise is Medicine' strategy in the USA

It is therefore essential that all health professionals review patients lifestyles, medicine use and how many times they exercise a week, and how they incorporate exercise into their daily lives to prevent obesity.

There are many factors that contribute to obesity:

- Activity- Increases in passive leisure pursuits, labour saving devices, more car travel, changes in working practice, progressive physical inactivity across the age range
- Smoking cessation- dietary and exercise advice lacking due to smoking cessation
- Nutrition- changes in energy intake, increases in the availability of certain processed foods, increased marketing campaigns, changes in eating patterns, changes in diet composition, increased consumption of alcohol
- Socio-economic status- Obesity is linked to social deprivation but the relationship is complex
- Genetic and Metabolic- Our genetic make-up appears to predispose some individuals to developing obesity, endocrine disorders are rare causes of weight gain, drug treatment (tricyclic antidepressants, sulphonylureas for diabetes, some steroidal contraceptives and corticosteroid therapy for a variety of conditions, and valproate in epilepsy may contribute to weight gain.
- Biological- Pregnancy, Age, Gender, Race

Figure Deaths associated with obesity will mean that this will become the biggest cause of mortality across populations and other diseases (This is not the correct way to measure BMI!)



There are many complications of weight gain and obesity that also contribute to patients' poor health status:

- Type 2 Diabetes
- Stroke: as a result of hypertension
- Hyper lipidaemia and a low cholesterol rise
- Gall stones, especially in women
- CHD related to increased lipids and hypertension
- Increased Blood pressure
- Cancers- postmenopausal, endometrial, ovarian gall bladder, and colon cancer
- Breathlessness, respiratory disease, sleep apnea
- Menstrual abnormalities and hirsutism
- Pregnancy complications: increased risk of neural tube defects, perinatal mortality, hypertension, toxæmia, gestational diabetes, preterm labour, Caesarean section and hospitalisation
- Weight related musculo-skeletal disorders and arthritis with back, joint and foot disorders

Regular exercise helps to reduce the effects of these co-existing factors, and its fun and promotes self esteem and health and well being.

Pharmacists and pharmacy health professionals are in a unique position to advise patients who are at risk of becoming obese as a result of the factors described, and to offer active weight management advice and particularly exercise advice.

THE RATIONALE FOR EXERCISE IN OBESITY

Regular exercise is a simple and useful lifestyle measure to help prevent the development of excessive body fat content and to lose weight in cases of overweight and moderate obesity. It has also been shown to be an important adjunct therapy in the treatment of severe obesity.

Specific benefits for exercise for overweight and obese clients include:

- Increase total energy expenditure
- Increasing resting metabolic rate (which accounts for approximately 60-70% of total daily energy expenditure in a sedentary human)
- Promotes body fat metabolism whilst preserving lean mass
- Possible reversal of the diet -induced suppression of BMR
- Decreases other CHD risk factors associated with obesity:
 - Improved blood sugar control and increased insulin sensitivity (decreased insulin resistance)
 - Reduced triglyceride levels and increased "good" HDL cholesterol levels
 - Lowered blood pressure
 - A reduction in abdominal fat
 - Reduced risk of heart disease
- Benefits of exercise as a whole, improved cardiac, respiratory, cognitive and skeletal function, and improved self esteem, and sense of well being. Exercise also enables reduction in stress levels, better quality sleep and concentration.

Obese individuals may be limited in their ability to achieve weight loss as a result of physical activity, and evidence suggests that diet modification and exercise enable significant weight loss when combined with behavioural support (Sign guideline 2010) (24).

Pharmacists and pharmacy technicians when encouraging an obese client to exercise, as part of a structured weight loss program can emphasis the following:

The fitter the patient becomes the more efficient their body becomes at utilising a greater proportion of fat as fuel for exercise.

As their fitness improves they will be able to exercise at a higher intensity and for longer period before becoming fatigued and thus expend more energy.

Evidence suggests (SIGN 1996) that a 10kg weight loss gives patients significant health and fitness benefits:

- >20% reduction in total mortality
- >30% reduction in diabetes-related deaths
- >40% reduction in obesity related cancer deaths
- >10mm Hg reduction in systolic blood pressure
- >20mm Hg reduction in diastolic blood pressure
- 50% reduction in fasting glucose
- 10% reduction in total cholesterol
- 15% reduction in LDL
- 8% increase in HDL
- 30% reduction in triglycerides
- Reduced sleep apnoea
- Decreased breathlessness
- Improved ovarian function in polycystic ovarian disease

CONTRAINDICATIONS TO EXERCISE IN OBESITY

Obesity patients require special considerations and motivational support when exercising:

- Co-morbidities eg Diabetes, must be assessed and appropriate exercises planned to ensure maximum cardiovascular benefit and safety
- High impact activities should be avoided as this deters patient's compliance but also increases the risk of injury
- Full weight bearing activities for the very obese should be avoided to prevent injury
- Obesity can cause problems in temperature regulation and care should be taken that the environment and patient is suited to the exercise, and fluids should be freely available throughout the training session
- Safety considerations include:
 - Teaching patients to monitor their own exercise activity through the RPE scale or talk test to enable patients more control of their exercise with or without a health professional

- Ensuring patients who are new to exercise are encouraged to wear adequately supportive, shock absorbing footwear and suitable sweat resistant clothing for hygiene purposes

Besides the obvious challenges of being overweight or obese, when it comes to exercise, patients have even more obstacles and safety issues getting in their way. Patients often see the barriers to exercise as:

Intimidation at the gym: Gyms can be scary even for the most experienced exerciser. Walking into a room full of sweaty exercisers, all of whom seem to know what they're doing, is hard for many of patients. Obese patients often feel humiliated when they're very overweight: Personal training in a separate studio or outdoor area is sometimes preferable, until weight loss is achieved. Positioning the CV equipment away from mirrors and in less competitive areas of the gym is helpful for some patients, and ensuring that the patients are comfortable with the time slots, to ensure maximum compliance in the activity. An obese patient may prefer to avoid the gym at busy times, and choose certain gym equipment for ease and dignity of use.

Confusion about cardio: Cardio exercise can be a challenge at a gym. Some of the problems these patients face include:

- Some machines are difficult to use or can cause knee or back problems- so machine use should be chosen with care. Prior consideration should be given to weight restrictions on exercise equipment.
- Swimming is a recommended exercise for obese people, walking around in a bathing suit causes instant panic for plenty of people, but even more so if patients are overweight or obese
- Recumbent bikes are another good option for obese people. The problem is, many aren't built with big enough seats, and climbing onto them can be a real challenge- but some gyms do specialise in the management of obese patients

Obese patients exercising and managing their calorie intake, and incorporating healthier lifestyle changes will still need regular supervision and motivation from their health professional and GP/Consultant.

Health Professionals, and particularly Pharmacists and pharmacy technicians can advise obese patients to exercise and contact their GP and Consultant for treatment and advice on obesity management.

Exercise Recommendations in Obesity		Rationale
Type of exercise	Fit	
<p>Using large muscle groups in non-weight bearing or low impact weight bearing activities including cycling, swimming and walking.</p> <p>Initially, assess patients fitness levels and recommend increasing aerobic activity in 5 minute intervals</p> 	<p>F 5-7 days per week I 55-69% HR max T At least 30 minutes</p> <p>Aim is to progress to 45-60 minute/day or 200-300 min/week In practice the starting fitness level and degree of obesity will dictate the duration of exercise that an individual can accomplish.</p> 	<p>The focus of exercise prescription for obese clients is to increase their energy expenditure but the optimal means to achieving this are unclear Exercise for the obese patient should be motivating, fun and above all at sufficient intensity to achieve the desired weight loss. Encouraging patients to incorporate professional dietary advice and behavioural support is essential in obesity management. Higher intensity training for patients with (Boot camp intensive cardio and Interval training) is more beneficial at increasing total energy expenditure and has been shown to be more efficient in inducing weight and fat loss.</p>

Exercise Recommendations in Obesity		
Type of exercise	Fit	Rationale
<p>Resistance Training</p> <p>Creative and fun exercises should be developed to maintain the patients motivation and achieving goals</p>	<p>F 2-3 sessions per week I 10-15 repetitions T 1-3 sets</p> <p>Aim is to progress to 45-60 minute/day or 200-300 min/week</p> <p>In practice the starting fitness level and degree of obesity will dictate the duration of exercise that an individual can accomplish.</p>	<p>Evidence that resistance training improves outcomes in diabetes patients. Important component of exercise is to maintain lean body weight</p>
<p>Flexibility</p> <p>Floor exercises should be encouraged to enable obese patients to gain confidence in getting up and down on the floor unaided</p>	<p>The ACSM recommends flexibility training a minimum 2 to 3 days per week holding each stretch for 10 to 30 seconds to mild discomfort; 3 to 4 repetitions per stretch. On a PNF stretches ACSM suggests a contract 6 seconds followed by a 10 to 30 second assisted stretch.</p>	