A study of weight loss maintenance using email support

by

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Statement of Originality

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ABSTRACT

Background
Weight loss maintenance is a crucial element of effective weight management. Professional face to face contact is known to be beneficial but costly in terms of manpower in supporting weight maintenance. In the USA, the use of the internet to maintain contact and motivation with clients has been explored. This study seeks to investigate the benefits to weight maintenance of dietetic support via email with a group of successful weight loss patients from a National Health Service Dietetic Clinic.

The principal aim:
Assess whether the effects of dietetic support through the medium of email on weight loss maintenance in individuals who have been successful in weight loss are beneficial.

The specific objectives are:

• To compare over a six month period, in individuals who have achieved similar weight loss, whether maintenance of weight loss differs in individuals who have access to dietetic support via email compared to those who do not.
• To identify by means of a questionnaire which factors either encourage or inhibit self-management of weight maintenance (consumption of breakfast, amount of fruit and vegetables eaten, eating a low fat diet, frequency of self monitoring of body weight, undertaking regular exercise) in participants who have successfully completed an NHS weight loss programme.
• To conduct interviews to assess the personal experience of using a remote communication method (email) between participant and professional.

The apriori hypothesis to be tested:
That in patients who were obese and have achieved a weight loss of >5% of their initial body weight, there will be a significant difference in weight loss maintenance in those who, following the weight loss period, have maintained contact with a dietitian through email compared to those who have no contact.

Method
Fifty-five patients who had lost ≥5 % body weight were assigned to either an intervention group (weekly email messages and monthly personal email message) or a standard care control group. After 6 months the level of weight maintenance, dieting and exercise behaviours, were recorded in both groups and analysed using parametric or non parametric tests.

Results
A significant number of participants in the intervention group maintained a clinically beneficial percentage weight loss (p = 0.05) however, there was no statistical
difference between the two groups in terms of absolute weight loss maintenance. Therefore the hypothesis was not proven. However, the control group regained weight lost at a significantly greater velocity ($p = 0.02$) than the intervention group. There were correlations between the amount of fruits and vegetables eaten and exercise episodes against weight change in maintenance.

**Conclusion**

This is a unique study within the United Kingdom as it uses dietetic support in weight loss maintenance within the NHS. It shows that remote dietetic support using email can be used effectively to assist in maintenance of percentage weight loss and reduce weight regain velocity. Behavioural targets including eating fruits and vegetables, regular breakfast eating and undertaking exercise are shown to be beneficial in maintaining weight. The study produced a low attrition rate (6/55) which reflects the relationship with the researcher. It illustrates the benefit of developing self efficacy and introducing the theoretical basis of social cognitive theory. Further research into this new way of working is encouraged using a larger cohort across multi-centres for a longer period of time.

**Key words**

Weight loss; dietitian; email contact; maintenance; controlled trial
Dedication

To Royston Morse Hodge
A wonderful father, who was taken too soon
1921 - 1989
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<td>BMI</td>
<td>Body Mass Index</td>
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<td>BNF</td>
<td>British Nutrition Foundation</td>
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<td>DH</td>
<td>Department of Health</td>
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<tr>
<td>DPP</td>
<td>Diabetes Prevention Programme</td>
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<td>g</td>
<td>Gramme</td>
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<tr>
<td>GP</td>
<td>General Practitioner</td>
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<td>IHCA</td>
<td>Interactive Health Communication Application</td>
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<td>IPHIS</td>
<td>Isle of Wight and Portsmouth Health Information Service</td>
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<td>IT</td>
<td>Information Technology</td>
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<td>Kcal</td>
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<td>MJ</td>
<td>Mega Joules</td>
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<tr>
<td>NHS</td>
<td>National Health Service</td>
</tr>
<tr>
<td>NICE</td>
<td>National Institute of Clinical Excellence</td>
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<td>NIH</td>
<td>National Institute for Health</td>
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<tr>
<td>NWCR</td>
<td>National Weight Control Registry</td>
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<tr>
<td>OFCOM</td>
<td>Office of Communications</td>
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<tr>
<td>RCT</td>
<td>Randomised Controlled Trial</td>
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<tr>
<td>SCT</td>
<td>Social Cognitive Theory</td>
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<tr>
<td>SPHO</td>
<td>Scottish Public Health Observatory</td>
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<td>UK</td>
<td>United Kingdom</td>
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<tr>
<td>USA</td>
<td>United States of America</td>
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<tr>
<td>WHO</td>
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Chapter 1: Introduction
The “Choosing Health” White Paper was launched by the Department of Health in October 2004. It was a key policy document in the public health strategy of the Labour Government and a long awaited start to the Government’s approach for management of the rising rates of obesity. A review of the “Choosing Health” Policy showed that this public health strategy was the accumulation of almost ten years of analysis and debate by various statutory bodies and that it highlighted the increasing incidence of obesity and the impact that this will have on society (Thomas, 2005).

1.1 Incidence, Prevalence and Risks of Obesity
The incidence and prevalence of obesity in the United Kingdom are both rising. Incidence defines the rate by which new events of obesity occur in the population within a specified time period; whereas the prevalence details the number of obese persons in the population at one time. Over the past 25 years the prevalence of obesity has increased significantly. In 1980, only 6% of men and 8% women were categorised as obese, whereas in 2005, 65% of males and 55% of females were overweight and obese which includes 22% being classified as obese (defined by a Body Mass Index (BMI) of >30kg/m$^2$ ) with little difference between gender (Information Centre, 2006)). Body Mass Index (BMI) is a definition of body weight in relation to height and categorises individual body weight in terms of underweight, normal, overweight or obese. Overweight is defined as BMI 25–30kg/m$^2$ and obesity as BMI >30kg/m$^2$ (World Health Organisation (WHO), 2003).

The recent trends of increased consumption of nutrient-poor, foods which are nonetheless energy dense, with the majority of energy being contributed by saturated fats and simple sugars, combined with a reduction in the amount of physical activity undertaken on a regular basis, have led to the incidence of obesity rising three fold in the last 26 years (DH, 2004).
This rise is predicted to continue and it is estimated that by 2010 around 6.6 million men will become obese, an increase from 4.3 million in 2003. For women, it is estimated that 6.2 million women will become obese in 2010, whereas in 2003 the figure was just under 5 million (DH, 2006). The data used in this Department of Health document utilised the trends of increasing numbers of those registering as obese (as per BMI definition) within Primary Care from 1993 to 2003. During this period there was a large increase in the incidence of obesity in men. In England, the proportion of men classed as obese increased from 13.2 per cent in 1993 to 23.1 per cent in 2005. The comparable figures for women were 16.4 per cent and 24.8 per cent, therefore the 10 percent increase in the incidence of obesity in men, compared to only a 7 percent increase for women, has fuelled the prediction that the prevalence of obesity in men will be higher than in women, if the trend does not go unchecked (Information Centre, 2006). The Government's Office for Science 'Foresight' (2007) suggests that without clear action, the incidence will rise to 60 % of men, 50% of women and 25% children being obese by 2050, with a further 35% of adults registering as overweight on the current BMI scale. This will cost the UK economy £45.5 billion a year. The percentage of National Health Service (NHS) costs arising from elevated BMI levels are predicted to increase from 6% in 2007 to 13.9% in 2050 (assuming unit costs remain the same). Therefore, they liken the problem to climate change in that every branch of society has to take action to prevent overwhelming financial and societal burden. The trends of obesity apply across society; obese individuals are present in all socio-economic groups, although they are represented to a lesser extent among the most affluent women.

The rising rates of obesity are partly due to the increased trend towards convenient foods, larger portion sizes and decreased activity. Cheaper cars for personal transport and many different types of mechanical and electrical equipment about the
home and work have reduced physical activity. The use of computers and television has increased the lack of physical exertion that occurs for most adults and children across Western Societies (James, 2008). Regular meals have now given way to ‘grazing’, with a huge range of highly energy dense products providing appetising, quick to cook and eat foods, which dominate supermarkets.

The cost per annum of treating obesity in the UK currently has been estimated between £45.8 and £49 millions; with a further £1,075 millions per annum spent on treating the co-morbidities of obesity (National Audit Office, 2001; Information Centre, 2006). Effective treatment for those with weight problems is a priority for the health service and government because of the cost implications of the co-morbidities associated with obesity. Obesity poses a major risk for the development of serious, diet-related, chronic diseases including type 2 diabetes, cardiovascular disease, hypertension and stroke. There are also non-fatal but debilitating health problems associated with obesity including respiratory difficulties, chronic musculo-skeletal problems and infertility (National Institute of Clinical Excellence (NICE), 2006). Adults with a BMI >40kg/m² are at a higher risk of developing Type 2 diabetes, hypertension, hypercholesterolaemia, increased risk of cardiovascular disease, cancer, asthma, arthritis and overall poor health (Mokdad et al, 2003). The incidence of type 2 diabetes is 80 times more in the obese population and the presence of obesity increases the predisposition for hypertension by 2 – 3 times (Foresight, 2007).

The White Paper “Choosing Health” (DH, 2004) highlighted the need for effective prevention of obesity and treatment programmes for weight management. The National Institute of Clinical Excellence guidance (NICE, 2006) stated that managing obesity is a priority for all public agencies and as such has directed the N H S to develop ways of treating and preventing the problem.
The World Health Organisation (WHO) suggested that effective weight management should include; prevention, weight maintenance, management of co-morbidities and weight loss. Supporting healthy behaviours with diet and exercise is crucial (WHO, 2003).

1.2 The Impact on Dietetics
In 2006, the National Institute for Clinical Excellence produced Report 43 on the prevention, identification, assessment and management of overweight and obesity in children and adults. This report clearly stated that health professionals, especially those in primary care, should ensure that management of obesity is a priority at both strategic and delivery levels. Dedicated resources should be allocated for action. The clinical care pathway puts diet as one of the two main points of management (the other being increased activity). The report also recommended the use of health professionals who understand the role of behaviour change and have accurate knowledge of nutrition and diet. Dietitians were placed at the heart of the obesity task force in the 1999 report by the British Nutrition Foundation (BNF) and the “Choosing Health” Policy (DH 2004). They remain the largest group of health professionals, who are qualified in nutrition and diet and as such are dedicated to obesity management within the NHS.

The effect of the rising rates of obesity is seen very clearly in the referral patterns to local dietetic services within the National Health Service. In 2005, a dietetic department in a district general hospital of an NHS Trust on the south coast of England was experiencing significant challenges as a result of local resource issues. The Trust is the largest non-teaching acute trust in the United Kingdom (UK) and the tenth largest trust overall in the country. It serves a population of 550,000 and covers two social regeneration areas, which coincides with two of the three vascular inequality areas of the county. The resource pressures were partly relieved by the
establishment of a dedicated Weight Loss Clinic run by one dietitian. This clinic was used as a service development project for the purpose of the award of Doctorate of Clinical Practice and the subsequent audit and analysis of change management in developing the clinic showed that results obtained for weight loss through this clinic were significantly better than the traditional outpatient treatment (Thomas, 2006). However, the increasing volume of work being presented to a successful treatment model accelerated the need to address long term management of obesity and service development in a resource-strapped NHS. The NICE guidance on obesity (2006), stated that the challenge is to ensure that those who lose weight will maintain that weight loss. The recommendations of the BNF (1999), which until the publication of the NICE guidance was a formative document in obesity management, stated that achieving weight loss is just one part of the obesity management problem; addressing the issues of weight loss maintenance is essential.

The Weight Loss Clinic showed that individuals could achieve a meaningful weight loss target within a discrete period of time. Clients relate positively to the dietitian (Jones, et al., 2007; Thomas, 2006) so that moving individuals on and discharging them from active care is a challenge. The Weight Loss Clinic has demonstrated the positive effect of behaviour change. The theory of behavioural maintenance shows that relapse is a normal occurrence (Prochaska and DiClemente, 1989; Bandura, 1986) and that preparation for relapse is a vital component of change management. In relation to weight loss, relapse of behaviour change produces weight regain and as such reduces the efficacy of weight loss. The social cognitive theory of Bandura (1997) provides evidence of supporting ways of managing weight loss maintenance. He suggested that social support is beneficial in managing relapse. Social support can be provided by many individuals close to the patient; however if the patient
wishes to have professional contact, it would be interesting to see if this could be achieved and still be economically viable, especially in the National Health Service. Hill et al., (2005) suggested that dietitians should be the main focus of weight management; approaching the problem through tackling the three goals of: preventing weight gain, producing weight loss and maintaining weight loss. It has been demonstrated that the weight loss clinic produced the first two goals; however, this thesis investigates the possibility of it producing the third.

1.3 The Study
In section 4 of the guidance, the NICE recommendations (2006:p420) state that 'there is some evidence that computer/email/internet-based programmes accompanied by greater on-going support – in person, by post or email may be more effective than those without support'. The service development project patient questionnaire revealed that 74% of patients attending the dietetic clinic had access to email (Thomas, 2006). Therefore email was a means of continuing contact would give access to a large proportion of patients using minimal professional time. The use of internet based communication provides opportunities for interactivity, ease of access, anonymity and a reduction in travel barriers (Womble et al., 2004).

The results of the initial literature review demonstrated that the possibility of helping individuals who have been successful in weight loss to maintain that weight loss would be of clinical significance. It also considered the issue of providing some professional support when individuals have achieved benefit through their weight loss and can be discharged from active treatment. This ensures a 'throughput' in treatment programmes, achieving a process by which small professional services can address the increasing numbers of obese individuals. Studies that had been undertaken primarily in the United States of America (USA) showed some indication of the benefits of Internet support to successful dieters. However, there was
indication that ‘a more personalised approach’ was required and so, a study investigating the use of electronic support from a dietitian (by email) to successful weight loss patients seemed to be the gap in the knowledge, both in the U.S.A and the U.K.

A randomised controlled trial was considered to be the most beneficial means by which this process could be tested for effectiveness. The aim was to assess whether having professional contact with a dietitian by email would benefit weight loss maintenance. This is a positivist paradigm, resulting in the findings of the research showing what happens in reality. It is hoped that the findings can be applied to the wider world of dietetics and be of benefit to the NHS.

The study presented here centres on patients who had lost weight to a level of ≥5% of initial body weight, through attendance at a dietitian-led NHS outpatient clinic taking patients referred mainly from Primary Care. All patients who had email access were asked if they were interested in the study and recruitment proceeded accordingly. All participants had their own eating and activity plan, specific to their own weight management. A weight management card was provided, illustrating the 4kg weight band within which participants were asked to maintain their weight over the next six months. Information was provided on weighing and recording body weight regularly. The intervention arm of the study received 6 months of weekly email messages based on weight management information. Each month, participants in the intervention group received a personal email message asking what their monthly weight was and whether they were managing to keep within their personal weight band, which was 2kg either side of their weight at the start of the intervention. Similarly to the intervention group the control arm of the study was also taught how to manage their weight and maintain it within the weight band prior to randomisation but received no email contact during the six month study period.
At the end of the study period, participants from each group met with the researcher individually in an outpatient clinic, to assess weight management and determine how each person had found the intervening six months.

A quantitative and qualitative analysis was undertaken of the results. The results were discussed and interpreted in relation to the hypothesis put forward, the literature currently available on the topic of weight loss maintenance and the use of email as professional support.

The overarching aim of this study is to assess whether this method of dietetic contact can benefit individuals in maintaining an achieved weight loss which was great enough to be clinically beneficial.

1.4 Overview of Chapters
The thesis comprises of a further 6 chapters.

Chapter 2 provides the details and the results of the literature searches conducted. The chapter explains the evidence for dietetic involvement in the management of obesity, including the aims of dietary treatment, weight loss goals and weight loss maintenance programmes. The role of the dietitian is considered in the dietary management as well as the role in the relationship with the patient and development of behaviour change. The use of the Internet for health care is discussed and the specific role it has in weight loss management. The theoretical framework that supports behaviour change and the domains of weight loss maintenance is considered, plus models of relapse. Gaps in the literature are illustrated to develop the design of the study.

Chapter 3 describes the methodology applied to the research proposal. Consideration of the ethical issues and the management of the process of the study are described. Full description of the preparation for maintenance of the weight loss
is given. A diagrammatic explanation of the participant flow through the study is provided. An explanation of the process of the research study is given, including the analysis of the results both quantitative and qualitative.

Chapter 4 presents the results of the study. This is divided into two halves: the quantitative results and the qualitative results. The quantitative presents the demographics of the participants in the study and the results of either intervention or control groups to be able to maintain their weight loss over the study period.

Further analysis of the behaviours utilised to assist weight loss maintenance and the effort taken to undertake these activities, is made for the whole group of participants.

Within the qualitative section, consideration is given to the attitudes of participants to the intervention used (email) and to the issues that affect all participants in managing their weight loss.

Chapter 5 discusses the results obtained from the study and whether the hypothesis has been proven. Full consideration of the clinical benefit of the study is made and the larger effect that this might have. From the qualitative results consideration is made to assess whether there is evidence in the study of the theoretical framework as described in the literature review.

Chapter 6 provides ideas for the further development of the study and the impact of remote electronic contact in healthcare.
Chapter 2: Literature Review

2.1 Introduction
As obesity is the major public health crisis facing the World today, there is a great deal of research into different aspects of the condition. Aetiology, pathogenesis, secondary affects of obesity, life expectancy, treatment (dietary, pharmacotherapy, psychotherapy, exercise, and surgery), behaviour change, maintenance of behaviours and weight loss etc., are all large topics in themselves. This chapter seeks to investigate knowledge that links weight loss, dietetic involvement, maintenance of weight loss and use of the internet in obesity management. From consideration of that literature various themes will be discussed to formulate the research idea.

2.2 Literature Search
See appendix A for details of the literature search. Due to the lack of homogeneity between studies it was not possible to conduct a systematic review or meta-analysis. Therefore, a narrative review was completed.

Grey literature was obtained throughout the time of the study through various conferences and literature obtained via the National Health Service.

All research papers were read and listed for their contribution to the knowledge surrounding and establishing the development of the research idea. Analyses of the papers revealed the following themes and are discussed in turn throughout this chapter: dietary treatment, weight loss and maintenance, role of the dietitian, use of the internet and other remote systems in weight loss control as well as behaviour change theories applicable to maintenance of weight loss.
2.3 Treatment

2.3.1. Aims of Treatment
When treating obesity, the goal is to establish healthy behaviours to reduce body weight and then maintain it at the lower level to reduce the risk of developing comorbidities. Essentially, a negative energy balance needs to be achieved and maintained over a long period of time to enable body fat to be utilised as an energy source and thus reduce body weight. There is a selection of methods to do this, whether by decreasing energy intake, increasing energy expenditure (by activity) or a combination of both. NICE (2006) suggested that weight management programmes should include behaviour change strategies to increase physical activity, improve eating behaviour and improve the quality of the diet and decrease energy intake. The treatment options can be divided into different strategies:

- dietary modification
- increasing physical activity
- counselling or cognitive behavioural therapy
- pharmacotherapy
- surgery
- or a combination of several of these approaches

In the UK, the majority of dietetic treatments involve using a combination of dietary modification and increased physical activity with patient consultations being individual, although some NHS departments offer group treatment led by either dietitians or healthcare staff that may have been trained by dietitians. There are only a few NHS specialist obesity clinics in the UK and access to them is restricted, purely through the numbers of obese people requiring treatment against the number of obesity clinics available. NICE has published guidance on the treatment of overweight and obesity in adults and children (NICE, 2006). This review by the
National Institute is unusual in that for the first time the recommendations are not purely aimed at the NHS, recognising that obesity is an issue for all areas of life. Recommendations are given for action by employers, schools etc.

Section 15 in the guidance concentrates on the clinical management of obesity in adults. As with all reviews of the literature there are limitations due to the mixed nature of the type of intervention, clinical settings, style of intervention and baseline characteristics. They reviewed all randomised controlled trials of dietary interventions in adults with a BMI greater than 28. The trials were for 12 months duration and the outcomes were a weight change at the end of the 12 months. As will be seen from literature presented later in this chapter, 12 months is a relatively brief period of time for consideration of the benefits of weight management. From this they suggest that:

- Dietary advice should be individualised, tailored to food preferences and there should be flexibility in the methods used to reduce energy intake.
- Restrictive and nutritionally unbalanced diets should not be used as they are ineffective in the long term and can be harmful.
- For sustained and sustainable weight loss, diets that have a 600 kcal/day deficit or which reduce energy intake through lowering the fat content or do both, with expert help and intensive follow up are the optimum treatment.

The recommendations of the BNF Task Force on Obesity (BNF, 1999) stated that those employed to treat obese people should focus on five strategies for the treatment and management of the condition:

- obese individuals should be aware of the risks associated with their weight
- choosing a treatment mode applicable to the individual
- competent health care staff to review progress regularly
• look to long-term treatment and realistic goals
• provision of an after-weight-loss service.

These are similar to the NICE guidance produced some seven years later. However the BNF was aiming its recommendations at a clinical group whereas as, mentioned before, the NICE guidance on obesity is aimed at all public agencies. Therefore obesity management and prevention is seen as a role for all rather than just health care professionals. However the treatment plan, goal setting and risk management in the NICE guidance is the same as quoted by the BNF in 1999.

2.3.2. Current Dietary Treatment
In the NHS, obese people are treated using a manipulation of the energy equation:

\[
\text{Energy Intake} < \text{Energy Expenditure} = \text{Weight Loss}
\]

Within the NHS, it is commonly dietitians who undertake the role of manipulation of energy intake in the first part of the equation; there are a few areas where exercise therapists are available to facilitate an increase in activity. Weight loss programmes within the NHS run as either individual or group treatments that focus on a reduction of the total energy consumed. The majority of the workload of registered dietitians working within the NHS is treatment of obesity alone or with a co-morbid condition (Thomas, 2006; Garrow and Summerbell, 2000). Treatment generally takes place in Primary Care with few areas nationally having access to specialist obesity clinics situated in secondary care. Patients are treated using the 'stage of change model' as described by Rollnick (1996) based on the work of Prochaska and DiClemente (1989), where the patient sets their own goals for change after discussion about their problems with a health professional. The diet is based on the National Food Guide (Hunt et al., 1995). Due to the numbers of patients being seen, follow up can often be delayed and frequent contact between professional (whether dietitian or nurse) and the patient can be haphazard (Thomas, 2006). Eyton (1987) reported
that the motivation to continue with treatment is for the client to experience weight loss. Therefore, patchy support and erratic weight loss may affect long term results. Duration of treatment is often less than one year and patients may have been seen infrequently during that time (Thomas, 2006). Results in terms of absolute weight loss can therefore be disappointing when treatment duration is brief (McQueen et al., 1999).

For this reason, Perri and Corsica (2002) have argued that obesity should be viewed as a chronic condition and that patients require long-term care, with treatment guidelines being the same as for the management of diabetes.

2.3.3. Energy Restriction
Dietary energy restriction, as a tool for inducing weight loss, is highly effective in obesity treatment. A mean loss of body weight of 10 – 15kg can be achieved over 6 months with a diet providing a 500kcal/day reduction of habitual intake (Garrow and Webster, 1989). Establishment of an energy restricted, nutrient balanced diet is essential for long term dietary change, which will produce weight loss and then maintain that degree of weight loss.

Most obese people will not have attained their ideal weight when initial treatment ends. This needs to be discussed with individuals at an early stage of the process, as cessation of treatment before ideal weight is achieved can leave the person with a feeling of failure, which may result in relapse (Wolfe, 1992). Pursuing further weight loss or maintaining what has been accomplished is a choice that has to be made by the individual. Brownell and Stunkard (2002) suggested the latter is more feasible, as a weight loss of >5% can produce health benefits and can be achieved in a discrete period of time (Frost et al., 2003) which is generally before or at six months (Wadden and Osei, 2004).
2.3.4. Dietary Treatment
A systematic review of dietary treatment by Avenell et al., (2004) showed that the use of a low fat diet is associated with a greater weight loss over three years than other treatments. However, the number of studies comparing the effect in the long-term of very low calorie diets (< 4.2 MJ or 1,000kcal/ per day), low calorie (5 MJ or 1,200kcal – 6.3MJ or 1,500kcal per day), or low fat diets was small, the authors suggested that very low calorie diets produce the greater weight loss. Therefore, they suggested that the evidence on which to base dietary recommendations for obese adults is limited, but suggests that low fat diets are the most effective over a period of time as very low calorie diets are hard to maintain for significantly longer periods. Low calorie diets (4.2 MJ – 6.3MJ/day), very low calorie diet (under 4.2 MJ/day) and protein sparing modified fast diets (carbohydrate content less than 40g per day) are more likely to be used with people of BMI >40 kg/m². It has been indicated that the greater initial weight loss produced by these diets may improve long term weight loss in this group (Astrup and Rossner, 2000); however, long term use of these diets is limited due to their extreme nature and the difficulty in adhering to them for any length of time. Despite this, Dansinger et al., (2007) showed that the lower energy intake per day, as well as more frequent support meetings and the absence of diabetes were independent predictors of greater weight loss.

2.4 Weight Loss
2.4.1. Weight Loss Goals
The concept of modest weight loss is often difficult for professionals to accept. Achievement of normal or ideal body weight is not a necessary goal in the management of obesity and is rarely reached in practice (Wilding, 2007). However, it is now recognised that modest weight loss of between 5–10% initial body weight is associated with reduction in health risk, e.g. reduction in blood pressure, fasting blood glucose, as well as producing immediate benefits to the individual's sense of
well-being, self esteem and quality of sleep (Goldstein, 1992). This level of weight loss as a goal is more achievable than aiming to lose enough weight to reach a normal BMI, which in some obese people could equate to losing 20 – 30% of present body weight. Many obese people embarking on a weight loss programme with a goal of achieving a weight loss equivalent to 10% of their initial weight, may even if successful, still have a BMI that registers them as obese and this can be viewed negatively (Foster et al., 1997). Nonetheless the benefits of a 10% weight reduction with sustained maintenance of that weight loss are clinically significant and it is still a desirable outcome of treatment. Comprehensive programmes of lifestyle modification will aim to achieve 10% weight loss in 16 – 26 weeks (Knowler et al., 2002). However, a meta-analysis of dietary counselling for weight loss showed the mean net treatment effect of approximately 6% of initial body weight or 2 BMI units (5kg) weight loss occurs by 1 year when compared to usual care and this effect narrows at the end of 4 years. (Dansinger et al., 2007). They report that half the initial weight loss was regained within three years. This equates to 3% of the initial weight loss maintained and as such reduces the beneficial effect of having lost 6% of body weight.

The Diabetes Prevention Programme (DPP) (Knowler et al., 2002) showed the health benefits for modest weight loss, including a reduction in diabetes symptoms and high blood pressure. In this study (DPP) individuals lost on average 7% of initial body weight by the end of the first year but regained weight to a level of 5% of initial weight loss over the next three years. The ability to achieve the weight loss is well documented; it is the preservation of this weight loss that is required to maintain health benefit. However, Wadden et al., (2004) suggest that it is better to have lost and regained than never to have lost at all, as the benefit of the initial weight loss will bring a reduction in health risk which is only lost when all the weight is regained.
This is supported by Wilding (2007) who stated that for some patients, preventing weight gain may be a reasonable aim of treatment. If, for example a patient lost 15% of their initial body weight and then regained that weight loss within one year, the benefit to their health status is nil. However during the process there has been benefit to the individual from the weight loss and it has also prevented a period of further weight gain during the time that weight was being lost and the initial period of weight gain.

2.4.2. Weight Loss Clinic
Results of a local Weight Loss Clinic (WLC) managed by the researcher in a general hospital on the South Coast (as described in section 1.2), has in the last four years achieved results of a mean weight loss of 3.2kg; mean 6% weight loss (4.4kg in high attendees) this compares favourably with those listed in section 2.5.1. (Thomas, 2006). The WLC operates twice weekly, is dietetic led only and patients are referred by medical practitioners and meet a BMI referral criteria of ≥30, all requiring treatment for obesity. They may or may not have a co-morbid condition such as type 2 diabetes. Each patient is invited to phone the dietetic department to make an appointment, therefore they are self-selecting treatment. The clinic (two per week) is run by the same dietitian (the researcher) weekly. All patients are given regular follow up appointments, usually within four – five weeks, the design being similar to that used by Munelly and Feehan (2002) but, unlike them, providing a full dietetic consultation every month rather than the weigh-in on a weekly basis. As a service the dietetic team are not allowed to prescribe weight loss medication. Attrition rates are lower than for the normal dietetic clinics (11.6% compared to 14.6% for initial appointments, falling to 7.8% – 27.3% for subsequent appointments) (Thomas, 2006) and the rate of 69% quoted by Taylor et al., (2003).
Over the financial year (April 05 – March 06, Thomas, 2006), 84 patients were introduced into the WLC. Their average weight loss was 4.4kg which was 6.6% of initial body weight over 6 months. This weight loss was achieved within five contacts with the dietitian, taking approximately 24 weeks. However, this rate of weight loss is lower than that quoted by Taylor et al., (2003) who achieved weight loss of 4 – 6kg over a 12 week period and lower than the rates quoted by Frost et al., (2002) who achieved in their Lifestyle Clinic, over six months, a mean loss of 7.8kg, but comparable to the Counterweight results (Counterweight, 2004). However, both the Frost and Counterweight studies used a combination of energy prescription (2.1 MJ or 500kcals less than energy requirement) with the additional benefit of Orlistat (a lipase inhibitor) and it is known that medication improves long term weight loss (Avenell et al., 2004b). Nonetheless these results of dietetic led dietary treatment are all improvements on the mean results reported by Dansinger et al., (2007) who looked at dietary counselling for weight loss. The dietary advice provided by Taylor and team was based on the National Food Guide (Hunt et al., 1995) recommending a low fat and high fibre diet. Cowburn and Summerbell (1998) reported that this advice is the usual dietary advice provided by dietitians. The weight loss clinic also uses the National Food Guide with additional dietary targets (low fat, reduction of portion size etc.,) as appropriate for each patient, making an individualised plan and also a diet based on a low fat dietary plan.

However, as stated in the recommendations of the BNF (1999), achieving weight loss is just one part of the obesity management problem. Maintaining body weight after weight loss is just as important. Hill et al., (2005) suggested that dietitians should be the main focus of weight management; approaching the problem through tackling the three goals; : preventing weight gain, producing weight loss and
maintaining weight loss. It is this latter aim that dietitians have not reported as being able to address.

2.4.3. Weight Loss and Maintenance Programmes
Weight regain is a problem after virtually all dietary and behavioural interventions for obesity. Brownell and Jeffrey (1987) stated that the treatment programmes for obese individuals current at that time were not effective over the long term, leading to the common wisdom that persons who are successful at weight loss will regain it all within 5 years. Stunkard and McClaren-Hume's study of 100 obese individuals, in 1959, showed that two years after treatment only 2% had maintained a weight loss of 20lbs (9.1kg). This study is commonly quoted as the source of the statement that "98% of people who lose weight will regain it" and although this statement was produced half a century ago it has remained the pessimistic message that supports the idea that weight loss is futile. However, on closer examination of the study it showed that, out of 100 individuals, only 2% managed to maintain the whole amount of weight lost of 9.1kg (20lb), which does not reflect what degree of weight loss the other participants managed to maintain and by today's standards their undocumented maintenance of weight loss could be seen as successful. Kramer et al., (1989) followed 152 people who had successfully lost weight for 4 years and found that only 5% of the sample could maintain all their weight loss consistently over the 4 years. However, if only year 4 was investigated, 31% had managed to maintain the weight loss that occurred in that year, this shows a great variation in weight loss at any one time. If success was defined as a weight loss of 5% of initial weight, 35% were successful over 5 years.

An American study, by Wadden et al., (1989), involved 76 women following a six month low calorie diet (5MJ(1200kcals)/day) and 96% participants lost >5kg weight which is better than the results obtained from British dietetic clinics (Grace et al.,
1992; Counterweight, 2004; Taylor et al., 2003; Thomas, 2006). This is possibly because the study by Wadden and colleagues used a lower calorie diet than is traditionally used in dietetic clinics and they may have recruited obese participants, who may not have attempted weight loss before. Generally, people attending NHS dietetic clinics have struggled with weight loss, having tried many commercial programmes, such as Weight Watchers, before seeking medical/dietetic help. However, in the Wadden study (1989) only 52% had maintained the weight loss at the 12 month follow up consultation session and only 11% at five year follow up. The relapse rate appears high in comparison to the participants in Kramer’s study (1989) where 35% maintained a loss of 5% initial body weight over 5 years and as in Wadden’s study, 50% patients returned to pre-treatment weight within 12 months. This could be due to the use of a very low calorie diet which is difficult to maintain over long periods of time. No studies have been reported on weight loss maintenance following treatment through NHS dietetic clinics in the UK.

In 1992, the American National Institute of Health Conference (USA) on Voluntary Methods for Weight Loss concluded that short term programmes, achieving <10% body weight loss, will have as many as one third regaining that weight at the end of the year (NIH Technology Assessment Panel, 1993). This is an impressive result as it implies that 66% achieved a maintenance of a weight loss of <10%. This is of relevance to the NHS dietetic treatment programmes within the UK, as treatment programmes are required to be short-term and effective in achieving health benefit (5 – 10% weight loss), in order to allow increased patient numbers to be treated within limited financial budgets. If NHS programmes could also deliver 66% of a cohort achieving meaningful weight loss maintenance after completion of a short-term programme, this would be clinically and economically effective. However 66% is a higher rate than other studies have quoted, which is possibly due to the group
using percentage body weight against an actual weight loss. The Wadden study quoted an average weight loss of 13kg which could be a lot more than 10% weight loss for some individuals.

Anderson et al., (2001) conducted a meta-analysis of 29 weight loss studies carried out in the United States. Most of the studies included were observational, with only 3 being randomised controlled studies but they were all studies that had used structured weight loss programmes and followed participants for at least 2 years. They showed the average maintained weight loss was >3kg and >3% body weight lost over 5 years; which amounted to 23% of the original weight loss. They also noted that if the individual lost >20% the weight maintenance was more successful.

A more recent study by Wing et al., (2006), showed that a group of successful dieters recruited by a variety of means who had lost weight through different dietary measures were successful at weight loss maintenance when provided with regular support. It appears from this study that the method of weight loss was not relevant and supports analysis by Dansinger (2007) that there was no difference between diets that limited fat or energy intake, but agreed that weight loss was statistically significantly greater with combined diet and exercise. An important note is that people were recruited to these studies (from advert or through community weight loss programmes and thus) the individuals are generally self-selected and therefore more likely to be motivated participants (Perri & Corsica, 2002), so when generalising the results to the average clinic population lower success rates might be expected. The issue of self selection is important when considering motivation for change and the appointment allocation process in the WLC has been designed to assist this.
In addition it must be considered that the treatment duration is closely related to the amount of weight lost and maintained and as a consequence weight loss over longer periods of time and the provision of continuing care maybe necessary to forestall relapse (Latner, 2007)

2.4.4. What Qualifies as Weight Maintenance?

Wing and Hill (2001) reviewed studies describing weight loss maintenance. They found that the success rate depended on the definition of ‘success’ in weight loss maintenance and the duration of the follow up period. As already mentioned, a sustained weight loss of 5 – 15% of initial body weight is associated with significant health benefits (Goldstein, 1992) and if successful weight loss maintenance is defined as an intentional weight loss of 10% of the initial body weight and maintenance of that new weight for one year, Wing and Hill (2001) estimated at least 21% of obese people can be regarded as successful. However, prior to this Ayyad and Anderson (2000) reviewed a number of extended studies (3 -14 years; median five years) and they defined success in weight maintenance using two criteria:

- maintenance of the entire weight loss
- maintenance of >9 - 11kg (generally representing 10%) of the initial weight loss.

They reported that overall 15% of patients met one of these criteria for success, so success was lower than shown in the Wing and Hill study. Using the Ayyad and Anderson (2000) criteria, suggests that the former definition of maintenance of the entire weight loss would be a more applicable definition when looking at the success rates of UK NHS dietetic clinics. The initial weight loss in these clinics is only marginally above the 5% desirable goal and between 5 – 7kg weight loss and it is
desirable that all the weight lost is maintained. However it is a challenge to maintain exactly what has been lost and body weight will fluctuate.

In a later study Wing and colleagues (2006), described successful weight loss maintenance as preventing weight regain; showing that, over time, professionals have come to appreciate how difficult weight loss maintenance is and struggle to define success. Trying to reduce the total amount of weight regained is crucial; in the 2006 study of Wing et al.; success was viewed as regaining less than 2.3kg over a period of 18 months. They chose this weight as it is a larger change than would be expected with daily weight fluctuation and because of the public health implication.

In the same year (2006) Stevens and co-workers attempted a consensus statement for the definition of weight maintenance. These authors highlighted the difference in definition between two leading bodies in USA: the clinical guidelines on the evaluation and Treatment of Overweight and Obesity in Adults have defined weight loss as a weight regain of <3.3kg (6.6 lbs) in two years (NIH, 1998), whereas the Institute of Medicine defined weight loss maintenance as losing at least 5% of body weight, or reducing BMI by at least one unit and keeping below this level for one year (Institute of Medicine, 1995). Both of these definitions are not as demanding as the criteria set by Ayyad and Anderson (2000). Stevens et al., (2006) looked at the definition of weight loss maintenance in English published studies from 1999 onwards. They divided the studies found into those that defined weight loss maintenance following weight loss or weight maintenance with unspecified weight loss. They analysed 10 studies that reported on weight maintenance following weight loss. All studies defined weight loss as losing 5 – 10% of body weight. Half of the studies defined weight loss as reference to the initial weight and the remaining half referred to weight after weight loss.
Table 2.1 shows the definition used in the studies where weight maintenance was compared to the weight after weight loss.

**Table 2.1 Studies describing weight loss maintenance**

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Weight Maintenance Definition</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crawford et al.</td>
<td>2000</td>
<td>Maintain 'new weight' or less</td>
<td>1 year</td>
</tr>
</tbody>
</table>
| Field et al.   | 2001 | a. gain no more than 5lbs from new weight  
b. gain no more than 5% | 4 years  |
| Lowe et al.    | 2001 | a. maintain at least 5%         
b. maintain weight loss of 10%  
c. remain within 2.5 kg (5lbs) of goal weight | Not stated |
| McGuire et al. | 1999 | Maintain 10% weight loss, then  
± 2.5 kg (5lbs) for 1 year+ | 1 year   |
| Moore et al.   | 2000 | ±0.5kg (1lb)                   | 8 years  |
| Mogul et al.   | 2003 | Weight regain ≤3 kg            | 2 years  |

The issue with comparing these definitions of weight maintenance is the differing degrees of weight loss prior to maintenance phase. Crawford et al., (2000); Field et al., (2001) McGuire et al., (1999) and Mogul et al., (2003) all used a weight loss of 5 – 10%. Whereas Moore et al., (2000) defines weight loss as >0.5kg (1lb) a year and Lowe et al., (2001) as 2.5 kg (5lbs) less than start weight – encouraging weight maintenance in a normal BMI range. In a population with a BMI >30 the loss of 5 – 10% is seen as clinically important. Stevens et al., (2006) agree that the definition of weight maintenance should be larger than the usual expected variations in weight driven by fluid balance and measurement error and be smaller than a meaningful change in body weight. This ‘meaningful’ change is seen as 5% and therefore they
suggest this should be upper bound of what is considered weight maintenance, which would be in agreement with Crawford et al., (2000); Field et al., (2001) McGuire et al., (1999) and Mogul et al., (2003). However the dilemma is the setting of a lower band of weight maintenance. Stevens and colleagues (2006) suggested that weight maintenance be defined as a weight change of less than ±3%. This figure is in agreement with the study published one year later by Dansinger et al., (2007) with 3% of an initial weight loss of 6% maintained at four years.

Nonetheless there is a clinical issue, as individuals enter maintenance after differing degrees of weight loss and as such maintaining a 'prescriptive' amount of weight loss may not provide a useful tool for each individual.

2.4.5. How is Weight Loss Maintained?
Little is known about the factors responsible for weight regain following weight loss. There are compensatory metabolic responses to weight loss such as; a reduction in resting energy expenditure, a reduction in blood leptin levels (leptin is a signalling molecule released from adipocytes which is secreted into the blood, in levels proportional to the amount of body fat. It then travels to the brain causing a decrease in appetite through acting on specific neurones in the brain and is subsequently reduced in amount when there is a reduction in adipose tissue); or an increase in ghrelin (a gut peptide) which causes an increase in hunger cues, rising before a meal and decreasing on consumption of food, playing a part in regulating food intake (Wadden et al., 2004). See Appendix B for a diagrammatic explanation of the action of leptin and ghrelin. These control systems of energy balance are complex as there is a great deal of interaction between them all, these responses are there to protect the individuals against the adverse effects of starvation. However, perhaps more important than biological factors, is the fact that once individuals leave treatment they are exposed to an environment that encourages the
over-consumption of food, high in fat and sugar (Hill et al., 2003). Weight regain appears almost to be inevitable against all of these factors. Colvin and Olsen in 1983 suggested from their observational study that people who were successful in weight maintenance adopted certain behaviours, including better nutrition, increased exercise and self monitoring. Less is eaten between meals; less fat, refined sugar and red meat are included in the diet. The shift towards increased activity as a maintenance strategy seems to be significant. These results are supported by the later work of Wadden et al., (1989) and Anderson et al., (1999). These studies span 15 years and illustrate the need for weight loss maintenance strategies to encompass an increase in activity. With the increase in the numbers of obese and overweight adults in the UK being partly due to inactivity these strategies will be increasingly beneficial.

In the USA, the National Weight Control Registry (NWCR) provides a unique dataset as it is a registry for those that have successfully lost and maintained weight loss. The registry has a list of members who have lost weight through various means (either commercial or personal diets) and have achieved and maintained a weight loss of at least 13.6kg for at least one year. Membership to the registry is voluntary and, as such, self selecting. All registrants self report their body weight, which has been shown to be a reliable method of reporting (Stunkard and Albaum, 1981). Baker and Kirschenbaum, (1993) reported that consistent self monitoring is related to weight loss as it allows individuals to detect weight regain in the early stages and initiate change to reverse the trend and avoid major relapse. Phelan et al., (2003) studied the weight control patterns of individuals in the NWCR, and reported that few individuals recover from a 1 – 2kg lapse in weight maintenance that is increasing weight by 2kg above their normal weight indicating that weight control appears to be in a tight band. Phelan and team reported that preventing weight
regain is critical because of the difficulty in reversing small weight increases. St. Jeor et al., (1995) reported that true weight maintainers manage to control their weight within a 2.5kg band, which is similar to the finding from the NWCR and matches with that of the 2.3kg weight maintenance figure suggested as successful by Wing et al., (2006). From these studies a suggestion that individuals should manage their weight closely to ensure maintenance within the ±3% weight change suggested by Stevens et al., (2006).

Several studies have been published utilising the data from the NWCR. These help to inform the predictors of successful weight maintenance by examining factors that are common across the 3,000 people who contributed data to the registry. However, over three quarters of the registry participants are women, with >80% being college educated and 64% being married (Wing and Phelan, 2005). As such they represent a higher socio-economic group which may influence their nutritional choices and ability to adhere to behavioural changes.

Wing and Hill (2001), Wing and Phelan (2005) and Wyatt et al., (2002) reported on the factors that have helped NWCR individuals maintain their weight loss. Decreased intake of fat and consequently energy; increased intake of dietary complex carbohydrates; improved physical activity; regular self monitoring of weight; eating breakfast and a consistent eating pattern, are all part of a successful weight loss maintenance strategy. Tuobro and Astrap (1997) completed a randomised trial comparing a low fat ad lib diet with a diet of fixed energy intake, showing that a low fat diet is better at maintaining weight loss. However, their fixed energy diet provided 7.8 MJ – 5.2MJ (1860 – 1240 kcals) and they made no calculation of the energy content of their low fat diet. The average energy intake, for those in the NWCR, was 5.5 MJ/day (1300 kcal/day) for women and 7MJ/day (1700 kcal/day) for men (Shick et al., 1997) and reporting that low fat diets were more extensively used, suggested
that low fat diets support a lower energy intake. Colvin and Olsen (1983); Wadden et al., (1989) and Anderson et al., (1999) all support the results characteristics of weight loss maintenance described in the NWCR. A study by Anderson et al., (1999), looked into the benefits of very low calorie diets, and showed that, of those achieving 5% weight loss, 50% maintained this after a year by providing a maintenance programme which included:

- education on self monitoring of body weight
- management of 'perceived failures' e.g. food binges, stress eating
- regular eating of low fat, high fibre diet
- increased exercise.

These results support those reported previously by Wadden and colleagues in 1989.

2.4.6. Weight Loss Maintenance and Exercise
The role of physical activity in weight loss maintenance appears significant. Kayman et al., (1990) showed that exercise is essential for weight loss maintenance. Hill et al., (2005) described the energy gap – where people who lose weight by energy restriction alone, decrease their total energy expenditure due to a decrease in resting metabolic rate and a lower energy cost of moving a smaller body. Hill and team estimated that this energy gap can be 8kcal/day per pound (0.5kg) of weight lost. This presents a major challenge for weight loss maintenance. A total weight loss of 20kg can produce an energy gap of approximately 1,344kJ/day (320kcal/day) (corresponding to a meal of cereal and milk); resulting in the individual eating 1,344 kJ (320kcal) less every day to maintain the weight loss. Alternatively, this energy gap could be filled by increasing the physical activity or a combination of physical activity and dietary restriction.
Work on the NWCR completed by Klem et al., (2000) suggested that people maintaining weight loss find that the pleasure derived from maintaining weight loss out-weighed the effort required adhering to eating and activity plans. Effort and attention to weight loss maintenance is greatest in the early part of the maintenance phase and appears to require less effort as time passes and effort becomes habit. This suggests that continued support from a professional is more crucial in the early phase of maintenance. Most of the maintenance studies have looked at maintaining weight loss over one to five years, as long term maintenance of weight loss is obviously the target. However, the results of the randomised controlled trial on weight loss maintenance by a collaborative group in the United States (Svetkey et al., 2008) illustrates the rapid weight regain in the first 12 months post intervention (3–4kg) and suggests that it is crucial to establish good weight management practices in the early phase of maintenance, to prevent weight re-gain and to avoid losing momentum early on. This is particularly important when the target weight loss in clinical setting is >5% which may represent only 5kg weight loss.

In terms of length of treatment, Sherwood et al., (2006) showed that despite treatment being available for individuals trying to lose weight over 24 months, participation diminished after 6 months indicating the brief period of time to initiate and maintain behaviour change. Of note is the number of studies completed in the United States into weight loss maintenance with none coming from the UK. Therefore, a study looking at maintaining weight loss in the early few months after leaving a weight loss programme requires investigation in the UK.

2.5 The Role of the Dietitian

2.5.1. Role of the Dietitian in the Treatment of Obesity
Dietitians are ideally qualified to sit at the centre of the Obesity Task Force for both treatment and prevention (DH, 2004). They are health professionals skilled in
nutrition, weight loss management, behaviour modification and regularly involved in obesity treatment within the NHS.

It is known that dietitians can assist people in losing weight within specific weight management clinics (Grace et al., 1998). In a review article, Summerbell (2007) stated that the dietary treatment recommended by NICE (2006) should be tailored to the individual and adapted over time to meet the needs of the patient and that this requires skills that dietitians possess and most other health professionals do not. However, Glenny et al., (1997) rated dietary weight reduction achieved by dietitians as being unsatisfactory. This was supported by MacQueen et al., (1999) who showed that, in a general dietetic clinic, patients lost an average of 1.5kg over a six month period. However, the recent Counterweight Group (2004) has shown that dietitians can help individuals achieve a >5% reduction of initial body weight by the end of a 12 month period, with 34% of patients achieving this meaningful weight loss, which is in agreement with the meta analysis of Dansinger et al., (2007). The Counterweight project was developed to tackle obesity management in primary care. Dietitians with specialism in training staff in obesity management, train practice nurses in the operation of weight loss clinics within primary care; so in effect dietitians are not conducting the face to face contact with patients. Weight loss targets are given as 5 – 10% weight loss. A Cochrane review by Harvey et al., (2001) on health professionals’ management of overweight and obese people states that there were few solid leads at that time regarding obesity management and that dietitian-led treatments may well be worth further investigation. Some seven years later there is still a need for investigating the role of dietitians in obesity management.

In comparison a systematic review of commercial weight loss programmes in America which do not involve dietitians has shown the largest reported weight loss
to be 3.2% of initial weight at two years. This suggests that individuals may do well initially but over a longer period of time fail to maintain their velocity of weight loss and begin to regain or even restore body weight. The Counterweight project has achieved a mean weight loss of 3kg (4.3kg in high attendees) which is remarkably similar to the results of the WLC (Thomas, 2006), with 40% achieving 5% at 12 months, compared to 67% of the WLC achieving 5% at one year. Within Counterweight the results showed that at 24 months with regular attendance weight loss remains at 3.3kg. It must be noted that some patients within the Counterweight Project do receive weight loss medication. Some treatments using very low calorie meal replacements have reported weight loss as high as 15 – 25% of initial weight but many of these did not control for, or report attrition rates and therefore the results are thought to be a best case scenario (Tsai and Wadden, 2005).

2.5.2. Patient/Dietitian Relationship
The adoption of dietary advice and assimilating it to effect behaviour change constitutes the dietetic interview. A person’s belief that they can motivate themselves and regulate their own behaviour plays a crucial role in whether they can adopt dietary change or alter their physical activity levels. People who have a barrier in self belief may see little point in trying to alter their behaviour, let alone believing that they know what it takes to succeed. If they make an attempt, they give up easily in the absence of rapid results or in facing set-backs (Bandura, 1997). This can often be described as ‘lacking motivation’. Motivation is described as a state of readiness or eagerness to change behaviour (Miller and Rollnick, 1991). This state can change from time to time and situation to situation. It is a state that can be influenced and so dietitians work on motivation to help initiate change in the client. Prochaska and DiClemente (1986) examined the different phases of habit change (Figure 2.2). They illustrated that people move through varying stages, from
contemplation of change, to initiation of change and to maintenance of change. The model also describes relapse as part of the change process. The majority of health education in the United Kingdom targets perceived risks and benefits. This process of education in the main succeeds with people who believe they have the capacity to change their lifestyle habits (Strecher et al., 1994). The issue for the dietitian is that weight loss requires many levels of dietary change and in addition, changes to levels of physical activity and so change is complex. Therefore, people who have a low level of self efficacy are more likely to 'drop out' of treatment, perceiving the goal to be too difficult and unattainable, describing it as 'lacking the motivation'. This lack of self belief is based on many failed attempts at weight loss including the need to see rapid results. The dietitian has to engage the patient in a process of believing change to be achievable. Success requires overcoming recurrent obstacles – a skill that the dietitian must adopt is to be able to generate a sense of self belief in the ability to initiate dietary change. In the NICE guidance (2006) it is recognised that all advice should be tailored to addressing the potential barriers to change as in the BNF guidance (1999) and that the treatment mode should be applicable to the patient. Dietitians are aware that advice alone is not likely to be sufficient to induce change in the majority of individuals primarily due to this level of lack of self belief. There are three critical conditions for change, as suggested nearly 50 years ago by Carl Rogers (1959):

- accurate empathy
- non-possessive warmth
- genuineness.

However, the wholly non directive strategy that Rogers favoured can leave a client confused. Clear advice can stimulate change especially when delivered specifically; explaining why the change is important and how the change will influence the area
of health risk. In this case, the dietitian working with the patient seeking weight loss will target advice specifically to the individual’s pattern of behaviour and their belief systems. Development of good rapport with the client is essential, as this develops a good working relationship with the client; it also helps to develop confidence (Miller and Rollnick, 1991). Appropriate weight loss may take many months to achieve, therefore the relationship between the patient and the dietitian has to be an enduring one. The use of the Rogerian theory of critical conditions for change (Rogers, 1959) still proves crucial in developing the atmosphere in which change can occur.

Jones et al., (2007) provided valuable insight into the relationship between the weight loss patient and the dietitian. Most patients value the professional support, motivation and encouragement provided by the dietitian. Half of the 24 patients interviewed by Jones’ team reported a positive relationship with the dietitian. Many interviewees stated that they needed to feel accountable to someone and that they valued having a dietitian to monitor their weight loss, which agrees with the findings from focus group studies of participants who took part in the BBC ‘Diet Trials’ project (Herriot et al., 2008). This was also seen in the patient satisfaction survey completed as part of the Service Development Project (Thomas, 2006), where patients engaged positively with the dietitian conducting the Weight Loss Clinics.

Frequency of contact with the health professional is also important in motivating and maintaining behaviour change. Jeffrey et al., (1979) and Perri et al., (1992) have indicated that frequent follow up of patients in the early stages of treatment may help to improve weight loss. Therefore, the regular follow up of WLC patients is crucial for weight loss and also encourages development of rapport between the patient and professional.
Rothman (2000) described how participants in weight control programmes can find it difficult to satisfy their expectations as to how a change in weight will affect their life and this makes maintenance harder to achieve. Therefore the dietitian, who has developed a good relationship with the patient, can help to educate and inform the patient of the benefits of weight loss and maintenance.

2.5.3. Degree of Professional Support in Maintenance

In clinical trials, some researchers have tried to improve the long term results for participants by offering post-treatment programmes in an effort to maintain their weight loss. Perri et al., (1984) evaluated three treatment conditions (dietary advice with non-behavioural therapy; behavioural therapy; or behavioural therapy with relapse prevention training). Each group had either no contact post-treatment or post-treatment contact through phone or post. The groups that received relapse training and post treatment contact achieved significantly better weight loss maintenance up to one year post treatment, which was the end of the investigative period. This suggests strongly that post-treatment contact is necessary to enable participants to implement the strategies learnt using the theory of self efficacy and the development of self-regulatory tools. A randomised controlled study that compared a professionally supported maintenance programme against having no professional support, showed a weight loss of 6.3% initial body weight was maintained over an eighteen month period for all groups regardless of professional support in maintenance (Leibbrand & Fichter, 2002). However, of note was that the initial weight loss had been achieved through an inpatient setting and used a cognitive-behavioural programme and could have instilled more rigorous behavioural change. An earlier study by Perri et al., (1989) considered length of treatment and the differences in results. Participants were assigned to either 20 or 40 week programmes for weight loss, where the longer treatment programme
discussed weight control in more detail. The people in the 40 week group lost significantly more weight (35%) and maintained that weight loss better than the 20 week group. At 72 weeks the extended treatment programme produced greater mean weight losses. This suggests that an extended treatment programme which provided therapist support, more detailed education and maintenance advice and support; improves long-term results. One of the most crucial observations in this study was the increased amount of weight loss in the extended treatment group (albeit the weight loss velocity was slower in the second half of the treatment programme: 0.5kg (1.17lb) / week to 0.18kg (0.39lb)/week). Knowing that the greater the weight loss is the better the degree of weight maintenance provides encouragement for maintaining a longer treatment programme. However, this does raise questions of economic efficacy. Wolfe (1992) suggested that the success of the Perri study may have been due to the fact that people had reached ‘personally meaningful goals’ and therefore increased their self efficacy, in that they had lost 13kg against the other group achieving only 9kg weight loss, supporting Rothman’s theory (2000). This demonstrates the issues in helping people to understand the principle of losing only 5 – 10% body weight, rather than aiming for an ideal body weight, developing the Bandura model (1986) of outcome expectations and perceived causes of success or failure (Figure 2.1 section 2.7.1).

The work of Wolfe (1992) is supported more recently by Byrne et al., (2003), which demonstrated that weight re-gainers were more likely to be dissatisfied with the weight loss achieved, evaluating self worth in terms of shape and weight, with a tendency to use food to regulate mood in the absence of vigilance with regard to weight control. This latter finding is of particular interest as self monitoring of weight and use of weight control strategies is seen as beneficial to those maintaining weight in the NWCR (Phelan et al., 2003) and Anderson et al., (1999). However,
this raises the question regarding continued monitoring of weight and realising that it is not reducing further could further increase feelings of dissatisfaction in individuals who felt dissatisfied with their weight loss.

Relapse has long been known to be part of the change model (Prochaska and DiClemente, 1986 Figure 2.2) and it occurs when the individual finds it difficult to maintain new behaviours. It is important to focus on relapse as a vital part of the change process. If neither discussed nor included in treatment, relapse is perceived as failure rather than part of a normal process. Therefore, assisting weight loss maintenance seems to be centred on preparation for maintenance, tools to help in that maintenance and prevention of relapse; some degree of therapist contacts and continued self monitoring of weight and dietary behaviour with regular exercise. It can be suggested that contact in the early phase of maintenance may provide more support for individuals and maximise long-term success.

2.5.4. Dietitians and Weight Loss Maintenance
An American dietitian and her colleagues (Leser et al., 2002), followed twenty-seven women who had successfully lost weight on a very low calorie diet programme (< 5MJ or <1,200 kcals/day). Individuals were assessed three years after ending their treatment programme and on average, they had lost 19% of their initial body weight by following the diet but three years later, they had re-gained 75% of that weight loss having maintained only a mean of 5kg of weight loss. In the Leser study (2002) there was a significant correlation between fat intake and those more successful at weight loss maintenance, which is supported by the Tuobro and Astrap trial (1997), and Wing and Phelan, (2005). Leser supported the view that dietitians should help clients to restrict their fat intake to 30% of their total energy intake. Similarly, Siao Mei Shick and colleagues (1998) stated that dietitians need to be involved in their patient’s progress to promote successful maintenance of weight
loss even after their weight-loss goals have been achieved. However, in the UK the cost of continued dietetic contact is not sustainable within the current resource restricted NHS. Therefore, new ways of working and supporting individuals in their life-style changes is essential to help them maintain their weight loss.

Jeffery and French (1999) made recommendations to improve weight gain prevention programmes, by

- increasing the frequency of contact
- making programmes tailored and interactive
- focusing on increasing physical activity and changes in eating patterns
- having strategies to help with weight gain
- Maintaining motivation in the long-term.

However they recognised the need to reach large groups at low cost whilst still providing interventions that are frequent and tailored. NICE (2006) suggested providing on-going support by telephone, post or internet. The internet seems to provide the most cost effective means in terms of time and effort to reach large groups of people.

2.6 The Internet

2.6.1. Use of the Internet
Development of cost effective approaches that can reach a wide population of individuals has considered post and phone based approaches but the results, although efficient, are disappointing; benefiting weight gain rather than introducing weight loss (Sherwood et al., 2006). The internet is also a means to deliver tailored interventions at minimal cost to a large population. Ziebland et al., (2004) investigated the use of the internet for people with serious illness and suggested that Individuals view the internet as a safe environment, which when embarking on
health treatment programmes is less embarrassing than using face to face consultations or telephone interventions. Winett et al., (2005) suggested that internet based programmes work well with those who have incorporated internet use into their daily lives. The questions have been;

- does everyone who needs access to the internet have it
- would people use it

In March 2007, the total number of internet users worldwide was 16.9% of the world’s population (House of Lords, 2007). In 2007, nearly 15 million households in Great Britain (62.3 per cent) had internet access. This is an increase of just over 1 million households (7%) over the previous year and nearly 4 million households (36%) more than 2002 (National Statistics, 2007). Of that 61%, 84% had broadband connection, which allows faster connection to the internet and an ability to download more complex documentations. The UK is the largest user of the internet in Europe. A study in the USA, by Baker et al., (2003) where >50% of the sample had internet access which is not dependent on cable TV installation, showed that 40% of those with internet access use the worldwide web for advice or information about health care, with 6% using e-mail to contact a health professional. Seventy per cent of the group were aged less than 50 years, suggesting that technology may attract younger populations. Saperstein et al., (2007) reported that the general public in the United States are more frequently using the internet as their first line of information for diet and fitness and have reported that information found online has impacted on their behaviour. Similarly Susannah Fox director of the Pew Internet Project (Fox, 2005) says that users of the internet “do their health homework on-line”. A Cochrane Review (Murray et al., 2005) on Interactive Health Communication Applications (IHCA) for people with chronic disease investigated the benefits of computer based/web-based packages for patients with chronic disease. The reviewers state
that HCAs have largely positive benefits on users who tend to become more knowledgeable and have improved behavioural outcomes compared to non-users.

2.6.2. Obesity, Internet Use and Social Deprivation

Obesity is linked to social class being more common in those conducting routine or semi routine occupations rather than managerial or professional roles. In 2001, 30% of women in routine occupations were classed as obese in comparison 16% in higher occupational/professional roles (National Statistics, 2001). In comparison in 2003 the Scottish Public Health Observatory (SPHO), they said there was an increasing prevalence of obesity with increasing deprivation, but the trend for being overweight (BMI 25 – 30) was in the opposite direction. They therefore suggest that the trend is for the whole population to be 60% obese and overweight except in the least deprived women (SPHO, 2008).

Despite a previously reported shift in the demographic profile of home Internet users towards lower income groups and older consumers since January 1999, further growth, in these groups, seems to be in line with the increasing trend of the use of the Internet (National Statistics, 2007). Therefore internet access seems to cover all sections of the community which, as obesity and overweight affects all sections of the community, the internet can be viewed as an applicable route for contact. This was confirmed by the results of the patient survey on those attending the WLC (Thomas, 2006). The large majority of patients attending this clinic where all were >BMI 30, were employed (63%), 26% unemployed and 11% retired. In this same population almost two thirds (74%) had email access.

2.6.3. Internet Security

When it comes to security online, the internet has an image problem. With 86% of the population of the USA indicating that they have an issue with the security of personal information placed on the web (Gartner, 2001). Within the UK there is
growing concern about the amount of personal information that is transferred through the internet. The UK government in 2007 produced the first report on personal internet security, which encourages increased legislation to make the internet secure (House of Lords, 2007). Mistrust in the security of the system when information of a highly personal nature is being transferred is an area of conflict for the use of the internet to access health information.

2.6.4. Weight Management and the Internet

There is interest in the use of the internet in achieving and maintaining weight management behaviours. Computer tailored nutrition education to provide various dietary targets including weight loss has been viewed as promising and innovative (Brug et al., 2003). When the studies that have investigated the benefit of the internet to deliver weight loss have been examined, researchers have used web-based interventions, interactive web resources and therapist contact through email. All bring differing results and responses. Within the UK, a website ‘http://www.dietaryadvisedirect.co.uk’ has been established by two registered dietitians to provide personalised dietary assessment and an advice resource. This web based information tool has been received positively by users (Brotherton and Pinder, 2007). The authors suggested that their web-based resource can support NHS obesity care pathways by assessing eating habits and motivation, together with providing instant access to dietary advice; however they do not provide any data on whether this resource does produce weight loss or dietary change in users.

A review completed by Weinstein (2006), selected eight studies, where five used information via the internet to achieve weight loss and three were focussing on weight maintenance. Four of the weight loss programmes produced positive results and results from the three for maintenance were equivocal. However, the studies were restricted in that all participants in the studies were white, educated people, in
addition each study used different aspects of the internet (chat rooms, education, email etc) so that, generalisation of the results is difficult. The studies in the review completed by Weinstein were all American. There was one UK study listed which had no data available at 2006 and as such was not available for the Weinstein review. Results published from a randomised controlled trial conducted by McConnon et al.,(2007) showed the effect on weight loss of participants’ access to a website. The group using the internet intervention had similar weight loss to the ‘face to face’ group, but attrition rates were very high (52% over a 12 month period).

Within the city where the WLC was conducted, over one third of the population is made up of service users classified by marketing as Suburban Comfort (18%) and Happy Families (14%) (Appendix C) which is a higher percentage than the average of the UK, (Machray, 2008). These groups use the worldwide web more than other social groups and Happy Families make much use of the internet to obtain products and services. Therefore, locally there is a population in the WLC that are keen to use new technology for their health information.

Womble et al., (2004) compared an internet based diet programme with a group-based face to face programme and showed that the internet programme was not as successful as a traditional approach. The main problem was that individuals failed to access the web-site frequently and did not make adequate use of the information provided. This confirmed the findings of Harvey-Berino et al., (2002) and McConnon et al., 2007, whereas Tate et al., (2001) had used the internet to successfully deliver a behavioural weight loss programme. Tate’s study involved two groups; one group could access a web-based education site while the other group could access the web-site but also had therapist contact through e-mail, including submission of diaries etc. The e-mail group had better weight loss outcomes, suggesting that e-mail contact with a therapist provided beneficial support. It was this email support
that was lacking from the Harvey-Berino (2002) and the McConnon (2007) studies. Another study by Tate et al., (2003) also supported using e-mail to help with weight loss in those at risk of diabetes, producing beneficial results, supporting the evidence from Baker et al., (2003) that e-mail use is generally wide-spread and viewed favourably by individuals. Stretcher and his colleagues (1994) showed that individualised family doctor’s initiated messages on risk reduction are more effective than standardised messages on smoking cessation, healthy eating or regular health checks. They suggest that personalised messages are read more thoroughly, remembered better and are more likely to be acted upon than standardised messages. This is an obvious benefit of using e-mail, where messages can be more personal. Donnelly et al., (2007) reported that the results from studies using the internet are encouraging yet only 50% of the population of the USA have internet access. The main issue with the internet is the speed of download and compatibility between machines and software. However, as seen by the UK statistics, (National Statistics, 2007) 50% of UK households have broadband connection with over 60% having internet access. Harvey-Berino et al., (2004) reported that attrition in those using the internet for treatment was not significantly different between those with broadband access (43%) against those who did not have broadband (57%).

Donnelly and colleagues (2007) suggested the use of telephone contact to provide better universal coverage and human contact. However telephone contact requires more time and costs on the part of the professional. An Office of Communications (OFCOM) report (2006) said that 16 to 24 year olds are spurning television, radio and newspapers in favour of online services, this generation has grown up with new technologies - and it is this generation for whom the uptake is instinctive. Therefore the use of the internet is becoming more universal than telephone especially for younger people.
Donnelly and team (2007) compared a traditional clinic setting to telephone contact; both groups exceeded 10% weight loss at baseline suggesting that the telephone maybe a viable option to traditional weight management clinics for both service providers and participants. This is similar to the findings from the study by Sherwood *et al.*, (2006), which showed no difference in results between face to face contact, mail and telephone contact.

### Table 2.2 Weight loss, weight maintenance and the internet

<table>
<thead>
<tr>
<th>Author</th>
<th>Design</th>
<th>Group</th>
<th>Intervention</th>
<th>Outcome summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tate <em>et al.</em>, 2001</td>
<td>RCT 6 month weight loss plan</td>
<td>91 participants BMI 25 - 36</td>
<td>Email messages and feedback from therapist versus control of internet education</td>
<td>Higher login frequency with intervention. Attrition in both groups 22%. Weight loss greater in intervention with 45% meeting 5% weight loss in 6 months.</td>
</tr>
<tr>
<td>Tate <em>et al.</em>, 2003</td>
<td>RCT 1 year internet weight loss programme</td>
<td>92 participants with diabetes Average BMI 33.1</td>
<td>Email communication with weight loss counsellor vs on-line weight loss tutorial, tip and message board</td>
<td>Sig. difference between intervention &amp; control. Higher login in intervention. Email improved results.</td>
</tr>
<tr>
<td>Tate <em>et al.</em>, 2006</td>
<td>RCT of Interactive website provided by commercial weight loss product</td>
<td></td>
<td>Intervention group 1. access to Slimfast website inc human email counselling; 2. As before with tailored email Control: access to website only</td>
<td>At 3 months losses greater in both intervention groups at 6 months the losses greater in human counselling group. Login frequency greater in email group than control.</td>
</tr>
<tr>
<td>Wing <em>et al.</em>, 2006</td>
<td>RCT of individuals successful in weight loss now in weight maintenance programme</td>
<td>314 participants who had lost &gt;10%</td>
<td>Intervention 1. Face to face contact &amp; phone support 2. Internet access, chat rooms &amp; email contact weekly vs control access to website only</td>
<td>At 6 months, both interventions better than control. Face to face group was better than email, but in effective use of time Internet &amp; email has greater scope.</td>
</tr>
<tr>
<td>Study</td>
<td>Intervention Type</td>
<td>Number</td>
<td>Baseline BMI</td>
<td>Follow-up Weight Loss</td>
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<tr>
<td>Womble et al., 2004</td>
<td>At 1 year less weight lost by internet group. High attrition rates (34%). Report that individuals are unlikely to reach significant weight loss through Internet programmes.</td>
<td>47 women BMI 33.5</td>
<td>Intervention access to ediets.com (weight loss programme) vs 'Learn' weight loss manual.</td>
<td>At 1 year less weight lost by internet group. High attrition rates (34%). Report that individuals are unlikely to reach significant weight loss through Internet programmes.</td>
</tr>
<tr>
<td>Harvey-Berino et al., (2002)</td>
<td>Internet group gained significantly more weight in 12 mo maintenance programme, than those face to face. Benefit of Internet support limited.</td>
<td>122 (85%) women BMI 32.2</td>
<td>Internet support inc email vs in person support vs minimal in person support</td>
<td>Internet group gained significantly more weight in 12 mo maintenance programme, than those face to face. Benefit of Internet support limited.</td>
</tr>
<tr>
<td>Harvey-Berino et al., (2004)</td>
<td>No significant difference between the three groups at 18 months. Contradicting the results of previous study.</td>
<td>255 (82%) women BMI 31.8</td>
<td>Three groups: 1. Bi weekly internet meeting &amp; email plus bulletin board 2. Bi weekly face to face meeting 3. In person meeting over TV.</td>
<td>No significant difference between the three groups at 18 months. Contradicting the results of previous study.</td>
</tr>
<tr>
<td>McConnon et al., 2007</td>
<td>Attraction 50% in internet group who lost 1.3Kg in 12 mo, compared to 1.9Kg in usual care</td>
<td>221 volunteers</td>
<td>Two groups; 1. access to web site, 2. usual care</td>
<td>Attraction 50% in internet group who lost 1.3Kg in 12 mo, compared to 1.9Kg in usual care</td>
</tr>
<tr>
<td>Svetkey et al., 2008</td>
<td>All interventions helped maintain a degree of weight loss. Monthly personal contact provided modest benefit whereas IT provided early but transient benefit</td>
<td>1032 (63%) women</td>
<td>Randomised weight loss maintenance intervention monthly personal contact; access to technology based intervention; self directed control</td>
<td>All interventions helped maintain a degree of weight loss. Monthly personal contact provided modest benefit whereas IT provided early but transient benefit</td>
</tr>
</tbody>
</table>

Hervey-Berino et al., (2004) have examined the use of internet to support adults in the long term maintenance of weight loss. They showed no difference between three interventions: an internet group - using e-mail and on-line chat rooms, versus those
who had frequent or minimal face to face contact for weight loss over a 12 month period in those who managed to achieve a 5% loss of initial body weight over the previous six months. However attrition was significantly higher in the internet group. This initial study suggested that internet based programmes for weight loss maintenance, may have limited appeal, but showed that those who used internet support achieved comparable weight loss and maintenance to those who had face to face contact. In a more recent study, Tate et al., (2006) compared three internet groups designed to monitor weight loss which provided different interventions:

- no counselling but access to website
- computer automated feedback (via email) and web site access
- human e-mail counselling plus web site access

Again, this was examining weight loss but in this study Tate et al., (2006) showed that, at three months, those having either automated or human e-mail contact lost the same amount of weight. By six months, however, the weight losses were greater in the human counselling e-mail group compared to the other two groups. This tends to suggest that the individualised approach of having human responses produces better effects, which is in agreement with the earlier findings of Stretcher et al., (1994). In all three of the Tate studies, contact with participants had been weekly but, in her 2001 study, individuals lost weight during the first 3 months and then individual log-ins were less frequent during the subsequent three month period, but her 2006 study showed that having a response from the website by email improved the level of login frequency. Tate et al., (2006) found a higher weight loss percentage in the group with human email contact (6-7%) compared to 5% in those receiving automated email responses. These results indicate that support using the Internet may require frequent human contact. The British trial reported by McConnon et al., (2007) showed poor results in terms of weight loss (1.3 kg) and
attrition (51%) over 12 months. This is possibly because of the lack of real therapist contact in the internet group. They also reported the costs of the internet group to be high due to the set-up costs of the web site (total costs; £992.40 compared to £276.12 for usual care). A similar study conducted in the USA (Stevens et al., 2008) has also shown that costs of website development and maintenance are expensive and time consuming. However they had lower attrition rates with only 20% lost to contact at the end of the first year, which the authors attributed to email and telephone prompts.

Generally, internet appears to be less effective than onsite programmes with face to face contact with a health professional for weight loss, which would be expected. However, the use of a remote system for weight loss maintenance may prove to be beneficial in the absence of a face to face facility being available. The use of email in addition to a face to face weight loss intervention has not been tested. The internet still provides the only means to reach large numbers of people simultaneously and also benefits those in rural or remote locations where access to primary care is limited or distant. Weinstein (2006) and NICE (2006) supported the view that long term maintenance of weight loss using the internet requires more research and the application of this method for various groups needs to be examined.

Wing et al., (2006) conducted a randomised controlled study of people who had successfully lost a large amount of weight (mean 19kg) and allocated them into a control group, two intervention groups where one received face to face intervention and the other used an on-line chat room for weekly counsellor support plus e-mail contact. The results showed that face to face contact helped individuals maintain their weight loss more effectively, with the majority regaining less than 2.3kg, whereas those in the internet group regained less weight than the control group but
gained more than the face to face intervention group. In this 2006 study, Wing et al., suggested that, from a public health perspective, the use of the internet for prevention of weight regain is desirable, although results are not as good as face to face contact they are nonetheless cost effective.

The internet continues to evolve as a method of health care delivery. Internet based programmes have an immediate advantage over personal programmes because of their time and cost savings. Most of the studies described above report a positive correlation between internet sessions, submission of dieting behaviour through food records, etc, and weight loss; all factors noted as helping weight loss maintenance. Weinstein (2006) suggested that any intervention that can personalise the internet experience, such as occasional therapist contact and meetings, may improve communication and results. Therefore a programme that uses e-mail for a discrete period of time may prove beneficial in supporting weight loss maintenance using the techniques known to be beneficial for the NWCR (Wing and Hill, 2001 and Wyatt et al., 2002), during the crucial initial phase where weight loss behaviours need to be firmly established (Klem et al., 2000).

2.6.5. Weight Loss Using Other Remote Support
In addition to the internet other strategies have been investigated to support weight loss outside of a clinic setting. Mail mediated programmes can communicate to large numbers of people however, their ability to motivate long term changes in health behaviours is unknown (Marcus et al., 1998). Phone-based programmes have shown moderate success. Sherwood et al., (2006) showed losses of 2.4 kg over nine months using telephone support. Donnelly et al., (2007) completed an RCT with a weight loss intervention delivered entirely over the phone via conference calls compared to a face to face clinic setting. Attrition was 25% in the telephone group which was lower than the clinic group. At 26 weeks weight loss in the two groups
was similar suggesting that a telephone based approach could produce weight management within the desired guidelines of a loss of 10%. This was in agreement with the earlier study of Sherwood et al., (2006) where support for weight loss by mail and telephone produced marginally better results than usual care. However Sherwood and team considered the cost of using telephone support which requires more intensive therapist support. They also commented on the need for engagement of participants in using telephone support as time constraints become influential in ensuring that participant and therapist link up. Both groups suggested that telephone contact provides a means to reach and engage individuals in effective weight loss, regardless of location or access to transportation. However, telephone contact incurs a significant financial and time cost for the professional providing support.

2.7 Theoretical Framework

2.7.1. Behavioural Domains of Weight Loss Maintenance

The activities known to help maintain weight loss have been listed above; however there is a need to assess how those activities can be adopted as behaviour. (See also the Patient/Dietitian Relationship: Section 2.5.1.). There are many models of health behaviour: the Health Belief Model (Rosenstock, Stretcher and Becker, 1988); the Protection Motivation Theory (Maddux and Rogers, 1983); the Theory of Planned Behaviour (Ajzen, 1991); the Transtheoretical Model of Behaviour Change (Prochaska and Diclemente, 1992); the Social Cognitive Theory (Bandura, 1986) are the most widely cited. The conceptual framework underlying these theories has been shown to be quite similar. The decision to adopt a new behaviour is normally based on an analysis of the relative costs and benefits associated with different courses of action. The health belief model (Rosenstock, Stretcher and Becker, 1988) and protection motivation theory (Maddux and Rogers, 1983) make no direct
reference to the maintenance of a new behaviour. They describe change as having occurred over a period of time and so maintaining that pattern of behaviour is thought to be the same behavioural pattern as the initial change. The more recent theory of planned behaviour (Ajzen, 1991) also makes no formal distinction between the decisions regarding the initiation of behaviour and the maintenance of that behaviour. As such, the model does not provide guidance on how the behaviour can be successfully maintained. From the work on dietary change it suggests that some patterns of behaviour need to be the same in the continuation of dietary adherence etc., however, a key issue for maintenance is the influence of external cues in maintaining change.

According to social-cognitive theory (Bandura, 1986), self efficacy beliefs are a crucial determinant of both the initiation and the maintenance of change in behaviour. Self confidence in an individual's own ability to take action serves to sustain effort and perseverance in the face of obstacles (Bandura, 1997). Successful management of behavioural changes supports each person's confidence and increases self efficacy (Figure 2.1). Successful maintenance depends on the implementation of an action plan that includes a set of cognitive and behavioural skills that helps the individual to cope with lapses and thus reduces or prevents relapse (Brownell et al., 1986), as described in the Anderson paper (1999).
Within the transtheoretical framework of behaviour change (Prochaska and DiClemente, 1992) (Figure 2.2), maintenance is characterised as a distinct stage, yet this is an arbitrary distinction of how long the behaviour has been adopted. Rothman (2000) suggested that maintenance is observed as action sustained over time, relying on the same set of skills that produced the original change. However, he describes this as being at odds with the consistent failure of individuals to maintain change. He suggested that behavioural maintenance is associated with the perceived satisfaction with the successful outcomes achieved by the new pattern of behaviour. This combines the theoretical frameworks of Prochaska and DiClemente (1986) and Bandura (1986). Later, Klem et al., (1997) showed that people who had been successful in weight loss maintenance reported how the results had positive benefits on their lives and similarly, Rothman and Jeffery (1998) found women who had maintained their weight loss attributed greater benefits to having lost weight than those who had regained weight, therefore having greater confidence in their own ability to maintain change, as described in Bandura's model. This supports the theory that unrealistic expectations about the degree of weight loss achieved from weight loss programmes undermines long term maintenance. This is an issue when
individuals are expected to lose between 5 – 10% of their initial body weight when many want to lose more aesthetically pleasing amounts of weight, as much as 40% of their original weight. Addressing this issue is crucial in the long term efficacy of weight loss maintenance.

**Figure 2.2 Stages of change model – Prochaska and DiClemente, (1986)**

Social cognitive theory (SCT) therefore provides a theoretical base for weight gain prevention. As described by the Prochaska and DiClemente cyclical model (Fig 2.2) lapse and relapse is to be expected. SCT suggests that there is a need to recover and return to adherence and that this develops a 'resilient sense of self efficacy' (Bandura, 1986). This resilient sense is developed specifically for a given set of health behaviours and will be developed over time, through a series of mastery experiences. These mastery experiences promote some degree of self efficacy
(planning, self-monitoring, problem solving - all elements of a good maintenance programme). Findings from SCT further suggest that the process of behaviour change and maintenance is assisted by social support. Bandura (1997) described this as the fourth generation of health behaviour intervention (first is information, second is external reinforcement, and third is self regulation). The fourth dimension features on the individual being aware of the social network around them to facilitate and maintain change, so that barriers to maintaining change can be overcome. Rothman (2000) suggested that an individual’s actual ‘satisfaction’ with their behaviour change after several months may be more important and predictive of maintenance, supporting Bandura’s theoretical model, more than the Prochaska and DiClemente model. The natural course of health behaviour change (in both of these models) involves a series of adherences, lapses, relapses and recovery as the individual faces new challenges. Interventions need to plan for these predictable episodes and be long enough to provide self regulatory tools to effectively problem solve and deal with all set backs. Therefore, a system by which individuals understand that control of weight loss maintenance is to prevent a gain above 2.3kg (as suggested by Wing et al., 2006) keeping their overall weight loss >3% (Stevens et al., 2006), uses a sound theoretical basis using Bandura’s SCT model.

2.7.2. Models of Relapse Prevention and Management
Marlatt and Gordon (1985) provided a conceptual model of the relapse process. They identified a common relapse process in substance misuse and smoking, where perceived confidence operates as a contributory factor. The common precipitants in breakdown of positive behaviour patterns include an inability to manage negative emotional states such as stress, depression, loneliness, boredom and restlessness. Although this model does not consider the abuse of food, it is possible to see how triggers such as depression, boredom and stress can all trigger overeating as a
response. Lack of self control is not easy to overcome when the individual is exposed to an environment rich in temptation, particularly for individuals who have a strong relationship to unhealthy behaviours. Control of food intake is therefore more likely to be vulnerable to relapse. People will go through many cycles of change and relapse before they finally succeed (Bandura, 1997; Prochaska and DiClemente, 1986). When setbacks occur, the lessons learned from the relapse and how the relapse is managed become critical and will help to ensure future success. By adopting the attitude that a relapse is a temporary setback brought on by strong social inducements (Christmas and birthday parties etc.) that may be avoidable or alterable, the patient may move forward but if the relapse is seen as a deficit in skills of self regulation they are more likely not to recover from the relapse (Bandura, 1997). A skill which dietitians possess is to make the individual aware of the risks of relapse and how to overcome set backs. Therefore, the method making an individual aware of relapse will enable maintenance of change to be enduring.

2.8 Gap in the Literature
This literature review demonstrates the lack of data in the use of the internet and email contact with a health professional in supporting those who have been successful in losing weight in a primary care setting to maintain that weight loss, within the UK. There are no randomised controlled studies that have been designed to test whether the use of email on its own, is an acceptable and successful communication strategy that enables more people to become successful weight loss maintainers. Within the literature there is little that has investigated the role of dietitians in weight loss maintenance and strategies given by dietitians to assist in weight loss maintenance, both within the UK and the NHS.
2.9 Aim and Objectives of the Study

The principal aim is to:

Assess whether the effects of dietetic support through the medium of email on weight loss maintenance in individuals who have been successful in weight loss are beneficial.

The specific objectives are:

- To compare over a six month period, in individuals who have achieved similar weight loss, differences in weight loss maintenance in individuals who have access to dietetic support via email compared to those who do not.
- To use a questionnaire to identify which factors either encourage or inhibit self-management of weight maintenance (consumption of breakfast, amount of fruit and vegetables eaten, eating a low fat diet, frequency of self monitoring of body weight, undertaking regular exercise) in participants who have successfully completed an NHS weight loss programme.
- To conduct interviews to assess the personal experience of using a remote communication method (email) between participant and professional.

2.10 Hypothesis

The apriori hypothesis to be tested is:

That in patients who were obese and have achieved a weight loss of >5% of their initial body weight, there will be a significant difference in weight loss maintenance in those who, following the weight loss period, have maintained contact with a dietitian through email compared to those who have no contact.
Chapter 3: Methodology

3.1 Study Design
The study employed a mixed methodology involving a randomised controlled study and the administration of a questionnaire that examines attitudes to weight loss maintenance and dietary adherence in free living obese participants, along with the results of exit interviews. Participants, who had lost ≥5% of their initial body weight, were randomly allocated to either an intervention and or a control group. The intervention group were exposed to the measure that was being tested (contact with a dietitian via e-mail) whereas the control group had no exposure to this intervention. A review of progress of both groups was made at the end of the investigation period (six months) to assess the degree of weight loss maintenance, the experience of individuals in both groups over the study period and assessment of whether the intervention had helped in weight loss maintenance.

3.2 Theoretical Framework

There are mainly two paradigms to the verification of theoretical propositions i.e. positivism and anti-positivism (or naturalistic inquiry). The positivist paradigm is based on the assumption that true knowledge is obtained by experiment and observation. The paradigm emphasises that there is a single objective truth that can be discovered by science. Within the positivist paradigm objectivity is a guiding principle, with the researcher required to stay neutral and disinterested in relation to what is being researched. There are elements of knowledge that it is hoped will be established. The study that has been undertaken is of an experimental design. It lends itself to statistical analysis and quantifies the results and the benefits of completing an experiment on a group of overweight/obese participants. The study requires a means to distinguish between the differences between the experimental
and control groups. Qualitative research does not allow this to happen easily and therefore a quantitative design is better placed for the analysis of the study. Quantitative data provides information on what happens whereas qualitative data provides answers for why it might happen, therefore a methodology that uses a mixed design may prove to provide the most comprehensive data. The advantages of using qualitative methods either as an integrated element of RCT designs, or as part of a multi-method design including an RCT, is increasingly acknowledged (Murtagh et al. 2007) and is advocated by the Medical Research Council (MRC) ‘Framework for development and evaluation of RCTs for complex interventions to improve health’ (2000).

Campbell and Pope (2000) pointed out that although the (RCT) is the best method currently available for evaluating the effectiveness of health care interventions it is originally developed for use in laboratory settings with inanimate objects, rather than for research on human beings in the dynamic socially constructed ‘real-life’ settings where many variables may not be under the control of the investigators. This is recognised in RCT designs in other fields such as education where RCT designs often involve a qualitative component (The Cochrane Qualitative Methods Group, 2008).

The specific uses and advantages of qualitative methods with RCT design may include pre-intervention development of the intervention/s and post-hoc interpretation of the findings i.e. helping to determine the ‘active components’ of the intervention, (MRC, 2000). Where the qualitative element is fully integrated within an RCT, improvements may be made to the RCT design. In general terms a qualitative component is likely to help in understanding why an intervention was effective or ineffective. For instance, qualitative research with sub-groups may help to answer
questions such as 'why does this intervention work or not work?' and 'for whom does it work best?' (Campbell and Pope, 2000).

Qualitative research can help to detect positive effects of an intervention which might not be picked up in a purely RCT approach. Adding this level of understanding to RCT design (i.e. ‘modelling’ the key variables rather than simply looking at outcomes) increases the chances of successful generalisation of effective interventions to ‘real-life’ settings. As Campbell and Pope (2000) put it, qualitative components of RCT designs facilitate answering question such as 'Will this intervention work in a variety of health care settings?' and 'What might be the problems in trying to introduce this intervention throughout a health service?

As mentioned in chapter 2 section 2.7.1, Bandura (1997) described health behaviour interventions as ‘not relying on information, external reinforcement and self regulation but on a more dynamic approach with a network of social influences to help provide continual support.’ Rothman (2000) noted that behavioural health interventions reliably report lapses and relapses, yet little attention has been focussed on the processes involved in long term change.

This study seeks to use the knowledge that relapse is a part of behaviour change and that following relapse, return to action, and maintenance of that behaviour change is due to a sense of self efficacy. In using therapist contact (that of contact with the researcher) that requires action from the patient, it is hoped to foster greater self efficacy and so develop and maintain long term changes. The experimental design allows an assessment of the social influences affecting individuals and their ability to maintain change.
As there is potentially some effect of the researcher being involved with the participants within the study, there are some subjective and interpretive undertones that affect the analysis obtained. These were examined qualitatively to add insight to the efficiency and effectiveness of the quantitative research.

3.3 Weight Loss Clinic (WLC)

This study has emerged from the researcher's development and operation of a Weight Loss Clinic (WLC) based at a district general hospital on the South Coast of England. The WLC was designed to meet the demands of the service and to look at service design to maximise effectiveness.

The WLC (see section 2.4.2.) commenced in 2005. At that time the service had undergone staffing reduction due to cost pressures within the NHS Trust running the hospital, which had in turn led to a reduction in outpatient clinics. This was set against an environment where the number of referrals for weight loss was increasing due to the increased awareness of the rising numbers of obese individuals (Thomas, 2005) and the situation was becoming unmanageable. Due to additional temporary funding from the Workforce Development Foundation, the Chief Dietitian who has an interest in obesity management (the researcher) was funded for an extra day a week to conduct the WLC and to also work alongside the bariatric surgery service.

The clinic was based in the theory of Perri et al., (1984, 1989) who suggest that regular follow up and contact with health professionals benefit patients who are trying to change their behaviour and lose weight; the WLC was designed to operate weekly by the same practitioner. Patients are seen and assessed and a specific dietary programme discussed with them. In general, patients undertake three styles of dietary change either: an individualised dietary plan, a low fat dietary plan, or a diet based on the Balance of Good Health which is a 1500 kcal/day plan (National
Follow up appointments were offered monthly or within six weeks depending on the patient's diary.

From an initial audit (Thomas, 2006) the format of the clinic was seen to be more effective than the traditional method of seeing patients in a mixed diet type outpatient session, where follow up could be up to three months apart and where patients may see a variety of dietitians. The results of the audit showed that 37% of patients lost >6% of their body weight within a six month window, which agrees with other practitioners experience (Frost et al., 2003; Counterweight, 2004) rising to 70% by one year. To accommodate the increasing demand of patient referrals, patients were discharged from the clinic once a suitable weight loss had been achieved (≥5% of original body weight depending on patient’s weight loss velocity). However, patients were not keen to be discharged and appreciated the benefits that regular contact had given them (Thomas, 2006). To prevent a stagnant caseload in the WLC it was necessary to seek another means of working that would allow movement of patients from active face to face contact and provide a means by which weight loss could be maintained to ensure effective governance.
Figure 3.1 Patient flow through weight loss clinic

Patient referral shows comment of learning disability/ binge eating disorder/ assessment for bariatric surgery. Transfer to relevant dietetic clinic.

Patient referred from GP or Consultant
BMI ≥ 30 kg/m²

Patient sent letter to invite them to telephone for mutually convenient appointment

Assessment appointment
Dietary advice provided as suitable to patients needs

Follow up appointments made every 4 – 6 weeks as appropriate

Attendance continues at WLC until patient reaches a minimum of 5% initial weight loss or the weight loss stops

At weight stability post >5% weight loss, discharge plans and weight maintenance discussions begin

Discharge to primary care for further support
3.4 Research Design
This study sought to measure and compare outcomes after the participants received different interventions. The primary outcome was the maintenance of weight loss within a defined range. Therefore, the outcomes can be quantified and as such the research design was quantitative. A randomised controlled study was selected as it allows comparisons to be made between a group who had one test intervention (contact with a dietitian by e-mail) and other group who received control treatment.

Random allocation to the comparison groups allowed participants to have the same chance of receiving the intervention thereby reducing bias.

In addition to having quantifiable results, this study generated data about the attitude and experience of participants both in the intervention and control groups. This more subjective and interpretative data required a standardised method by which information could be captured. As participants in the intervention group were communicating by e-mail with the researcher, compilation of their comments to the researcher during the study and written comments on the use of e-mail at the end of the 6 months was kept.

The study followed the guidelines of the Consort statement for improving the quality of reports of randomised trials (Moher et al., 2001).

3.5 Participants
3.5.1. Location
Participants were recruited from the WLC at an acute general NHS hospital located on the South Coast of England. All patients attending this clinic initially had a BMI>30 and some also had a variety of co-morbid conditions e.g. type 2 diabetes, hypertension, sleep apnoea, joint and mobility problems.
3.5.2. Eligibility
All participants who had successfully completed a weight loss programme (measured by a degree of weight loss ≥5% loss of initial body weight and where their weight loss had begun to slow) through the WLC and had access to e-mail were eligible for the study.

3.5.3. Exclusion Criteria
Some patients referred into the WLC may require bariatric (obesity) surgery or have Binge Eating Disorder (a recognised eating disorder). In these two cases patients were excluded from the study. Binge eating control is the primary focus of treatment for the latter disorder, and this was offered by another dietetic team within the service. Those who are about to undergo, or who have received obesity surgery have other factors rather than dietary control affecting their ability to lose weight. These participants were either screened from the WLC at referral (see Figure 3.1) or after dietetic assessment when the full details of the patient’s obesity were established, then they were either transferred directly to an alternative clinic of if awaiting bariatric surgery they were still held in the WLC (due to current local NHS funding policy) but were noted as not suitable for the research study and their record cards marked as such.

People with learning disabilities are not seen at the WLC as there are specialist dietetic clinics in the area; they are therefore excluded from the study by default, rather than by intention.

Individuals who were taking weight loss medication (Orlistat – lipase inhibitor or Sibutramine – appetite suppressor) were also excluded from the study as the ability to maintain body weight could be affected by the medication rather than dietary or activity levels and the prescription of these medications were not under the control of the researcher but of the local General Practitioner.
3.5.4. Consent

All participants approaching meaningful weight loss (≥5%) and slowing weight loss velocity were informed about the study and asked if they had access to e-mail. If they had e-mail access, they were asked if they are interested in the project. The study was described and an information sheet provided (Appendix D). Recruitment to the study took place at the following meeting. Although initially a separate clinic was planned to prevent disturbance to the standard WLC, in operation, the numbers being recruited or assessed at the end of the individual study period never warranted a separate clinic. Participants in the weight loss maintenance study were seen within specific appointments allocated within the normal WLC. Participants were more than happy to attend their familiar WLC setting, day and time. Consent was sought at a follow-up appointment (See Appendix E) and the form completed and signed by the individuals before they were 'enrolled' in the study. A photocopy was made and given to the subject to keep.

Those allocated to the intervention group were provided with specific instructions on how to address the e-mails into the hospital system and to meet with governance requirements had to sign a consent form to confirm that they had been made aware of the insecure nature of electronic mail (Appendix F).

The participant’s General Practitioner was told by letter of their involvement in the weight loss maintenance study with a request that the researcher was notified of any change in the person’s health or medication affecting weight (Appendix G). Consent for this information sharing was included in the overall consent form and was explained to the participant.

Participants who were not eligible or who did not consent were discharged from the clinic as per department policy. Previously, patients who had successfully lost weight to a clinically acceptable level (≥5% initial body weight) in the WLC were
normally discharged from the clinic with encouragement to monitor their weight regularly and to access primary care should problems arise. This prevents the WLC becoming overloaded with patients seeking ‘ideal’ body weights that are difficult to achieve in a discrete treatment period. However, it is important to stress that participants being discharged from the WLC would be provided with eating and activity plans similar to those used in the study, and given a weight card for regular weight monitoring.

3.6 Ethical Considerations
The research aimed to assist people in maintaining a weight loss to reduce their health risk and as such potentially has beneficence, to both arms of the study because as mentioned before the usual course for individuals is to be discharged and receive no follow up from the WLC. Although it could waste peoples time it does allow them professional contact, so if their individual situation deteriorates they are still ‘in the system’ unlike those who are discharged.
The study was submitted to the Isle of Wight and South East Hampshire Ethical committee for approval, as well as the University of Surrey Ethics Committee and the Research and Development Unit of the local NHS Trust, before commencement. Ethical review and approval was obtained from both the University of Surrey and the Isle of Wight/ South East Hampshire committees (Appendix H). The Research and Development Unit also approved the study taking part on site. The researcher obtained written informed consent from each individual taking part in the project.

Each person in the intervention group was asked to sign the “use of e-mail” consent form (Appendix F) and it was explained that the e-mail system could not be guaranteed to be secure. As patients are sharing their body weight in this e-mail, they were made aware that messages can be re-routed accidentally or be lost due to system failures.
The use of the NHS email system by external agencies such as patients was not common place in the Trust when the study design was being discussed. It required a full meeting of the management board of the Information Technology (IT) Department to consider their position and as a result the policy allowing access to hospital email addresses from outside the Trust was rewritten. Therefore, the IT department of the local NHS Trust (IPHIS) approved the study and the consent form for use of e-mail.

Discussing weight concerns can be difficult for people. However, individuals know the researcher from the WLC and they have a positive approach to discussing this sensitive subject. The researcher is a dietitian, with 25 years experience of dealing with weight issues, and is therefore considerate of the problems that can arise. It is recognised that some patients may need, or feel an obligation, to please the researcher by taking part and doing well in the study. This was managed, as far as possible, through discussions prior to signing the consent form at the start of the research.

### 3.7 Randomisation
Consent and information on weight maintenance control was discussed (including completion of questionnaires) before each person was randomised to their experimental group. Randomisation was a crucial part of the methodology as it meant that all participants had the same chance of being assigned to the study group (Altman, 1991). It was important to ensure that the researcher did not influence the allocation process and as all patients eligible for entry into the study knew the researcher very well, it was an area of potential bias. However, all patients had lost equal to or above 5% of their initial body weight to a maximum of 20% therefore, with randomisation the groups were balanced at baseline. Through
random allocation it was expected that the groups would be more likely to be similar at the start of the study.

Allocation rules were discussed with the statistician and a series of random numbers to a maximum of 60 were generated by Excel. From this list of numbers allocation was made in groups of three to email and control groups alternately. The numbers were then put in sequential order and the allocation was placed in consecutively numbered sealed opaque envelopes. Envelopes were opened by the researcher. See the attached table (Table 3.1) to illustrate the randomisation and grouping. This restricted randomisation was used to try and keep numbers in the active and control groups as close as possible (Jadad, 1998)

<table>
<thead>
<tr>
<th>Random number</th>
<th>Email/ control Grouping</th>
<th>Sequential Series for Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>C</td>
<td>1 = E</td>
</tr>
<tr>
<td>36</td>
<td>C</td>
<td>3 = E</td>
</tr>
<tr>
<td>5</td>
<td>C</td>
<td>5 = C</td>
</tr>
<tr>
<td>1</td>
<td>E</td>
<td>7 = E</td>
</tr>
<tr>
<td>7</td>
<td>E</td>
<td>9 = E</td>
</tr>
<tr>
<td>3</td>
<td>E</td>
<td>12 = C</td>
</tr>
<tr>
<td>48</td>
<td>C</td>
<td>13 = E</td>
</tr>
<tr>
<td>12</td>
<td>C</td>
<td>22 = C</td>
</tr>
<tr>
<td>23</td>
<td>C</td>
<td>23 = C</td>
</tr>
<tr>
<td>9</td>
<td>E</td>
<td>36 = C</td>
</tr>
<tr>
<td>13</td>
<td>E</td>
<td>48 = C</td>
</tr>
</tbody>
</table>
3.8 Intervention

3.8.1. Weight Management Information

All participants taking part in the study were provided with a weight record card (See Figure 3.2) and encouraged to record their weight weekly and to keep within an agreed weight band, this was specific to each person. Individuals were encouraged to weigh themselves weekly at the same time of day, in the same clothes and on the same scales. Weight could be recorded in imperial or metric weight according to individual preference. The weight band was within a ±2kg range of their finishing weight when they left the WLC, as derived from the research of StJeor et al., (1995). If the participant was familiar with imperial weight then the weight band was set using a ±4 lb. This ensured that individuals could monitor their weight adjusting for relatively small changes. From the study by Stevens et al., (2006), it is known to be beneficial to assist each person maintaining their weight to preserve their weight loss ≥3% initial body weight lost. Having a top weight band set at 2kg above finishing weight and was chosen to try and ensure that individuals maintained their weight loss within this desirable target.

Techniques for managing weight increases, such as checking their current dietary intake and exercise level, changes to medication or being unwell, low in mood etc., were discussed and strategies agreed. These strategies were designed to increase self efficacy being developed specifically around a given set of health behaviours (e.g. eating a low fat diet, being more active). Self-regulation skills, such as self monitoring and problem solving, were techniques that the researcher provided to specific issues helped to establish stronger self efficacy by building on the behaviour change theory of Bandura (1997).
A list of targets for individual eating and activity plans were agreed and drawn up on individual plans (Appendix I). These were based on the National Weight Control Registry research in the USA (Wing and Hill, 2001) where low fat intake to approx 30% of total energy is required, inclusion of breakfast, balanced dietary intake with overall reduced energy intake and regular activity. The researcher also used the information on dietary change that the patient had used to date to achieve weight loss. So for example, if a patient had used 'Ready Meals' to some success in helping with portion control, then this was included in their dietary plan. Consideration was also given to times of dietary challenge such as Christmas and holidays. Coping strategies for particular problems, such as low mood, friends and family who tempt them, etc., were discussed and noted on the eating plans. Techniques that individuals had used with some benefit, to deal with their own situations were also added to the plans to remind each participant of their previous success.

An improvement in activity levels was supported by the activity plan. This included recording their current activity levels and any plans to improve this such as amount of time walking in a day, number of steps taken in a day etc. However as dietitians are not qualified to recommend prescriptive exercise, a more general improvement in activity was made on the plan. For example, aiming to walk more, use the stairs and not the lift, cycling, dancing etc. Encouragement was made to increase activity in 15 minute episodes; however no target for activity was set. Each participant had the goal to maintain their level of activity on entry to the study throughout the six months.

Individuals were also asked to complete a questionnaire (Appendix J) on their attitudes to weight loss management based on the work of Klem et al., (2000). This is a quantitative tool to elicit how much effort each individual put into managing their
new weight level by using a numeric scale (Likert scale). This was repeated after the six month research study.

An additional questionnaire devised by the researcher was given to all patients addressing specific items that they were currently eating e.g. low fat products, number of portions of fruit and vegetables eaten within a day, eating breakfast regularly, the number of fifteen minute periods of exercise per week etc. (Appendix K). The aim of this questionnaire was to assess specific dietary changes and the nutrition education that had been completed over the treatment period. These dietary changes are known to be beneficial in weight loss maintenance (Wing and Hill, 2001) and were assessed both before and at the end of the study period. This questionnaire was not been formally validated but it is based on clinical experience and has been used primarily as a means of assessment of the current diet, allowing each subject to receive the same questions. This was not used before in the treatment process with the participants, but the questions are based on the dietary plans that were discussed with them in preparation for maintenance.

After each participant was provided with this information and completed the baseline questionnaires, they were randomly assigned to either the intervention or the control group. See section 3.7 for details of randomisation.
Figure 3.2 Weight chart showing upper and lower tramlines

Weight Card

Each week you should record your weight using:

- The same set of scales
- In the same type of clothing
- At the same time of day
- Record your weight on the graph below. Remember to keep in the tramlines of your upper and lower weight band.
3.8.2. Intervention Group

For those allocated to the intervention group the researcher explained the use of e-mail and the contact they would have via this medium over the next 6 months.

The researcher contacted members of the intervention group via e-mail every week, using a group blind copy e-mail (to prevent e-mail address sharing). This weekly contact was in the form of ‘Tip of the Week’. These tips centred on the techniques known to be effective in weight loss maintenance e.g. low fat eating, eating breakfast, label reading, being more active, education on energy values etc. A complete list of all ‘Tips’ is available in Appendix L, however; table 3.2 shows a selection of these.

In addition each month (every calendar month since enrolment on the study), the researcher contacted each participant in an individual e-mail to ask specific details of body weight and any problems or successes that they were experiencing.

Each email was addressed with the heading of Tip of the Week or ‘WLMP’. Each email came from the researcher’s NHS address and was signed with the researcher’s details. The NHS IT department were specific on what they would allow on the email (Appendix F). A disclaimer at the foot of the email emphasised the confidential nature of the email. If emails had gone astray the disclaimer asked for them to be returned to the sender.

Details of each individual’s current weight, information regarding any problems and the general nature of their diet were provided to the researcher. Detailed food record/ diet diaries were not required. Information sent in via e-mail regarding weight and any problems or successes experienced, were reviewed within 48 hours during the working week and information returned to the sender on how to manage any particular issues e.g. parties, illness, low moods etc. where weight might increase.
Each participant's weight band was kept on file so that the researcher was aware from each email received whether the weights quoted were on target or not. If the researcher was away the sender would always receive an 'out of office' auto reply to avoid individuals feeling 'neglected'. All information, received or issued, was recorded and kept in hard copy on the individuals' research file. Electronic copies were also kept on the researcher's computer files.

3.8.3. Control Group
For those allocated into the control group, the researcher explained that control participants would receive no contact from the Dietetic Department during the six month period of the study. However, should they decide to use a commercially available weight loss programme or be placed on medication (for whatever reason) etc., they were to let the researcher know so that it could be recorded and taken into account in the analysis phase of the study.

3.8.4. Exit Interview at 6 Months
At the end of each participant's six month study period, both intervention and control group members were contacted and invited to attend the WLC for an assessment of their progress with regard to their weight and eating and activity plans. This appointment was made to suit each individual. All participants were invited to call the Department of Dietetics to make an appointment with the researcher at a time convenient to them. The majority booked a time within the normal WLC sessions, but chose a time at the end of the clinic which allowed some freedom to complete the forms and discussions. If participants did not respond to this initial request the researcher tried to telephone individuals to try and engage them to arrange a date to meet.

At this meeting, any difficulties experienced were discussed and noted. Details of their present weight were recorded and the relationship of that to their weight at the
start and end of the WLC was discussed. Their current diet was reviewed using their eating plans (Appendix F) and the diet questionnaire (Appendix K). Similarly, current levels of activity were compared against the activity plans completed at the start of the maintenance phase. All successes and achievements were noted and discussed. Participants were given a questionnaire on attitudes to weight loss management and their dietary change adherence, for completion (Appendix J). These were the same questionnaires issued at the start of the 6 month period (see section 3.7.1). Any particular issues that had occurred during the six months were noted. For example: illness, low mood, plus difficulties in weight loss maintenance etc.

Participants in the intervention group were asked to describe their feelings about the email contact and the ‘Tip of the Week’ e-mail. Their attitudes, feelings and comments were documented during the interview and used as part of the qualitative analysis.
**Table 3.2 A selection of ‘Tip of the Week’**

<table>
<thead>
<tr>
<th>Date</th>
<th>Tip of the Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>26/01/07</td>
<td><strong>Hope you are all well.</strong> The tip this week - Make a shopping list before you go food shopping, don't cruise the aisles looking for tempting treats especially when hungry. Sit down before you go shopping and think about the week ahead. What are your main meals likely to be? Then plan to buy the relevant foods for preparing these meals. Remember buy one get one free is false economy, when you are eating foods just because you had them 'free'. They are not free when you increase your weight by another few pounds and clothes do not fit!</td>
</tr>
<tr>
<td>07/02/07</td>
<td><strong>Cold weather makes you want to eat more, so be careful!</strong> Cooked vegetables have the same energy value as salads. So make half your plate cooked vegetables and remember that instant gravy is relatively low in energy and therefore will make a warming dinner and this will still be within your calorie limit.</td>
</tr>
<tr>
<td>14/02/07</td>
<td><strong>Have you got a sweet tooth? With Valentines Day you may want to eat chocolate, but it is so high in calories. The lowest calorie chocolate treat is a Curly Wurly with a two finger Kit Kat coming a close second! Cadbury Option drinks are useful at 40 kcals. Marshmallows are low in fat as are wine gums (but watch the quantity of the latter)</strong></td>
</tr>
<tr>
<td>01/03/07</td>
<td><strong>I am sorry not to have been in touch last week, I was away on a half term break. I hope you are all checking your weight, by keeping to the same time of day and weighing in the same clothes. Mark your weight on your weight chart and check how it fits with last weeks weight etc. Any changes in weight ask yourself what has changed from last week to this.</strong></td>
</tr>
<tr>
<td>07/03/07</td>
<td><strong>Hello, isn't the weather lovely today?</strong> Hope this finds you all well and the same weight or less than last week! <strong>Base your meals on starchy foods such as bread, cereals, rice, pasta and potatoes. Try to choose wholegrain varieties when ever you can. Portion sizes are important: 2 slices of bread, a coffee mug full of cereal, a tea cup of boiled rice, a coffee-mug of pasta and a potato the size of your fist.</strong></td>
</tr>
<tr>
<td>14/03/07</td>
<td><strong>Most of us should be eating more fish as it is a good source of protein and contains vitamins and minerals. Aim for 1 -2 portions a week and try and include some oily fish. Oily fish contain a certain type of fat called omega 3 fatty acids, which help to keep our hearts and our brains healthy. Oily fishes are: salmon, mackerel, fresh tuna, sardines, pilchards, eel. Bake or steam or grill the fish to reduce energy levels rather than frying or using a rich sauce.</strong></td>
</tr>
</tbody>
</table>
| 20/03/07   | **To stay healthy we need some fat in our diets. What is important is the amount and type that we eat. Saturated fats can increase your cholesterol and increase your chance of heart disease. Foods that are high in saturated fats are:**
|            | Meat pies, sausages and meat with visible fat
|            | hard cheese
|            | butter and lard
|            | cakes and pastries
|            | biscuits
|            | cream, soured cream and crème fraiche
|            | coconut oil, palm oil and coconut cream.
|            | For a healthy choice use just a small amount of vegetable oil or reduced-fat spread instead of butter or lard. When you eat meat chose lean cuts and try reduced fat cheeses. It is best to make cake, pastry and biscuits for high days and holidays only!! |
| 29/03/07   | **Here is this weeks Tip!!** With the warmer weather we should try to drink 6- 8 glasses of water or other fluids a day. Fluids can be plain water, tea or coffee. You can also drink low sugar cordials and fizzy drinks but take care over fruit juice. Only one glass per day as it is high in energy and sugar.** |
|            | **Water is best and it is cheap!!** |
Table 3.3 Details of the exit interview completed after the 6 month period of weight loss maintenance.

<table>
<thead>
<tr>
<th>Exit Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention Group and Control Group</td>
</tr>
<tr>
<td>• Weight check</td>
</tr>
<tr>
<td>• Review of eating and exercise plan</td>
</tr>
<tr>
<td>• Completion – weight control strategies questionnaire</td>
</tr>
<tr>
<td>• Completion of pleasure and effort questionnaire</td>
</tr>
<tr>
<td>• Experience of use of email discussed (for intervention group only) &amp; maintaining weight over 6 months</td>
</tr>
</tbody>
</table>

3.8.5. Further Support
All participants were asked what they required in terms of further support. For those that had gained weight an offer of further dietary treatment was made. Those requiring continued e-mail support or those wishing to try it were offered this type of support.

Participants who did not request continued contact were informed that they could access primary care for further support, at any time in the future. Discharge from the WLC was then completed as per department policy.

3.9 Study Design
Figure 3.3 shows the subject flow through selection and recruitment until the study end.
Assess eligibility for study:

Weight loss ≥5% of initial body weight & access to e-mail. Information provided about the study.

Excluded if waiting for bariatric surgery, continuing on weight loss medication & refusal to participate.
Standard treatment provided, as per dept. guidelines.

Recruitment to the study completed, including consent form, completion of eating & activity plans and questionnaires.

Randomised

Allocated to Intervention Group

Email consent form completed & E-mail contact established

Intervention:
Weekly contact for 'Tip of the Week' and Monthly contact for Weight records and individual

6 monthly follow-up.
Progress reviewed over six months on weight, eating and activity targets. Attitudes to management noted

Allocated to Control Group

Control:
No dietetic contact

6 monthly follow-up.
Progress reviewed over 6 months on weight, eating and activity targets. Attitudes to management noted

Analysis of results

Figure 3.3 Participant flow through the study period
3.10 Sample Size
Using the paper by Tuobro and Astrap (1997) it was decided that the proposed
difference between the intervention and control group should be a 5kg weight
difference. The paper by Tate et al., (2001) calculates a sample size using a
difference of 2.27kg between the two groups, which gave a sample size of 74. An
alpha level of 0.05 and a power of 80% were thought to be appropriate and were
used in the Tate study. However, Mr Higgins (statistician from University of
Portsmouth) approved a power calculation using an effect size of 5kg (±0.8 SD)
gave a sample size of 24 for each group to detect a 5 kg difference between the
groups. Assuming an attrition rate of 30% increased the sample size from 48 to 70
(Appendix L). An examination of the throughput of patients at the WLC suggested
that the sample size would be achieved, within 12 to 15 months.

3.11 Blinding
Due to the nature of the intervention it was not possible to protect the trial against a
bias by keeping the researcher unaware of the identity of the experimental group.
There was one period in the process where a strategy could be introduced to reduce
bias and that was to teach the techniques of weight maintenance and devise the
individual eating and activity plans before allocation occurred. Therefore each
participant was taught in the same way how to record their weight and what steps to
take in controlling weight gain and how to tackle specific weight control issues. After
this each participant was allocated to intervention or control arms of the study.
However, from that point onwards the researcher was aware of the identity of those
in the intervention group. No one refused to enter the study at that time and
therefore it was assumed that all were happy with their allocation.

3.12 Analysis
Data was initially held on Excel spread sheet for each subject; including details of
weight before and after treatment and percentage weight loss of initial weight on
entry to the study. Body Mass Index was also recorded, plus the type of diet used. The control group had the results of their exit interview recorded in terms of weight at 6 months, BMI and percentage weight loss maintained. The intervention group had the same information recorded, plus the number of emails that had been received from them. A separate spread sheet was used to record details of the pre and post study dietary and exercise plans, plus the effort rating scales.

Details of the exit interview for all participants were logged in a Word document, where each subject had an individual page. Information regarding details of their experience over the study period was logged. Comments about the email system, general health, etc. were all noted. Each page of information was given a different coloured font to allow easier handling of the qualitative data.

Once all participants had been through the exit interview at 6 months the Excel data sheets were ‘cleaned’ and missing values assigned and coded as 9999. Numeric codes were set up for Sex (0 = female; 1 = male); Group (0 = control; 1 = Intervention); Affirmation of breakfast eating, low fat etc (Yes = 0; No = 1); Frequency of Weighing, exercise etc (Daily = 0; Weekly = 1; Monthly = 2; Never = 3) etc. At this point, data fields were established in Statistical Package of Social Sciences (SPSS) (version 14 for Windows: Chicago, Illinois) to transfer data to the system for analysis. All data was listed according to group and arranged in numeric order.

3.13 Statistical Methods
All statistical calculations were made using the SPSS (Statistical Package for the Social Sciences) (version 14) computer package (Chicago, Illinois).

The data were checked for normality using the Kolmogorov-Smirnov test. For the data giving a significance of <0.05 it was not normally distributed and therefore non-
Parametric tests were used i.e. Mann-Whitney u test (instead of t-tests), Wilcoxon matched pairs (instead of paired t-tests) and Kruskal-Wallis (instead of ANOVA).

Each subject has an overall weight loss that they aimed to maintain over the 6 month study period. Absolute weight loss was calculated by subtracting the body weight at the end of the six month study period from the weight at initial presentation before treatment. The means achieved in both groups for weight loss achieved pre and then post study period, were compared using Mann-Whitney u test. In addition the mean weight loss achieved at entry was compared in each group against the amount of weight loss at exit to assess the change over time.

As the aim was for participants to maintain weight within a ±2kg weight band adherence to overall maintenance was assessed using a Chi squared test as the data was non-parametric. This allowed the results to be categorised into those falling into the weight band and those being above or below the weight band, and then compared against each other.

Comparisons between the various targets (dietary and exercise) in weight loss maintenance was correlated against the amount of weight loss maintained. The effort scoring was recorded and Mann-Whitney and Wilcoxon matched pairs were calculated to compare the difference on entry and exit from the study, and change over time in each group.

Pearson or Spearman Rank correlations (for parametric, and non-parametric data) were undertaken between change in weight over the six month study period was made against intake of fruits and vegetables, episodes of exercise, breakfast eating and frequency of log-in (in the intervention group only).
In addition, a review of the comments made about the experience of weight loss management and the experience of using email was made by looking at common themes between participant's responses.

### 3.14 Management of E-mails and Tips of the Week

As the research developed the management of the number of emails needing to be tracked and sent out was challenging. The group email used for sending the 'Tip of the Week' required checking to ensure new participants were added to the list. It was vital not to rush the process of compiling the email of 'Tip of the Week' as it was very easy to slip the group email address into the 'to' field rather than the 'bcc' field.

By August 2007 there were 18 people regularly receiving the 'Tip of the Week'. Depending on the weekly activity of the researcher the regularity of the 'Tip' was affected. It was intended that the 'Tip' would be issued on a Friday. Sometimes the 'Tip' was issued on a Monday if it had not been sent on the Friday. Also if the researcher took holiday then there was a gap in the issue of a 'Tip'. This meant that at 15 months 53 'Tips of the Week' had been issued. Appendix L shows that there were some repetitions in the content but in general each one was individual. Deciding on the 'Tip' and typing it into the email system took an average of 5 minutes. The researcher devised two lists of different dieting suggestions and these fuelled 15 weeks of 'Tip of the Week'. By the end of the 15 months the researcher was asking other dietetic colleagues to assist in devising new ideas for the 'Tip'. Hence the average time of 5 minutes as some weeks it took 15 minutes to research for the information provided in the 'Tip' (especially energy values). Other times the information was more accessible and so the time was as low as three minutes.

The individual email to patients required accurate management, to ensure that all patients were emailed each calendar month. A system was kept using a diary. Each week on the Microsoft Outlook calendar, a list of patients would be held on the
notepad to instruct the researcher to email that individual during the week to ask for their weight. This was usually completed on the same day (Friday) as the 'Tip of the Week' was issued. The researcher sent out emails to participants four weeks apart regardless of whether a response had been received. However participants did not respond to emails promptly. Some did not respond at all until the next message was sent (and as such missed one month's contact) others took one to two weeks to respond. Therefore when the results are investigated it shows that some patients only had three or four individual contacts by email over the six months.

This additional email contact would take a matter of two minutes to type into the system. However, responding to additional emails returned and storing them etc., increased the time to an average of four minutes per person per month. Calculation of the time is shown in table 3.4.

**Table 3.4 Time taken to manage the email system**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Individual Time (minutes)</th>
<th>Time Taken Across the Study (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tip of the Week</td>
<td>5</td>
<td>53 × 5 = 265</td>
</tr>
<tr>
<td>Monthly email contact</td>
<td>4</td>
<td>6mths × 4 = 24</td>
</tr>
</tbody>
</table>

**3.15 Qualitative Analysis**

As part of the exit interview participants were asked to feedback their experience at using email (Intervention group) and both groups were asked of their issues with using the diet and activity plans over the past six months and experience of trying to maintain weight loss during the study period. They were also asked what they required in the way of further support following the ending of the study.
All feedback was written verbatim as individuals discussed their experiences. The feedback was structured when using the questionnaires for dietary changes and for effort and pleasure rating. However, to assist the collection of data the researcher used a series of prompts to facilitate responses. These were:

- Could you tell me about your experience with using email?
- Were there any particular issues with the use of email?
- What did you think of the 'Tip of the Week'?

For all participants the exit interview asked:

- How did you manage over the last 6 months with your diet and exercise plans?
- What difficulties have you experienced in trying to manage your weight loss?

In addition all email responses received from participants in the intervention group were collated and read through for thematic analysis as described below.

3.16 Analysis

It was decided to analyse the data using a methodology based on a practical thematic analysis framework as this allowed each comment made by participants to be grouped into a theme. (Aronson, 1994; Miles and Huberman, 1994). All the responses given by participants, whether in face to face contact or via email were colour-coded by individual and the researcher read and re-read the comments given. Frequently occurring themes were then highlighted and each supporting comment placed under the theme. From this 9 main themes were established with four themes generating sub themes.

From these themes an understanding of the attitudes and experiences of those using email will be established.
3.17 Conclusion
The methodology combines two distinct paradigms and all aspects of the research method have been considered to ensure the most accurate data is obtained. Data was collected throughout a 15 month period and none of the data was ‘cleaned’ or analysed until March 2008, to prevent bias on the part of the researcher.
Chapter 4: Results

4.1 Introduction
This chapter sets out to fully analyse both the quantitative and qualitative results obtained during the research study. The demographic data of the cohort are considered as well as the baseline data on entry into the study to assess for the quality of the randomisation process. The quantitative analysis is then split into two groups, to analyse the effect of the intervention and to test the hypothesis. Further analysis looks at the effect of behavioural targets on weight loss maintenance for the whole group.

The second half of the results concentrates on the qualitative data, providing insight into the feelings and experiences of the intervention group on the use of email; plus the feelings of the whole group on trying to maintain weight loss over a six month period.

4.2 Hypothesis
The apriori hypothesis to be tested is:

That in patients who were obese and have achieved a weight loss of >5% of their initial body weight, there will be a significant difference in weight loss maintenance in those who, following the weight loss period, have maintained contact with a dietitian through email compared to those who have no contact.

4.2.1. Specific Objectives of the Study
- To compare over a six month period, in individuals who have achieved similar weight loss, whether maintenance of weight loss differs in individuals who have access to dietetic support via email compared to those who do not.
- To identify by means of a questionnaire which factors either encourage or inhibit self-management of weight maintenance (consumption of breakfast,
amount of fruit and vegetables eaten, eating a low fat diet, frequency of self monitoring of body weight, undertaking regular exercise) in participants who have successfully completed an NHS weight loss programme.

- To conduct interviews to assess the personal experience of using a remote communication method (email) between participant and professional.

4.3 Recruitment

Patients were eligible for entry into the study having achieved a weight loss of ≥5% of their initial body weight at referral to the WLC and where further weight loss was beginning to slow or stop. Currently, the Department of Dietetics policy is to discuss treatment goals with patients as they approach meaningful weight loss, or where weight loss is slowing. Discussion about weight loss maintenance takes place and the patients are discharged back to primary care for long term monitoring.

Seventy three patients reached a meaningful weight loss with weight loss velocity slowing during the recruitment phase. Of this number, 18 had no email access. Therefore, a total of 55 patients (12 males and 33 females) were eligible for entry into the study during the recruitment phase, which took place between November 2006 and October 2007. By October 2007, fifty five patients had reached eligibility for the study and all were willing to take part in the research (there were no refusals). They were provided with their personal eating and activity plans and taught how to monitor their weight in a personalised weight band. They were then randomly assigned to either the intervention or control arm of the study. See section 3.7 for further details.

It became increasingly hard to recruit to the study between December 2007 and January 2008 (this had also been experienced in 2006/7). The Christmas period exposes participants to times of dietary indiscretion and therefore when weight loss maintenance was discussed with patients in November and December 2007 many
participants felt the need for the security of attending the WLC after the festive season to check their ability to maintain weight, before being formally discharged or entering the study. Entry into the study at February or March 2008 meant that they would not exit the study until August - September 2008 which was outside the study period. Therefore, by February 2008 the researcher checked that the sample size could be met without further recruitment. Despite allowing for an attrition rate of 30%, few participants (6) failed to complete the whole study and as such the sample size was achieved in both arms of the study by March 2008 and the study was closed at that time.

Figure 4.1. Participant flow through a weight maintenance study
4.4 Characteristics

Figure 4.1 shows the participant’s pathway through the study. Of the 55 recruited, 27 were allocated to the intervention arm of the study and 28 to the control arm. During the study one member of the intervention group failed to respond to any email contact from approximately half way through the six month period. An invitation to attend for post-study check and discussion of progress, which was sent by post to the home address at the end of the six months, drew no response. A follow up letter asking for the participant to make contact also drew no response. The other individual, who failed to respond, maintained regular email contact until month five. At this time, the participant informed the researcher of a domestic move to London, resulting in a gap in contact due to disconnection from computer services. Email contact was renewed at month seven, but gave neither postal address nor any other contact material. A return email asking for telephone contact drew no response and as such by month eight it was deemed inappropriate to pursue his results further.

Four of the control group failed to attend follow up at six months. All of them were sent a letter asking them to make contact to arrange an appointment, which would be convenient to them, for assessment at six months. All four failed to respond and despite a further letter repeating the request, no one contacted the department.
Table 4.1 Demographics for participants enrolled in a weight maintenance study

<table>
<thead>
<tr>
<th></th>
<th>Intervention Group</th>
<th>Control Group</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number entered</strong></td>
<td>27</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>23</td>
<td>Females</td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>4</td>
<td>Males</td>
<td></td>
</tr>
<tr>
<td><strong>Age (years) (Mean ± SD)</strong></td>
<td>43.2 ±15.23</td>
<td>46.2 ±12.0</td>
<td>ns*</td>
</tr>
<tr>
<td><strong>Age Range (years)</strong></td>
<td>17 - 71</td>
<td>18 - 78</td>
<td></td>
</tr>
<tr>
<td><strong>Number at exit (M:F)</strong></td>
<td>25 (3M:22F)</td>
<td>24 (6M:18F)</td>
<td></td>
</tr>
<tr>
<td>% of initial recruitment number</td>
<td>93%</td>
<td>86%</td>
<td></td>
</tr>
<tr>
<td><strong>Median Weight (Kg) on entry to the study. (IQR)</strong></td>
<td>86 (38.2)</td>
<td>91.9 (39.7)</td>
<td>ns$</td>
</tr>
<tr>
<td><strong>Median BMI on entry to the study (, IQR)</strong></td>
<td>33.1 (10)</td>
<td>32.7 (10)</td>
<td>ns$</td>
</tr>
<tr>
<td><strong>Median Body weight loss achieved (%) prior to entry into the study(, IQR) (Range)</strong></td>
<td>11 (8)  (6 – 20)</td>
<td>9.5 (7)  (5 – 22)</td>
<td>ns$</td>
</tr>
</tbody>
</table>

*ns non significant parametric t-test

$ ns non significant non-parametric Mann Whitney U test

Baseline characteristics of the two groups are shown in table 4.1. A total of 49 participants completed the trial, with 6 being lost to follow up (intervention group: 1 male; 1 female and control group: 2 male; 2 female). The mean body weight, BMI and percentage weight loss achieved by all participants at entry to the study were not significantly different (as tested by Mann Whitney U test) indicating that the randomisation process had been successful.

To enable the results to be analysed fully, the chapter has been split into two sections: Quantitative and Qualitative.
4.5 Quantitative Analysis

4.5.1. Entry to the Study

Figure 4.2 shows the range of ages in the intervention and control groups. There were three individuals, all female, who were over 70 years old. In the control group, there is one outlier with an age of 78 years old. The oldest participant in the intervention group was 71 years. The mean age in the two groups was not significantly different \( (p = 0.45) \).

Figure 4.2 Comparative age at entry into weight maintenance study, after randomisation

Figure 4.3 shows the comparative amounts of weight lost from active dietary treatment, in the randomised control and intervention groups, after randomisation.
The outliers in the control group (Figure 4.3) show that two individuals had lost over 20kg, losing 29 and 29.9kg, whereas in the intervention group 4 individuals had lost 25kg. However there was no significant difference between the mean absolute weight loss of each group prior to entry into the study (p = 0.499). Figure 4.4 shows the percentage of weight lost by each group at entry to the study.

Figure 4.3 Absolute weight loss (kg) achieved during weight reduction phase prior to entry to study
Figure 4.4 Percentage of body weight lost achieved at entry to the study

4.5.2. Testing the Hypothesis
To test the hypothesis that those in the intervention group will have significantly better success in maintaining achieved weight loss than those who did not have the intervention, a comparison of the amounts of weight lost and maintained after the study period in both groups were compared.

4.5.3. Study Definition of Weight Loss Maintenance
A full discussion of the issues concerning the definition of weight loss maintenance is given in section 2.11. For this study, it is important that a definition was adopted to allow analysis of the results. As mentioned in section 2.4.4., the issue is the differing amounts of weight loss as individuals move into the maintenance phase; however adopting a loss of 5% to be maintained, ensures a positive health benefit for
participants. If an individual enters weight loss maintenance having lost only 5% then adopting the weight band (± 2kg) as discussed will ensure that individuals meet the 3% target which was suggested by Stevens et al., (2006) as a clinically sound definition of weight maintenance.

4.5.4. Weight Changes
In order to explore whether there are any differences in the ability of participants to maintain their weight loss during the study period, the amount of weight lost by the intervention and control groups were compared using Mann Whitney U tests.

Table 4.2 Weight changes at entry to the study period.

<table>
<thead>
<tr>
<th></th>
<th>Intervention Group Median (IQR)</th>
<th>Control Group Median (IQR)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (kg) after weight loss prior to entry into the study</td>
<td>86 (38.2)</td>
<td>91.9 (39.7)</td>
<td>ns</td>
</tr>
<tr>
<td>Amount of weight lost (kg) prior to entry into the study</td>
<td>11.6 (7.9) (n=27)</td>
<td>9.5 (8.2) (n=28)</td>
<td>ns</td>
</tr>
<tr>
<td>% weight loss achieved prior to entry into the study</td>
<td>11 (8) (n=27)</td>
<td>9.5 (7) (n=28)</td>
<td>ns</td>
</tr>
</tbody>
</table>

There were no statistical significant differences between the two groups, for weight, the amount of weight lost and the percentage weight loss achieved, at entry into the study. The mean body weights of the two groups were also not statistically different six months later (Table 4.3).
Table 4.3 Weight changes on exit from the study period

<table>
<thead>
<tr>
<th></th>
<th>Intervention Group</th>
<th>Control Group</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (±SD)</td>
<td>Mean (±SD)</td>
<td></td>
</tr>
<tr>
<td>Median body weight (kg)</td>
<td>94.6 (38.5) (n=25)</td>
<td>97.1 (29.5) (n=24)</td>
<td>ns</td>
</tr>
<tr>
<td>maintained after 6 months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median amount of weight loss (kg)</td>
<td>9.6 (10.9) (n=25)</td>
<td>7.8 (5.9) (n=24)</td>
<td>0.12</td>
</tr>
<tr>
<td>maintained at 6 months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean % weight loss maintained</td>
<td>10.16 (±5.4) (n=25)</td>
<td>7.3 (±4.2) (n=24)</td>
<td>0.05*</td>
</tr>
<tr>
<td>at 6 months</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P value from t-test as data is parametric

At entry to the study period, the percentage weight lost, was similar for the two groups (Table 4.2), whilst at the end of the 6 month study period (Table 4.3) there was a significant difference between the percentage weight loss of the two groups (p= 0.05). The percentage weight loss was tested using t-tests as the data were normally distributed. On average the control group had maintained only 7% of their weight loss from their original weight whereas the intervention group showed a mean percentage weight loss of 10%. However the results for both groups meet the 5% suggested definition of weight loss maintenance given by Stevens et al., (2006) adopted for this study. This is also mirrored in the amount of weight lost, which was not significantly different between the two groups at entry to the study but, at the end, there was a greater difference between the two groups (10.9 vs. 7.8 kg) with the control group having regained more of the weight they had lost. Even so, this difference did not prove to be statistically significant between the two groups.
The weight loss maintained was calculated by comparing the body weight at the end of the six months study period, to the body weight at entry to the study and the effect this had on the initial weight loss (kg).

To demonstrate the effect of the intervention on the amount of weight loss maintained over the study period (the effect over time), a Wilcoxon matched pairs of the amount of initial weight loss against the amount of weight loss maintained at exit showed a significant reduction in the control group (p = 0.003), whereas this was non significant in the intervention group (p = 0.278). This suggests that the intervention was successful in reducing the rate of weight regain over a six month period in comparison to no professional support.

4.5.5. Weight Loss Maintenance in the Weight Band
Precise maintenance of the weight lost over 6 months is unlikely due to the normal fluctuations in body weight which occur. As described in section 2.11 weight maintenance is best described as maintaining weight within a weight band, which allows for some fluctuation around the exact weight loss achieved. Each individual was shown how to record their weight and plot it on a graph, with a 2kg weight band above and below their weight at entry into the study. More of the participants in the control group (45%) increased their weight outside the top range of the weight band compared to the intervention group (24%), as shown in Figure 4.5.

Conversely, four of the intervention group (16%) had exit weights that placed them below the weight band (reflecting weight loss) in comparison to only one (4%) of the control group.

Figure 4.5 shows the pattern of body weight in comparison to the weight band. In the intervention group 15 participants (60%) were in the weight band at exit interview in comparison to 12 (50%) in the control group. Overall 76% of the
intervention group were within or below the band in comparison to 54% of the control group.

Figure 4.5 Weight change (kg) maintained respective to weight at entry to study by group

Focusing on maintenance alone does not take into account the fact that some individuals continued to lose weight. This was not a primary aim of the study, but must be noted as it is of clinical importance. The continued weight loss by some participants increased their mean percentage weight loss and this proved significantly different between the two groups (p=0.05) at exit from the study. A comparison of individuals who had either maintained within their weight band or who
had continued to lose weight against those that had gained weight above the weight
band, was undertaken to identify differences between the two groups.

Table 4.4 Individuals weight at six months in relation to weight maintenance
band

<table>
<thead>
<tr>
<th></th>
<th>Intervention n=25</th>
<th>Control n=24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below weight maintenance band</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>(further weight loss)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In weight maintenance band</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>Above weight maintenance band</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>(increased weight)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Chi-Sq 3.585, p=0.167, Note violation of Chi sq test count

A chi-squared test was performed on those who were in, below or above the weight
maintenance band for each group. Table 4.4 shows that only one of the control
group was below the lower limit of the weight maintenance band. A chi squared test
should be used when the expected frequencies are > 5. In larger contingency tables
up to 20% of the expected frequencies could be <5 but there is a loss of statistical
power and as such the test may fail to detect a genuine effect. No expected
frequencies should be < 1. (Field, 2005) In this case the chi squared test does have
a frequency of one and another frequency < 5, as such the test cannot test for a
genuine effect.

The chi-square result is 3.585 (p = 0.167) and is non significant.
Table 4.5 Individuals weight at six months comparing those in the weight maintenance band and those above the band

<table>
<thead>
<tr>
<th></th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>In weight band</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>Above weight band</td>
<td>6</td>
<td>11</td>
</tr>
</tbody>
</table>

(incresed weight)

Chi-sq 1.717, p=0.228

Table 4.5 shows a repeat of the Chi-square removing the results of those falling below the band (continuing to lose weight) and improving the frequency level. However, the Chi-square result is 1.717 (p = 0.228) which is still not significant.

Figure 4.6 shows a box plot of the amounts of weight lost. From the graph, it is clear more members of the control group regained weight lost, minimising the gap between their weight at six months and their original body weight. Although this also happened in the intervention group, it happened to a lesser extent, with more remaining within their maintenance band. As was shown earlier the rate of weight regain in the control group was statistically significant (p<0.01). Of note are the two outliers in the control group, who had lost more at the entry to the study than the rest of the group. One of these did not attend for follow up and therefore the final weight could not be recorded.
The study hypothesis was that patients who had achieved a weight loss of ≥5% of their initial body weight and maintained contact with a dietitian via email for six months will have significantly better success in maintaining the weight loss achieved when compared to those who do not have email contact. The results above do not support this hypothesis, as the intervention group was not significantly better at maintaining weight loss than the control group (as defined by the ability of each group to maintain their weight within the specified weight band). However, whilst not statistically significant, there is evidence that the intervention group were better at maintaining their weight loss to a clinically significant level, with more of this group continuing to lose weight during the 'maintenance' phase and hence further reducing their health risk. The reduction in the amount of weight loss maintained (weight
regained) in the control group over the six month study period was significant and as such raises questions about the ongoing results for this group.

4.5.6. Characteristics of Weight Maintenance
The second aim of the study was to investigate which factors encouraged or inhibited self-management of weight maintenance.

Before entry into the maintenance study, each participant was asked to complete a questionnaire enquiring about their dietary choices, weight monitoring and exercise patterns. These were characterised as described in Chapter 3 Section 3.8. This questionnaire was repeated at the six month exit interview. Results of the dietary characteristics of both groups are listed in Table 4.6.
Table 4.6 Dietary and behavioural characteristics of participants compared between groups at the entry and exit to a weight loss maintenance period of 6 months.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Baseline measures</th>
<th>Mann Whitney U test</th>
<th>Exit measures</th>
<th>Mann Whitney U test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control</td>
<td>Intervention</td>
<td>P value</td>
<td>Control</td>
</tr>
<tr>
<td>Median intake of fruit and vegetable portion (IQR)</td>
<td>4 (2)</td>
<td>4 (2)</td>
<td>ns</td>
<td>1.7 (2)</td>
</tr>
<tr>
<td>% eating breakfast daily</td>
<td>100%</td>
<td>93%</td>
<td>0.15</td>
<td>75%</td>
</tr>
<tr>
<td>Median exercise episodes/week (IQR)</td>
<td>3 (3)</td>
<td>3 (5)</td>
<td>ns</td>
<td>0.5 (5)</td>
</tr>
<tr>
<td>% drinking alcohol in last month</td>
<td>63%</td>
<td>56%</td>
<td>ns</td>
<td>50%</td>
</tr>
<tr>
<td>% eating low fat foods regularly</td>
<td>100%</td>
<td>96%</td>
<td>ns</td>
<td>96%</td>
</tr>
<tr>
<td>% eating low sugar items regularly</td>
<td>96%</td>
<td>77%</td>
<td>0.1</td>
<td>71%</td>
</tr>
</tbody>
</table>

*Mann Whitney U tests were used to compare two groups at entry to and exit from the study period.*

As shown in Table 4.6 Mann Whitney U tests were performed on all the variables between the two groups at the entry interview and at exit interview did not show any significant difference between the groups. Although the level of fruit and vegetable eating was beginning to reach significance \((p = 0.09)\) at the exit interview. Table 4.7 shows the comparison of the means of each separate group at entry to and exit from the study period. This time, Wilcoxon matched pairs did not show any significant changes in the frequency of behaviours over the study time. However the results from the control group showed that the decline in the frequency of breakfast eating from entry to exit is approaching a significant level. \((p = 0.08)\).
Table 4.7 Dietary and behavioural characteristics of participants compared within groups at entry and exit to a weight loss maintenance period of 6 months.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Control Baseline</th>
<th>Control Exit</th>
<th>Wilcoxon matched pairs</th>
<th>Intervention Baseline</th>
<th>Intervention Exit</th>
<th>Wilcoxon matched pairs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median fruit and vegetable intake</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Portion number)</td>
<td>4</td>
<td>4</td>
<td>ns</td>
<td>4</td>
<td>5</td>
<td>ns</td>
</tr>
<tr>
<td>% eating breakfast daily</td>
<td>100%</td>
<td>75%</td>
<td>0.083</td>
<td>93%</td>
<td>88%</td>
<td>ns</td>
</tr>
<tr>
<td>Median exercise episodes/ week</td>
<td>3</td>
<td>0.5</td>
<td>ns</td>
<td>3</td>
<td>3</td>
<td>ns</td>
</tr>
<tr>
<td>% drinking alcohol in last month</td>
<td>63%</td>
<td>50%</td>
<td>ns</td>
<td>56%</td>
<td>36%</td>
<td>ns</td>
</tr>
<tr>
<td>% eating low fat foods regularly</td>
<td>100%</td>
<td>96%</td>
<td>ns</td>
<td>96%</td>
<td>92%</td>
<td>ns</td>
</tr>
<tr>
<td>% eating low sugar items regularly</td>
<td>96%</td>
<td>71%</td>
<td>ns</td>
<td>77%</td>
<td>66%</td>
<td>ns</td>
</tr>
</tbody>
</table>

4.5.7. Relationship Between Behaviours and Weight Loss Maintenance
To assess the relationships between variables that may influence weight maintenance, such as the number of exercise episodes, the amount of fruit and vegetables eaten daily, and the frequency of self monitoring of weight, Pearson's correlation analysis was undertaken using the combined data from both groups. In Figures 4.7 – 4.9 the negative score on weight change reflects further weight loss in comparison to the amount of weight loss on entering the study period.
Figure 4.7 demonstrates a modest but significant correlation ($r = -0.352$) between the amount of fruit and vegetables eaten and the ability to keep weight at a maintenance level. Therefore, suggesting that the larger the quantity of fruit and vegetables eaten the more likely it was for the participant to have maintained their weight in a weight band or continued to lose weight.
Figure 4.8 Relationship between episodes of exercise at the end of the study period and weight change during that period

Figure 4.8 shows the same picture with an increase in the number of 15 minute exercise episodes taken per week improving the ability of participants to maintain weight loss. The effect size is larger than for fruit and vegetables (R=0.27) showing a medium effect. The significance of this is shown in Figure 4.8 where the Pearson correlation is significant to a level of <0.01.
Figure 4.9 demonstrates that there was no significant correlation between the frequencies of weight checking against the actual weight loss maintenance using Spearman’s Rank correlation. Each participant in the study was encouraged to weigh themselves weekly. However at the exit interview participants reported that they had: given up weighing regularly (noted on the figure 4.9 as 3); were weighing monthly (noted as 2); weighing weekly (noted as 1); or were weighing daily (noted as 0).
4.5.8. Weight Loss Maintenance in Intervention Group
A separate correlation was completed, using the intervention group only, to see if
the frequency of the email or login contact with the researcher affected the weight
loss maintenance. Although there was a trend towards greater email contact being
associated with greater weight loss this relationship was weak and non significant
($r = -0.18; p = 0.383$). This could be due to the small number (25) of participants in
this group.

4.5.9. Analysis of Diet Type
Each participant followed a diet to lose weight. This was one of three adaptations of
their intake: a low fat diet plan; a 1,500kcal diet; or a plan based on dietary targets to
modify the intake (generally a mix of low fat and sugar, high fibre and portion size
advice, appropriate to the participant’s lifestyle). Kruskal-Wallis test was conducted
on the diet type against the amount of percentage weight loss maintained. There
was no significant difference between the dietary programmes and ability to
maintain weight loss (Table 4.8).

| Table 4.8 Comparison of diet types and percentage weight loss maintained over a six month weight maintenance study period |
| --- | --- | --- | --- | --- |
| Diet Type | N | Mean % weight loss maintained | Std dev | 95% Confidence Lower | Significance |
| | | | | Upper | |
| Individualised Dietary Plan | 26 | 8.52 | ±4.55 | 6.67 | 10.36 |
| 1500 Kcals | 11 | 8.73 | ±5.23 | 5.20 | 12.24 |
| Low Fat | 12 | 10.33 | ±4.94 | 7.19 | 13.47 |
| Total | 49 | 9.01 | ±4.76 | 7.64 | 10.37 |
| | | | | | $P = 0.445$ |
4.5.10. Perceived Effort in Achieving Weight Maintenance

Both before and after weight maintenance, each participant completed a questionnaire designed to assess the concept of effort that individuals apply to various factors of weight maintenance. The scoring system was based on a Likert scale (1 – 8) with 1 reflecting least effort and 8 being the most amount of effort. Individuals rated themselves on various parameters for their concept of effort in: weight maintenance, keeping to a diet and undertaking exercise. They also scored their pleasure at achieving weight maintenance, eating a reduced calorie meal and undertaking exercise, on the same Likert scale of 1-8. The score for effort was then subtracted from the pleasure score, to provide an overall concept of how much effort an individual felt they were exerting to achieve weight maintenance on each factor. A negative score was seen as more effort being placed than a positive one, the range of score could therefore be -7 to +7.

Table 4.9 Perceived effort taken to maintain behaviours associated with weight loss maintenance over a six month period comparing intervention with control group.

<table>
<thead>
<tr>
<th></th>
<th>Control Group</th>
<th>Intervention Group</th>
<th>Mann Whitney U test</th>
<th>Control Group</th>
<th>Intervention Group</th>
<th>Mann Whitney U test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n= 28</td>
<td>n= 27</td>
<td></td>
<td>n =24</td>
<td>n = 25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pre study</td>
<td>Pre study</td>
<td></td>
<td>Post study</td>
<td>Post study</td>
<td></td>
</tr>
<tr>
<td>Median Effort to Control Diet (IQR)</td>
<td>-1 (2)</td>
<td>-1(2)</td>
<td>ns</td>
<td>-1 (1)</td>
<td>-1 (2)</td>
<td>ns</td>
</tr>
<tr>
<td>Median Effort to Undertake Activity (IQR)</td>
<td>-0.5 (3)</td>
<td>-1 (1)</td>
<td>ns</td>
<td>1 (3)</td>
<td>1 (2)</td>
<td>ns</td>
</tr>
<tr>
<td>Median Effort to Maintain Weight (IQR)</td>
<td>0 (2)</td>
<td>1 (3)</td>
<td>0.19</td>
<td>0 (2)</td>
<td>0 (2)</td>
<td>ns</td>
</tr>
</tbody>
</table>
Table 4.9 shows the mean results of each group before and after the study period. Mann Whitney tests conducted to compare the intervention and control group showed no significant difference between the groups. However the median values shown indicate that both groups have a greater level of perceived effort over the pleasure (denoted by the negative score) derived from controlling their diet rather than undertaking exercise or maintaining weight in general. To examine change in perceived effort over time for each group separately, Wilcoxon matched pairs tests were used.

Table 4.10 Change over time in perceived effort in the intervention and control groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Effort rating</th>
<th>Median value</th>
<th>IQR</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>Entry diet effort</td>
<td>1</td>
<td>2</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>Exit diet effort</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td>Entry exercise effort</td>
<td>1</td>
<td>1</td>
<td>0.028*</td>
</tr>
<tr>
<td></td>
<td>Exit exercise effort</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td>Entry maintenance effort</td>
<td>1</td>
<td>3</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>Exit maintenance effort</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>Entry diet effort</td>
<td>1</td>
<td>2</td>
<td>0.008**</td>
</tr>
<tr>
<td></td>
<td>Exit diet effort</td>
<td>-1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>Entry exercise effort</td>
<td>0.5</td>
<td>3</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>Exit exercise effort</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>Entry maintenance effort</td>
<td>0.0</td>
<td>2</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>Exit maintenance effort</td>
<td>0.0</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

*Significant level **Significant p < 0.01
For the control group (n= 24)

- effort to control diet there was a significant change (p <0.01) to a more positive score indicating their perceived effort in maintaining dietary change had significantly reduced during the course of the study effort to undertake activity was also approaching a significant level (p = 0.07)

- maintain weight there was no significant change in the control group.

For the intervention group

- there was no significant difference in effort to control diet or effort to maintain weight,

- there was a significant change in their effort to undertake activity (p = 0.028) indicating that, at the end of the study, they were finding it more pleasurable or were making less effort to undertake physical activity.

4.5.11. Reasons for failure to maintain weight

At the exit interview, all participants were asked what problems they had experienced during the 6 month study period. The results were scored as follows: if the individual failed on all targets with no specific reason, the score was 0; if they partially kept to targets, the score was 1; if they kept to all dietary and exercise plans, the score was 2; if their mood affected their ability to keep to targets and they were eating to emotional response, the score was 3; being physically ill and therefore unable to keep to targets, the score was 4. Figure 4.10 shows the results of target adherence against the amount of weight change over the study period.

The results of Spearman's correlation completed between the degrees of weight change over 6 months against adherence to the targets showed a significant correlation rho = 0.57; p = <0.001 (see figure 4.10).
Those who reported low mood had resorted to comfort eating as a result. This was scored as 3 and, from the graph; the weight of the group change is higher than the weight maintenance band (marked in red). Physical illness also pushes the weight loss maintenance above the weight band. Individuals who reported physical illness did not keep to their activity targets and, as such, support the results of the correlation between exercise and weight loss maintenance. Of note is that the two who did not keep to their dietary or exercise targets were in the control group.

![Graph showing relationship between adherence to dietary targets and weight change](image)

**Figure 4.10** Relationship between adherence to dietary targets at the end of the study period and weight change during that period

Not keeping to targets scored = 0; Keeping to only some targets = 1;
Keeping to all targets=2; Reporting low mood = 3; Physical illness = 4.
4.5.12. Summary of Quantitative Findings
The hypothesis that was originally tested was not proven, in that the intervention did not allow people to have significantly better success in maintaining weight loss. There is evidence that the intervention group were better at maintaining their weight loss to a clinically significant level.

However, this study has demonstrated that eating fruit and vegetables benefits weight loss maintenance as does exercise. The type of diet used to lose weight, and therefore forming the basis of dietary targets, and the frequency of personal email contact does not seem to influence weight loss maintenance. Physical illness and low mood are both linked to poor weight loss maintenance. In measurement of people's perceived effort over time, more frequent contact with a professional (intervention group) appears to have a benefit in supporting the ease of exercise which assists in achieving weight maintenance; whereas the control group, without professional support, have a decline in effort taken with dietary adherence.

4.6 Qualitative Results

4.6.1. Experience of Email on the Intervention Group
At the exit interview each participant in both the intervention and control groups, was interviewed about their experience of managing their weight over the last six months. From this, the themes of keeping to their dietary and exercise plans were assessed as mentioned in the previous section (3.15). Of interest, however, was the response by the intervention group of having used email for contact and receiving ‘Tip of the Week’ over the last 6 months. All speech is written as italics.

4.6.2. Process of Analysis
The data were analysed using methodology based on a practical thematic analysis framework (Aronson, 1994; Miles and Huberman, 1994). As part of the exit
interview, participants were asked to feed back their experiences of using email in the management of their weight loss maintenance using their own words.

The comments made were written verbatim and transcribed later by the researcher. These comments were read and re-read by the researcher so that the comments became familiar and the researcher could begin to identify with the experiences and feelings described by the participants. Each participant's comments were then analysed for emerging themes, which were occurring frequently. These themes were placed as headings for a category and the transcript of each participant assigned to relevant categories. If no appropriate category existed, then the response was used to form a new category.

The following themes were identified and these will be discussed in turn: “Saved Time, Feeling Special, Focus, Spooky, Disclosure and Loved the Tip, Learned from the Tip of the week and Good old Computers!” and “Comments about the researcher.”

4.6.3. ‘Saved Time’

Seventeen of the intervention group (68%) reported that they liked the use of email. There was a general consensus that email saved time, with one participant noting that it saved the stress of parking! “Saves me coming to the hospital and trying to park!” (Male, aged 55 years); “An email takes hardly anytime to respond to” (Female aged 64); another female aged 58 said “I appreciate the time it takes you to do the Tip of the Week”. Comments about time were largely from the older members of the group, possibly reflecting the importance of not wasting time.

Emails were found to be “useful” (female aged 55); “good” (female aged 36); “jog memory” (female aged 37); “jolt to memory” (male aged 18); “made me laugh” (female, aged 45); “loved them” (female aged 70).
4.6.4. ‘Feeling Special’

Their experience was positive, reporting that emails made them feel “special”; “made them laugh”; “felt important when I had an email from you” (female, aged 18). Emails were reported as “Great”, “Loved them”. There was also an influence of response from the researcher for example “Helps to know you are watching” (female, aged 33); “nice to be able to correspond” (female aged 35); “like the praise for being in the weight band” (female, aged 64). There were many comments supporting the personal nature of the email contact and as such many individuals discussed ‘personal’ information via the email contact; this has been picked up under the heading of “disclosure”.

4.6.5. ‘Created Focus’

Emails created “Focus”. Over half of the intervention group made comment about the ‘personal nature’ of the email contact. In the case of the Tip of the Week, participants reported that “I can hear you saying them” (female, aged39); “I like knowing you are there” (mentioned by three participants all female, aged 26, 43, 64); “I talk to the screen as if you were there” (female, aged 48). There was also the benefit of it acting as a reminder – “a jog to the memory” or “a jolt to the memory”. “I would think “I have to get myself weighed” and you would send an email!” (female, aged 26), the weekly frequency of the email would help to remind people of what they were trying to achieve, as put in words by a male aged 18, “New email from you made me focus especially as it came every week”. A female aged 64 described the contact as a “Conscience”.

4.6.6. ‘Felt Spooky’

There was an influence on participants that the remote contact was ‘spooky’ as the contact came unsolicited – “it was there” (female, aged 43). Other comments were it felt “like Big Brother” (female, aged 64). “I think ‘is she watching me?’” (female, aged 39). Therefore the email contact felt ‘familiar’ and that the researcher was present.
This was described as “I find myself talking to the screen” (female, aged 48); “I can hear you saying them!” (female, aged 39).

“I know you are watching”. This response picks up on the Big Brother feeling; that the researcher was uncannily aware of what the individual was doing or struggling with. Comments such as “I would think that – she’ll email and ask for my weight soon – and next time you would be there” (female aged 26). “It helps to know you are watching! Think to myself. Oh! I must weigh self” (female aged 33), reflects the feeling that participants found that they anticipated the contact from the researcher, there was also some degree of responsibility reflected in the attitude of individuals to the contact

4.6.7. ‘Loved the Tips’
Tip of the week gained a very positive result. Twenty of the 25 in the intervention group found the emails to be positive and beneficial. Many commented that the Tips were “funny- hilarious”; “topical”; “I know you are there”; “a conscience reminder”. The Tip was found to be “useful”. However many reported that they found the Tip to be “what I knew”; “nothing new”; “disappointing I was hoping for a miracle tip!”

Although many enjoyed the topical nature of the Tip of the Week, others wanted more recipes or were unhappy that the topic did not reflect their needs e.g. “talking about alcohol when I do not drink”. This reflects the ‘personal’ nature of the email, as if it was being sent to them alone. They enjoyed the way the email ‘jogged memories’, ‘was a reminder’, ‘felt like you were watching’.

Of note was that the entire intervention group asked for ‘Tip of the week’ to continue although the project was completed.

The breakdown of themes from this became:
4.6.7.1. ‘Topical’
Tips such as; “Some good hints about managing cravings etc and all those calorie values at Xmas” (female, aged 39); “tips about mince pies and sausage rolls – I did not know this” (female, aged 70); “Mothers Day talking about chocolate, hot weather drinking water.” (female aged 33), were perceived as beneficial, although some did find them ‘funny’ as shown by the last quote, where she remarked that she found topical tips “hilarious”.

4.6.7.2. “Funny - Hilarious”
“Tip of the week is funny” (female, aged 64); “Emails did make me laugh” (Female, aged 58); “Liked the Tips they are funny!” (female, aged 55); “They make me laugh” (female aged 64); “They make me laugh at times” (female, aged 45). As can be seen from all the comments here it was the older women who found these to be ‘funny’ – a reflection of the attitude to the nature of the contact.

4.6.7.3. “Reminder” (Memory jogger)
Email “jogged memories” (male, aged 18 and Female aged 36), “was a reminder” (Females aged 18, 48 and 55), “I know you are there” (female aged 43); “a conscience reminder” (female aged 64). One lady reflected on the positive nature of the contact “I appreciate them and the contact it gives me” (female aged 59). Because the Email Tips arrived weekly, they helped to create a motivational response, a means by which the recipient could focus on weight issues.

4.6.7.4. “Nothing New”
For some the Tip of the week was “what I knew” (female aged 44); “nothing new” (female aged 71) “it is all common sense!” (female aged 36). Some described their frustration in wanting a “miracle tip” (females aged 44, 64, 37) or something that they did not know, implying it would make a difference to have new information.
4.6.7.5. “Disappointing”
Some found the Tips disappointing, for example: “Tip of the week is nothing new – I know it all. Its doing it isn’t it?” (female aged 43) and “I know the things you tell us but I like to be reminded. I don’t know all the things though” (female aged 48). This last one shows the need by individuals to produce a good result for the researcher when being critical.

“Sometimes email is not helpful. Tip about alcohol not relevant – I don’t drink” (Female aged 39)

The tips about alcohol received more criticism as they were mentioned specifically by two participants “Alcohol ones are no good for me” (female aged 38). One particular issue for one female was not feeling heard “Your emails were ok but I felt I could not make you understand what was happening to me and how awful I felt” (female aged 58)

4.6.7.6. “Hated the Tips” (Negative comments about the tips)
There were few negative comments about Tip of the Week. The main issue centred on the fact that most; “knew the tip” and that it was “nothing new”.

“Tip of the week I know it anyway” (female aged 37); “Sometimes email is not helpful” (female aged 39); “At end of the day it is only an email” (female. aged 33), is a reflection of the frustration with the impersonal nature of electronic contact.

4.6.8. Disclosure
Five of the group emailed in addition to their monthly email contact. This was to discuss issues that were pertinent for them: illness, weight gain, dietary advice. On several email contacts, there was also additional information provided; often of a personal nature. This revealed another theme in the transcripts, that of disclosure and individuals revealing emotional responses.
This heading was therefore broken down into:

4.6.8.1. "To Lie or Not to Lie"
Lying was mentioned by one female participant (aged 33) who said “At end of the day it is only an email. In the back of my mind – she will email me – I could lie! Imagine I was lying on an email – what’s the point? I did not lie though”. This comment shows a reflection of the frustration with weight management and also the loyalty placed with the researcher; a reflection of “wanting to do well for you” (female aged 58).

4.6.8.2. “Guilty”
“I feel guilty; I know I am not doing well enough for you” (female, aged 58). This comment reflects the feeling that participants had that they felt loyal and an element that they were frustrated they could not have contact “When I felt down I felt able to contact you, but it was just email contact I really wanted to see you” (female, aged 42). “After 3 months and the weight was going up I felt guilty and did not respond to you” (female aged 55).

4.6.8.3. “Personal issues”
For three individuals, the email system provided a means by which they could talk about other issues that were bothering them. These were all comments made on email as a response to the monthly request for their weight. One female participant (aged 36) described her concern at seeing the doctor for a cervical smear. A male aged 18 revealed the issues he had with his mother (she was also obese) and he reported that she was not buying the right sorts of foods for him. These comments would never have been made by those individuals in a face to face consultation. One female reported several issues with her female partner and the effect the partner’s mental health status was having on both of them.
Others made negative comments about themselves on email “I am lazy” (female, aged 44). Several of the group also mentioned issues with their physical well being – struggling to get out for a walk, “My hernia is bigger and my self image is dreadful. I feel very down” (female aged 58) or emotional issues “I did get stressed when my hubby was ill” (female aged 45) or mood issues, describing feeling depressed.

Alternatively some also reported the good feeling about their weight loss and their achievement “Proud of my achievement as I thought I would lapse! I used to wear size 24 – 26, now I am wearing 18 -20” (female aged 33)

4.6.9. Learned from the Tip of the Week

4.6.9.1. How to Manage Cravings (Skills gained) and Calorific Values (Knowledge gains)
Seven of the group felt that they had learnt from the Tips. “The hints given helped me to manage cravings”; they described feeling “clued up on weight control”; “all those calorie values were so useful”; “I did not know about sausage rolls and mince pies!” The overwhelming influence was that the messages kept reminding them, kept them weighing and at the end of the 6 months this made them ‘proud’.

4.6.9.2. Information Sharing (Knowledge and understanding) & Keeping It for Reference (self-reminders)
Sharing the information obtained from the Tips was mentioned by five people. “I learned so much – I talked about them to my colleagues”. Another female participant forwarded the study emails to her friends. Another discussed how she had gone on holiday so her daughter accessed her emails and then used a SMS text message to transfer the Tip of the Week to her on holiday. Two of the male participants stored the Tip of the Week in separate files on the computer to keep for reference. At the exit interview, 4 people were able to quote (unprompted) the most recent Tip of the Week.
4.6.10. Good Old Computers!

- Concerns voiced were:
  - Crash
  - Security scare (virus warning)
  - Access to home computer

As with all electronic communication there are set-backs and the functioning of people's computers was an issue. The computer crashed, broke down or people moved house (2) and so service was interrupted. This was the reason why the entire group did not respond to every monthly email asking for their weight. One male participant was very worried about email security and discussed it at length in his exit interview (male aged 55). He was concerned about a virus transfer from the larger NHS network to his computer. However, he still felt that email was an excellent means of communication and wanted the Tip of the Week to continue. An older lady in the group also sent on any virus warning she received to the researcher. Therefore, security is an issue more for the older person.

Of note was the specific nature of addressing the emails, which was emphasised by the IT ‘safe use’ (Appendix E) declaration form, was not adhered to by the email recipients. There was a feeling that the release of ‘personal’ information over the email system was not the issue, but the overall integrity of the computer system was. As shown by the nature of the text included in the emails, confidentiality was not an issue for participants.

There were also concerns for those who were on a dial-up connection to the internet. At an exit interview, one person insisted it would be easier once they were on a broad-band connection. Access to the home computer was also an issue when the individual was competing against children and partners. One female participant said, “Hubby is doing OU! I hardly get a look at the keyboard!” (female aged 38).
Others reported that they received the message to contact with a weight but then could not respond straight away due to computer issues and so “missed replying to you”.

4.6.11. Comments About the Researcher
One individual commented on the typographical errors in some of the Tips as she had dyslexia and hence reading the Tips and making sense was an issue for her. There was also a reflection of the relationship between recipients of the emails and the researcher “When I felt down I felt able to contact you” (female aged 42). These comments, in addition to the issues regarding guilt, lying and personal issues, illustrate the positive relationship between the researcher and the individual. This is an issue that is discussed in relation to behaviour change in chapter 5.

4.7 Overall Experience of Weight Maintenance

4.7.1. Access to Scales
Several individuals reported that gaining access to scales they could trust was an issue. Some used their GP scales, others at a local shop. However, the latter introduced a cost for using the scales and, for some, this was felt to be prohibitive, (Intervention, female aged 39). Also it was felt that if the weight was creeping up, going to the shop put individuals off (control female aged 32). Others purchased new scales, getting a set of digital scales.

4.7.2. Not Having Control
“Having no access to you when my weight was creeping up was scary for me; I was unsure how I could manage it” (control group male aged; 45). This was an issue for those who did not have email contact.

4.7.3. “I Thought I Could lose More Weight”
Two males and three females in the control group were very disappointed that they could not lose more weight over the 6 months. One female (intervention group, aged
33) reported that “I want to be 10 stones when my body is happy to settle for 12 stones”. This shows the frustration in achieving clinically effective weight loss, but not always aesthetically pleasing weight loss.

4.7.4. Stopped Weighing
For both groups there were individuals who had stopped weighing (4 in control and 2 in intervention) once they were over the top of the weight band and could not re-focus to reduce the weight into the band again. One female in the intervention group reported her weight had gone out of the weight band and she had “given herself a good talking to!” (female aged: 36)

4.7.5. Family Life Gets in the Way
Of the whole group eleven (20%) commented that family issues were prohibitive in one way or another. Some had issues about family members buying food and/or producing menus that were not suitable. One male participant found frequent trips to his daughters caused issues around meal times and his need to take activity, (intervention group aged 64). Another had issues with her brother, who was keen to ‘treat her’ to weekend meals out (female, control group aged 38).

4.8. Conclusion
The qualitative findings of the study reveal a valuable source of information concerning the attitude of individuals to this form of contact and the establishment of a strong relationship between the researcher and the individual which must be taken into account when considering the factors that enable individuals to maintain their weight loss.

The qualitative findings add support to the quantitative findings in that a ‘fuller’ picture is obtained. The experience of the intervention appears positive, with the participants finding the experience positive and enjoyable. The intervention itself has
some benefit in supporting behaviour change and reducing the rate of weight regain over a six month period.
Chapter 5: Discussion

5.1 History of the Study
This study came about with the increasing demand for treatment of adults with obesity within a dietetic department. The increase in the rate of obesity caused the World Health Organisation to report in 2004 that obesity had reached global epidemic proportions. Dietitians remain one of the few professions within the National Health Service to treat obesity. To meet the rising number of referrals, a weight loss clinic was established in an acute NHS trust. Previous outpatient clinic systems had provided obesity treatment in amongst dietary treatment for other conditions. Patients might not have seen the same dietitian twice and results were poor, with average weight loss being low (1.2kg) and the attrition rate being high (14.6% for the initial appointments rising to 27.3% for follow up appointments). The new weight loss clinic established a better system for patients, where they engaged successfully with the dietitian by seeing the same practitioner at every visit. Attrition rates improved (11.6% at initial appointment falling to 7.8% for follow up appointments) and the average time to achieve a meaningful weight loss of 6% initial body weight was just five visits (approximately eight months). However, many researchers have commented that weight loss is only part of the obesity management process (Hill et al., 2005). Maintaining the weight loss is crucial to achieving the beneficial effects of having lost weight.

Towards the end of consistent weight loss, a process was established to teach individuals how to monitor and control their weight. However patients were reluctant to be discharged from the weight loss clinic, with concerns that their new found weight management skills would be lost. Therefore, continued professional support was needed but there was an issue about how cost effective this could be. Also, with increasing demands on dietetic time, due to the continued expansion of referral
numbers, a system was required by which successful weight loss patients could be given professional support with minimal contact time with the dietitian, effectively discharging them from the weight loss clinic, freeing space for further referrals to be seen and improving caseload management.

The use of the internet in the management of weight loss has received much scrutiny in the past ten years. However, within the UK there have been no studies investigating the possible benefit of contact with a dietitian through email to maintain meaningful weight loss. This study sought to investigate whether this style of support, providing weekly contact and a personal contact system every month, would assist those patients leaving the weight loss clinic, with a weight loss ≥5% of their initial body weight, in maintaining that weight.

The hypothesis was that in patients who were obese and have achieved a weight loss of >5% of their initial body weight, there will be a significant difference in weight loss maintenance in those who, following the weight loss period, have maintained contact with a dietitian through email compared to those who have no contact.

From this hypothesis, three specific objectives were established:

- To compare over a six month period, in individuals who have achieved similar weight loss, whether maintenance of weight loss differs in individuals who have access to dietetic support via email compared to those who do not.
- To identify by means of a questionnaire which factors either encourage or inhibit self-management of weight maintenance (consumption of breakfast, amount of fruit and vegetables eaten, eating a low fat diet, frequency of self monitoring of body weight, undertaking regular exercise) in participants who have successfully completed an NHS weight loss programme.
- To conduct interviews to assess the personal experience of using a remote communication method (email) between participant and professional.
5.2 Testing the Hypothesis
The study participants had been shown how to manage their weight using a weight band of ±2kg around their end weight after weight loss intervention. The aim was to discover if this tight control, as suggested by StJeor et al., (1995), would facilitate individuals to maintain their overall weight loss achievement.

Section 2.3.4., showed the many different classifications of what constitutes weight maintenance.

Stevens et al., (2006) recommended that weight maintenance be defined as a weight change of ±3% of a designated body weight. Whereas prior to this, Ayyad and Anderson (2000) reviewed a number of extended studies (3 -14 years; median 5 years) and they defined success in weight maintenance using 2 criteria:

- maintenance of the entire weight loss
- maintenance of >9 – 11kg (generally representing 10%) of the initial weight loss.

Maintenance of the entire loss is challenging, as body weight will vary with diurnal variation (as much as 2kg), fluid balance (±5%) daily, menstrual cycle (as much as 1.2%). Therefore vigilance in managing weight at an exact level is seen to be too challenging and is the issue with many studies (Stevens et al., 2006). Maintenance of 10% weight loss is a popular marker of successful weight loss maintenance. Wing and Hill (2001) also support this threshold. However Stevens et al., (2006) suggest that a 5% weight loss is seen to be clinically relevant as well as being achievable and beneficial for many (Goldstein, 1992). Therefore Stevens is keen to put forward the definition of maintenance being seen as achieving this level of weight loss (5%) and a minimal regain to ±3%. As described in section 4.5.3. This study has set the same criteria as Stevens et al., (2006), in that maintenance of 5% is desirable to
ensure clinically beneficial results for most participants and a minimal level of 3% for those that enter the study period at 5%.

In the design of this study, participants needed to be shown a way in which they could control their weight to ensure that the ultimate aim was to achieve a minimal weight regain to 3% - which would apply if they had lost a minimal amount of 5%. As such the StJeor et al., (1995) weight band provided an ideal tool for weight maintenance management. The weight band places the end weight on leaving the weight loss clinic, in the mid-range of ±2kg. By keeping their weight in this range weight loss should be maintained within the desirable parameters as discussed above.

The results from this study, show that although more participants were within the weight band from the intervention group (15) in comparison to the control group (12) this difference was not significant. Therefore, on this criterion the hypothesis was not proven. However of interest is the significance achieved when the percentage weight loss was tested between each group.

The results show that both groups had a mean percentage weight loss of the initial body weight of ≥10% at entry into the study. Keeping this percentage weight loss is of clinical significance and benefit for both groups. At six months, the control group had a significantly lower percentage weight loss (7.3%) than the intervention group (10.1%) (p<0.05). However both were in excess of 5% and therefore would be deemed to be successful in weight loss maintenance using the study's criteria. However, if the criteria set by Wing and Hill (2001) & Ayyad and Anderson (2000) were used, then the intervention group would be seen to be more effective in that they had maintained a 10% level. As both groups had declined slightly in the level of percentage weight loss, it could be assumed that a further decline in levels may
occur past 6 months. It is therefore desirable to preserve the higher level at this stage.

Wilcoxon Matched Pairs test of the amount of initial weight loss against the amount of weight loss maintained over time showed a significant reduction in the control group (p<0.01) but no statistical significance in the intervention group. This reflects the rate of weight regain in the control group to be greater than that in the intervention group and suggests that within 12 months there would be a greater difference between the two groups.

Although not a statistically significant difference, the weight loss maintained using the weight band definition; more of the control group (11) were above the weight band in comparison to the intervention group (6). However, closer consideration of the spread of weight levels in both groups shows an important clinical change, which is reflected in the percentage weight loss maintained at six months, which achieved statistical significance. This was due to more of the patients in the intervention group having continued to lose weight (4) during the study period, against only one of the control group achieving this result. This suggests a limitation with the hypothesis, in that it does not consider further weight loss on entry to the study.

A study by Harvey-Berino et al., (2002) randomly assigned patients to one of three conditions: on-site therapist programme, Internet therapist led programme or control condition; in that study, patients lost 6.5 kg initially but all groups continued to lose weight during the maintenance phase with an end result that the average weight loss achieved reached 8kg and there was no significant difference between the three groups at the end of the maintenance phase. On this evidence it could be suggested that in the present study both groups should have been expected to
continue to lose weight to the same degree but this was not the case and therefore indicates a difference in the effect of the intervention.

Although weight maintenance was the main aim of this study, an important clinical achievement such as further weight loss is a factor that must be considered in terms of success. In both groups, at baseline, the average percentage weight loss was ≥10% whereas, for some individuals, their weight loss was as low as ≥5%. As the initial weight loss of some participants in both groups is only marginally above the 5% desirable goal (between 5 – 7kg) and it is desirable that all the weight lost is maintained. To achieve the definition suggested by Stevens et al., (2006) of maintaining 3%, any increase in weight within the first six months potentially threatens the achievement of this standard. The intervention group had more participants either in the weight band or below it (76%) than the control group (54%). This again did not reach significant levels but the results are encouraging in that individuals were reaching and maintaining more clinically effective levels of weight loss.

It is of interest to discuss whether the study can therefore be viewed as successful when considering that the intervention group had more individuals who were in the weight band or had continued to lose weight. Although not reaching significant levels, consideration of the benefit gained by maintaining weight loss to a level of 10% must be seen as a positive clinical outcome. As discussed earlier, obese individuals who achieve weight loss where the end weight still places them in the obese category view themselves negatively (Foster et al., 1997). Weight control behaviour is typically motivated by a desire to reach a positive goal, characterised by improvements in appearance and physical comfort (Foster et al., 1997) therefore individuals who have not achieved this desirable goal struggle to be satisfied and therefore fail to maintain the behaviours required to preserve that weight. An early
descriptive analysis of people who had been successful in weight loss maintenance (Colvin and Olsen, 1983) described those who had reached their goal weight as being successful, in that they were in the 'ideal' weight for age and height and were 'delighted' with their present weight. This was not the case for the participants in this study. Therefore, in the preparation of patients for weight loss maintenance, it is crucial that participants understand further weight loss is a positive outcome but it is important to continue to establish weight maintenance around any new weight achieved. It is also a key factor for the practitioner to also be able to recognise entry into a maintenance phase.

The American National Institute of Health Conference (USA) on Voluntary Methods for Weight Loss concluded that short term programmes, achieving <10% body weight loss, will have as many as one third regaining that weight at the end of the year (NIH Technology Assessment Panel, 1993). Within six months, this study had 45% of the control group going above their weight band, in a weight regaining phase, compared to 24% of the intervention group in that position. This suggests that in this study both groups are showing more beneficial results than those reported from America in 1993, which could be explained by the fact that this study both groups entered maintenance having achieved a mean weight loss of ≥10%.

5.3 Study Effectiveness
Wilding (2007) stated that, for some patients, preventing weight gain may be a reasonable aim of treatment. For example, a patient may lose 15% of their initial body weight and then regain that weight loss within one year so the benefit to their health status is nil, however during the process there has been benefit to the individual from the weight loss and it has also prevented a period of further weight gain during the time that weight was being lost and during the initial period of weight gain. A study by Hill et al., (2003) estimated that, in adults aged 20 – 40 years old,
the average weight gain over one year is 1kg. As a result, whilst someone is actively engaged in losing weight and then trying to maintain that weight loss, the aggregate increase in weight is not achieved. In this study, of the 49 participants who had lost a clinically significant amount of weight, 46 (94%) had managed to maintain that loss in the first six months following active weight loss, to a level of ≥3% initial weight lost (viewed by Stevens et al.,(2008) as being a clinically sound measure). This is considered to be effective management for long term benefit as rapid weight regain is likely in the first 12 months post intervention (Svetkey et al., 2008). Consequently, there was a successful outcome in this study for the whole group, independent of the intervention.

In considering the benefit of the intervention, there is no statistical significance across all parameters with regard to keeping weight within the weight maintenance band. Nevertheless, the difference in percentage weight loss achieved at the end of six months does show that the intervention is more effective in maintaining and managing further weight loss than having no intervention at all. In addition, the statistical significance of the rate of weight regain over the study period in the control group indicates that the intervention is establishing tighter weight control than in the control group and that the difference between the two groups at twelve months may prove significant, if we assume the trends of percentage weight loss and weight regain seen in this study continues post 6 months. Based on the Svetkey et al., (2008) results it is suggested that this intervention using email could provide more efficient management of weight maintenance than no intervention at all and that a study looking at one year results can assess whether the intervention effect is transient or sustainable in comparison to control groups.
5.4 Cost Effectiveness

An Australian study (Pritchard et al., 2005) looked at the cost effectiveness of nutritional counselling in general practice to deliver weight loss. They report that the cost / kg lost would be £3.09 (based on a 2005 exchange rate) for dietetic led counselling which was less than the £4.13 quoted as a cost for the General Practitioner (NICE, 2006).

An analysis of the cost of weight reduction delivered through the Weight Loss Clinic was evaluated, based on an average weight loss of 4.43kg over a period that included six face to face sessions (a total contact time of 105 minutes) equating to 23 minutes/ kg. Studies from McQueen et al., (1999) and Frost et al., (2002) showed losses of 1kg taking 53 minutes and 43 minutes of dietetic time respectively. Using the results from the WLC using the cost of a band 6 dietitian (maximum increment) in the NHS (including administration costs at 23%), the cost of 1kg of weight loss in this specific weight loss clinic in the UK was £7.59 in 2008. In comparison to the rates of McQueen et al., (1999) where using 2006 rates the cost was £17.70/kg and Frost et al., (2002) £14.36/kg. A study by Sherwood et al., (2006) reported the cost of usual care for weight loss in the USA as $72 per kg (£37); which is much more than the Australian costs. Based on these figures, it would appear that the initial treatment through the Weight Loss Clinic is a more costly intervention than the Australian study however cheaper than earlier UK dietetic estimations and, if the weight is maintained, then the initial cost could be seen to be more worthwhile.

The study by Sherwood et al., (2006) used telephone counselling for weight loss and the cost was $132 / kg lost which is approximately £67 at 2008 rates. To send the weekly 'Tip of the Week' and a monthly personal email to each participant took 865 minutes over the six months of the study and, using the costs for a band 6 dietitian in the NHS, this would equate to £285.45 for the total management of 25
people over 6 months or £11.42 / patient. This appears to be a reasonable expenditure as it is equal to the cost of two follow up face to face consultations. An important consideration here is that weekly ‘Tip’ would take the same cost independent of the number of individuals that it is issued to and clearly the overwhelming advantage of the internet in comparison to telephone counselling and other means of support. The costs are also substantially lower than those reported for a group of dieters accessing a UK website for weight control (McConnon et al., 2007) which stated costs at £992.40 (£771/ participant in the internet group), where the cost of the establishment and maintenance of the web site was seen as prohibitive.

5.5 Long Term Support
There is some evidence that weight regain is delayed by longer treatment but there is not sufficient evidence about what happens when treatment eventually finishes. One of the few reports of successful weight loss with long term support comes from a study of group support (Latner et al., 2000). They reported a good outcome in those that continued to attend the group and have professional support; achieving 19% weight loss at one year which was maintained in full at two years. Continued monthly contact with a dietitian for six months, as in the Weight Loss Clinic, would cost £29.70. However, in the Latner study only 32% attended for three years and this reduced to 22% at five years. Within the UK, the cost of maintaining someone in treatment or supervision makes this type of intervention prohibitive. The email service offered through this study costs an estimated £11.42 per patient and of importance is that only two of a group of 27 (7%) failed to maintain contact, reflecting a low attrition rate and suggesting that individuals found the contact accessible and tolerable.
5.6 Limitations

This study had several limitations. When dealing with a population from a treatment group, the degree of weight loss achieved by each participant was unique to them and accomplished over a different period of time in each case. Perri et al., (1989) suggested that an extended treatment programme, where individuals had been in treatment for 40 weeks, improved long-term results compared to those who had treatment for 20 weeks only. This study took individuals who had reached a point where the velocity of their weight loss had diminished and as such whereas, most individuals had lost weight over a eight month period, the time elapsed for some individuals was as high as 24 months (2) or as low as four months (2). Hence it could be suggested that the individuals who had been in the process of weight loss for longer would have achieved weight maintenance more effectively than those who had been in treatment for less than six months. This also may account for those participants who had continued to lose weight over the study period. This reflects the cost pressures on NHS dietetic clinics where throughput is required to assist in caseload and demand management. This is an important observation when considering clinical application.

All participants had used one of three diet types for losing their weight; a 1500 kilocalorie plan, a low fat plan or dietary targets specific to an individual's dietary intake. A recent study by Wing et al., (2006) showed that a group of successful dieters, who had lost weight through different dietary measures, were successful at weight loss maintenance when provided with regular support. This supports the theory that the method of weight loss is not relevant and agrees with Dansinger et al., (2007), who state that there was no difference between diets that limited fat or energy intake but agreed that weight loss was statistically significantly greater with combined diet and exercise. Thus, although each individual observed a unique diet
and exercise plan, it is the adherence to these targets that achieves the weight loss maintenance and this was shown in Figure 4.11 which showed a significant correlation \((p<0.001)\) between adherence to maintenance targets and weight management. A statistical analysis using the Kruskal-Wallis test between the diet types used for weight loss against the percentage weight loss maintained showed no significant difference between diets, which is in agreement with the results of Dansinger et al., (2007) and Wing et al., (2006). However of note is that the low fat diet plans maintained weight loss at 10%, which although not significantly different to the other two diet types (10.3% versus 8.5% and 8.7%), does support the views of Tuobro and Astrap, (1997) in that low fat diets produce greater weight loss maintenance. It must be considered that the total number of participants recruited into this study was to detect a difference between two groups and not three.

5.7 Methods of Weight Maintenance

From their observational study in 1983, Colvin and Olsen suggested that people who were successful in weight maintenance adopted certain behaviours, including better nutrition, increased exercise and regular self monitoring of weight. Less is eaten between meals; less fat, less refined sugar and less red meat are included in the diet. Some twenty years later, data from the National Weight Control Registry (NWCR) in the United States support those behaviours for good weight loss maintenance. Wing and Hill (2001), Wyatt et al., (2002) and Wing and Phelan (2005) reported on the factors that have helped NWCR individuals maintain their weight loss, including: decreased intake of fat and consequently energy; increased intake of dietary complex carbohydrates; improved physical activity; regular self monitoring of weight; eating breakfast; and a consistent eating pattern are all part of a successful weight loss maintenance strategy. The results from the study, concerning weight control factors from dietary and exercise plans, will be considered in turn.
5.7.1. Decreased Intake of Fat
Tuobro and Astrap (1997) showed that a low fat diet was better for maintaining weight loss. In this study, all but one of the participants was regularly using low fat dietary products at entry into the study. However, on exit this had increased to three. Reasons given for not maintaining this behaviour during the study period included finances being restricted or purely weight management being a struggle.

5.7.2. Increased Intake of Fruit and Vegetables
At the start of the study, the participants in both groups failed to eat the national guideline of five portions of fruit and vegetables per day. There was a change in average consumption levels at exit from the maintenance study, and this is worthy of note. The participants in the intervention group managed to maintain their level of consumption at 4.6 portions per day, whereas the control group dropped their daily consumption from 4.2 to 3.8 portions over the six months, although this did not prove statistically significant. However, the Mann Whitney u test completed on the data from the two groups at exit, showed a level that was approaching significance (p = 0.09). Similarly, a small effect size (p=0.07) was seen between the level of weight maintained against the amount of fruits and vegetables consumed, with those in the intervention group consuming over five portions per day more likely to be at weight maintenance or losing weight in comparison to those eating fewer fruits and vegetables. This supports the reality that diets higher in fruits and vegetables are generally lower in energy and is another important factor for dietetic weight maintenance counselling. Schick et al., (1998) reports that individuals successful in weight loss maintenance in the NWCR include a large number of fruits and vegetables and low fat foods in their diet; this is supported by the results from this study.
5.7.3. Improved Physical Activity

Kayman et al., (1990) showed that exercise is essential for weight loss maintenance and this is supported by the observations from the NWCR. In this study, exercise activity was measured in 15 minute periods by the participants. On entry into the study, all were completing fewer than 4 episodes of 15 minute exercise sessions a week. The assessment of this activity was purely subjective by the participants and as such cannot be accepted as uniform across the two groups; nonetheless both groups are equally as likely to under or over report their exercise level. However, the control group reported fewer activity sessions at exit from the study than those in the intervention group, who maintained their level of activity at more than three sessions of fifteen minutes of exercise per week. These results are informative and it should be noted that this was supported by the correlation, with a medium effect of $r=0.27$, between weight loss maintained and the frequency of exercise episodes.

The researcher provided little directed information with regard to exercise (as dietitians cannot be prescriptive regarding activity duration and style) and encouraged participants to devise their own exercise plans based on their current level of activity. To this end, most of the exercise plans were based on walking, cycling, incidental movement or swimming rather than gym use, running, etc. This information is beneficial when considering dietetic preparation for weight loss maintenance. Hill et al., (2005) reports that people fail at weight loss maintenance because they attempt to fill the energy gap of 320kcal /day (assuming 18kg (40lb) weight loss) by food restriction rather than increasing physical activity, which becomes increasingly hard to achieve. They report that physical activity is the key to weight loss maintenance, as there are strong biological and environmental factors that oppose food restriction, whereas there is no biological opposition to physical activity.
The indication from this study is that exercise episodes are important in assisting weight loss maintenance and that even minimal bursts of activity appear beneficial. Jakicic et al., (1999) reported that patients who exercised in episodes of 10 minute bouts tended to exercise more frequently and had greater weight loss, which may support change in behaviour to encourage increased activity.

5.7.4. Regular Self Monitoring of Body Weight
Baker and Kirschenbaum, (1993) reported that consistent self monitoring is positively related to weight loss as it allows individuals to detect weight regain in the early stages and initiate change to reverse the trend and avoid major relapse. Phelan et al., (2003) studied the weight control patterns of individuals in the NWCR, and reported that few individuals recover from a 1 – 2kg lapse in weight maintenance that is increasing weight by 2kg above their normal weight, indicating that weight control appears to be in a tight band. The results of Phelan and co-workers are supported by this study both in the quantitative and qualitative results; as it appears that those who had gained weight above the 2kg level and taken themselves above the weight band struggled to regain control. This is an important factor for dietetic management. However, a correlation between the frequencies of weight checking did not reveal a significant level compared to weight control.

5.7.5. Breakfast Eating
There was a drop in the number of participants taking breakfast daily on exit from the study. The entire control group regularly took breakfast before the maintenance period, whereas only 75% (18) of them were eating the meal every day on exit. This decline in breakfast eating was approaching a significant level in the Wilcoxon matched pairs comparison (p=0.08), which was not seen in the intervention group. Wyatt et al., (2002) reported that breakfast consumption was a characteristic common to successful weight maintainers from the NWCR. They report that there
was no difference in energy intake between those eating breakfast and those not, but there was a link between more physical activity and breakfast eating. Therefore the need to stress the importance of maintaining breakfast eating should be considered in preparing individuals for weight loss maintenance.

5.7.6. Other Factors; Low Sugar and Alcohol Consumption
If these are taken as a measure of dietary restraint, both groups show a drop in the level of adherence from entry into the study. For both levels of low sugar items eaten and regularity of alcohol consumption, over 30% of both of the groups increased the amount of sugar and alcohol consumed. Wing and Phelan (2005) reported that a decrease in dietary restraint was a predictor of poor weight maintenance in the NWCR.

5.7.7. Overall Behaviours
Results from the NWCR and other studies have listed the factors that are influential in the management of weight loss maintenance (Wing and Hill, 2001; Wing and Phelan, 2005; Wyatt et al., 2002; Anderson et al., 1999; Colvin and Olsen, 1983). This current study has shown that a diet high in fruits and vegetables and increased exercise is conducive to better weight loss maintenance. The results for self monitoring of body weight were not conclusive against weight loss maintenance. However, it appears that breakfast eating should be encouraged for better weight control.

5.8 Effort Taken to Achieve Maintenance
In exploring the relationship between maintaining behaviour change and the ability to maintain weight loss, it is useful to investigate the effort taken to continue these strategies. Klem et al., (2000) tried to assess the effort and pleasure associated with weight maintenance by investigating a group of people in the National Weight Control Registry. They used a Likert-type scale, where they asked individuals to
indicate how much effort they put into their diet and exercise regimens and how much effort they placed in weight maintenance. They also used the same scale to assess how much pleasure is derived from these activities. By subtracting the effort ratings from the pleasure ratings for the three variables, the resulting score reflected the pleasure associated with exercise, diet and weight maintenance relative to effort. A positive result indicated greater pleasure; a negative score greater effort. Klem et al., (2000) reported that the effort associated with weight maintenance diminished as weight maintenance period increases, suggesting that it becomes more of a habit. The longer the time over which weight loss had been maintained, the effort required was less to adhere to the diet and exercise plans and therefore maintain weight. As that group was looking at a twelve month period, the authors suggest that the amount of effort required maintaining these behaviours was greatest in the earliest part of the study.

As this study was specifically looking at the first six months of weight loss maintenance, it would be assumed that the effort individuals had to place on weight maintenance was greater, relative to the amount of pleasure derived. The results achieved support this, in that it appears that all participants felt that, in managing their diet and exercise regimens, the effort required was greater than the pleasure derived. However at the point of exit from the study (six months later), all the negative scores were reduced and this indicates the trend towards the results seen by Klem et al., (2000), in that the pleasure reported was becoming greater than the effort to undertake their diet and exercise plans. Of note is that the pleasure and effort involved in maintaining weight gave a positive result, reflecting that participants felt more pleasure in achieving this desirable goal. However, it could also be considered that individuals found less effort in maintaining behaviours
because they had in fact ‘given up’ and this had not been considered by Klem et al., (2000).

Consideration in the change in scores of each group over time showed a statistical significance ($p<0.01$) was achieved in the control group in the reduction in effort placed on dietary control and the effort placed on maintaining activity plans was also approaching significance ($p = 0.07$), which tends to suggest behaviour relapse, as their weight maintenance indicated a higher degree of weight regain than the intervention group. Similarly a lesser significance ($p=0.02$) was found in the intervention group regarding the effort taken to maintain activity plans, which could suggest the behaviour becoming more habit forming and pleasurable, rather than behaviour relapse, if you base the information on knowing the group had achieved better weight control.

It is difficult to assess whether a numeric scale, as used in this tool, is successful in measuring effort and pleasure equally in this context. In addition, this study had a group that were not as successful in weight maintenance (control group) whereas the Klem study used the NWCR who were all successful weight controllers.

The results obtained from this study tend to support the fact that the control group were not managing their diet and activity plans and hence the effort scores were lower than that of the intervention group; reflecting less effort – behaviour relapse. As such, the ‘effort tool’ could be a way of assessing the motivation to maintain behaviour change in a group. Further consideration of this element of the study is needed. Winett et al., 2005 suggested that ‘satisfaction’ with the overall experience of behaviour change after several months may be more important and predictive of maintenance. As effort seems to wane towards the end of the study period it could reflect behaviours becoming more habit forming, but conversely it could reflect an
indication of a decline in satisfaction with the effort required and as such less effort is being placed and behaviours are not maintained. The Likert scale used by Klem et al., (2000) may not be sensitive enough to distinguish these subtleties. A qualitative approach to analyse attitudes may provide more accurate information by a focus group conducted with participants or a structured interview.

5.9 Management of Eating and Activity Plans

All participants had individual eating and activity plans created for them at entry to the study period. These plans were specific to the individual, reiterating activities that were used in managing weight loss and providing a reminder on how individuals had managed difficult times and to highlight what precipitates challenging times in terms of managing their diet and exercise. At the exit interview, each participant was asked if they had managed to adhere to the plans. Their responses were scored as full adherence, partial adherence, issues with physical health, mental health and, finally, not keeping to the plans at all. From the responses, there appears to be a clear correlation between adhering to the plans and managing weight maintenance. One of the intervention group reported full adherence to the plans and continued to lose weight, however another individual from the intervention group and one from the control group reported that they had managed to keep to their plans but had increased in weight. In general full adherence to the eating and activity plans caused participants to maintain their weight in the weight band. Two of the control group reported not keeping to the plans at all and they had both increased their weight above the weight band. None of the intervention group reported not keeping to the plans. Another point of interest is for the individuals who reported that they had not managed to keep to their eating and activity plans due to physical illness or low mood, these had increased their weight above the weight band in all but two or three participants.
In the case of changes in mood, a key question to be answered is: ‘does the dietary restriction produce a lowering of mood?’ The Keys et al., (1950) study of semi-starvation in normal weight men showed extreme psychological reactions and short periods of binge-eating. However, this was a normal weight population and so the individuals lost weight to a level that placed them severely underweight so individuals in this current study should not be considered to be semi-starving. The National Task Force on the Prevention and Treatment of Obesity concluded that, in comparison to individuals finding depression more common, those individuals who have lost 10% of their body weight have an improvement in depressive symptoms. Results from the NWCR, showing that individuals successful at weight loss maintenance had no adverse psychological effects of weight loss (Klem et al., 1998), emphasise the point. Therefore, those individuals reporting low mood may not be experiencing this feeling due to the presence of dietary restriction.

Wing and Phelan (2005) support the theory that those individuals with depression are less likely to maintain weight loss, whilst Wing and Hill (2001) report that those individuals in the NWCR who gained weight during their maintenance period reported increases in their disinhibition (loss of control over eating) and decreases in dietary restraint, both of these also being features of low mood and depressive symptoms. It must therefore be considered that the feeling of failing to maintain the eating and activity plans could produce the low mood, rather than vice versa.

A smaller study in a dietetic clinic, completed by Munnelly and Feehan (2002), also reported that 13% of those who had gained weight reported family or work stress as a factor. Psychological factors, including depression and negative emotions which result in comfort eating, snacking overnight and whilst watching television, plus feeling out of control over eating, are seen as barriers to making and maintaining changes (Jones et al., 2007). Therefore, the participants in this study who reported
low mood would have been vulnerable to over eating and hence weight gain. They struggled to keep their weight in the weight band, with four of the control group being above the band. However, of the three in the intervention group who reported low mood, two had managed to maintain their weight at maintenance level. This suggests that support through the email system may have helped to focus on the task at hand, improved the feeling of control over eating and provided a vehicle by which difficult emotions could be expressed to a third party as described in their comments about the use of email ‘when I felt down I felt able to contact you’.

It is known from the literature and this study that re-gainers are less likely to report adherence to a low fat diet, regular activity and weight monitoring. A qualitative study from the United Kingdom has shown that re-gainers are also more likely to delay in responding to weight gain, be less satisfied with the overall weight loss achieved and react to adverse life events by eating. Re-gainers also eat to regulate mood or avoid negative effect (Byrne et al., 2003).

Of the nine participants who reported failing to keep to their eating and exercise plans because of physical ill health, four managed to maintain their weight in the weight band. All five that gained weight had a physical illness that prevented them from adhering to activity plans and so had a reduction in activity, which is strongly linked to an inability to maintain weight loss (Kayman et al., 1990; Wing and Hill, 2001).

5.10 Considerations for Dietetic Management

The results of this study have confirmed the results of many other studies: there are elements of dietary change and other behaviours that are essential for weight loss maintenance. For dietetic treatment, assessment and preparation of the individual for weight loss maintenance appears crucial. Discussions with the individual,
regarding the principles surrounding weight loss maintenance and the issues regarding controlling their weight and overall management, should not be rushed or overlooked. From the initial out-set of weight loss, it is important to address realistic weight loss targets and confirm the benefits of weight loss to 10% of the initial weight. At the point of reaching this weight loss target, it is important to begin discussions on the factors known to be important in weight loss maintenance.

These are:

- Regular self monitoring of weight
- Maintaining a generous intake of fruits and vegetables
- Maintaining a low fat intake
- Increasing exercise in short bursts of 15 minutes

Professional support does seem to be upheld as being beneficial, both in the literature and from this study. Support appears to maintain behavioural change; however consideration needs to be taken if this support needs to be from a professional.

5.11 Behavioural Change

Continued adherence to the changes in eating and activity patterns induced during the initial treatment phase appears to be the mechanism responsible for better outcomes in weight loss maintenance. Chapter 2 discusses behaviour change and weight loss maintenance (Section 2.7.1.). It is assumed that the initial behaviour change, and the motivation to achieve that change, produces weight loss and so will also help maintain that weight loss. However, it is known that some of those who successfully lose weight fail to maintain that pattern of behaviour (Rothman, 2000).
After behaviour change, the dieter may lapse when they encounter a stimulus to break their dietary plan (Prochaska and DiClemente, 1986). Relapse as part of changed behaviour is not a permanent removal of learning. Behavioural change methods should recognise the possible influence of external cues that might be involved in any relapse (Bouton, 2000). Bouton suggests that providing several different contexts to deal with any stimulus would increase the number of contextual cues that would be triggered and so improve the rate of weight loss maintenance. The learned behaviour is then supported through any deviation. Bandura describes exercising control over troublesome situations as efficacy builders and this being a crucial aspect of self management (Bandura, 1997). (This is his fourth generation of health behaviour interventions described a dynamic approach that assist an individual in overcoming barriers to change and maintenance.) These efficacy builders or planning for relapse are 'mastery experiences' and are delivered by a mastery counsellor who addresses self doubt and set backs which are inherent in behaviour change (Bandura, 2001).

Therefore, the intervention offered by email in this study may provide participants with stronger self efficacy. People who are persuaded that they have what it takes to succeed are told that the gains in treatment verify their ability to sustain this over time – conveying positive appraisals of people’s capabilities and avoiding premature failure. Maintaining an effective outlook that gains are attainable when participants have self doubt, will help sustain coping efforts and boost self efficacy (Bandura, 1997). Therefore, the researcher’s email response, when individuals comment on their weight and describe difficulties experienced, provides that positive appraisal and a reminder of the efficacy builders that will enable maintenance to be achieved. Providing evidence of how well they have coped in the past, reminding participants
of what they have achieved all proved helpful. The researcher could therefore be viewed as the ‘mastery counsellor’.

Rothman (2000) describes a more definitive theory in the interplay between self efficacy, self- regulation and outcome expectations, so that over time behaviour can be maintained in the face of less positive outcome expectancies (failure to reach ideal weight, diabetes requiring further medication, become ill etc). This use of self efficacy and positive appraisal is a theory based approach to tailoring interactions and frequent contact, which is suggested as important for successful weight gain prevention effects, as reported by Jeffrey and French (1999). This could be seen in some cases from the intervention group (four out of eight) in Figure 4.11 who were low in mood or ill and appeared to keep their weight in the weight band.

5.12 Theoretical Basis of Internet Support

Jeffrey and French (1999) describe a theoretically based programme, delivered via the internet, combining an increased frequency of contact, making programmes tailored and interactive, focussing on physical activity and changes in eating, with provision to respond to weight change and maintaining motivation long term. All of these elements are grounded in Social Cognitive Theory (SCT) that builds on the four generations of health behaviour change:

1. information,
2. external reinforcement,
3. self regulation
4. social networking.

Winett et al., (2005) suggests that SCT is a theoretical base for developing interventions delivered via the Internet. Information and external reinforcement can
be seen to be provided through ‘Tip of the Week’ and the personal email response; whereas the email exchange could be thought of as developing self regulation and social networking. As such, this present study can be seen to be following SCT.

5.13 Tip of the Week

Of note is the development, by Winett and team (2005), of an internet based ‘Guide to Health’ which provides nutrition targets including portion sizes, energy values, physical activity tips, etc., which is similar to the ‘Tip of the Week’ element of the research. They report that individuals liked and endorsed the use of the weekly email prompt which they received. Participants did not find them annoying and felt the prompts kept them ‘on track’. This is supported by the comments of the participants in this study who were very positive about the ‘Tip of the Week,’ describing them as: “funny - hilarious”; “topical”; “I know you are there”; “a conscience reminder”; “useful”. Twenty of the twenty-five participants (80%) in the intervention group found the ‘Tip’ to be positive. Agreeing with Winett’s results, the participants in the intervention group felt the tips kept them in ‘focus’, reporting that; “they were a jog to the memory” or “a jolt to the memory”; “I would think ‘I have to get myself weighed”.

5.14 Guided Mastery & Email Support

Guided-mastery is a component of SCT and is described earlier in relation to the design of this study. The mastery-counsellor is a means by which a subject specifically addresses self doubt and setbacks in behaviour change (Bandura, 2001; Bouton, 2000). The mastery-counsellor is an influential character as they should have knowledge to share and produce ‘instructive demonstration of skills and strategies’ (Bandura, 1997). This individual is central to the efficacy of using SCT in a weight management programme (Winett et al., 2005); however Winett and
workers comment that the use of the counsellor should not be a burden on the
individual or increase the cost of production and delivery. Providing this ‘counsellor’
through the Internet therefore seems of benefit.

Tate *et al.*, (2003b) tested the feasibility and efficacy of a virtual computer assisted
weight loss programme and found that it produced the same amount of weight loss
as a real counsellor assisted programme. By six months, this difference between the
two groups had diminished. This supports the evidence from Perri and Corsica
(2002) that the virtual counsellor needs to be as interesting as the real counsellor.
On this evidence, it is suggested that the mastery counsellor is best provided by a
professional and that professional should be a dietitian, as they will have the skills
and strategies required, as described by Bandura (1997).

Additionally, dietetic professionals are in a unique position to lead development of
the area of weight loss maintenance (Hill *et al.*, 2005). They understand the concept
of energy balance and can teach clients how to maintain their weight loss through
managing their diet and exercise together. More importantly, dietitians have the
ability and training to teach skills to maintain behaviour change. Over the past 20
years, the role of the dietitian has evolved from acting as a technician to a
consultation role (Judd *et al.*, 1997). Of benefit in this study is the advantage of
having the dietitian who supervised participants through the active phase of the
weight loss conducting the ‘counsellor’ role through email contact and this is
reflected in the relationship with the researcher illustrated through the email
comments.

From the comments of participants in the intervention group, their overall experience
of email contact and ‘Tip of the Week’ was positive. Comments such as “*Saves me
coming to the hospital and trying to park!*” and “*An email takes hardly anytime to
respond to" reflects the benefit of time saved for the individual. There was also evidence that the participants recognised the benefit in professional time, "I appreciate the time it takes you to do the 'Tip of the Week'."

5.15 Relationship with the Researcher

The quality of the relationship between practitioner and client is often described as the therapeutic alliance (Egan, 1994). A client will only feel listened to, understood and trusted if the practitioner has qualities similar to those described by Carl Rogers (1959) of unconditional acceptance, genuineness and empathy. Progress and change for the client will only happen if this alliance is formed. The acceptance and respect for people as they are supports their self esteem and allows a discussion of change to occur. The building of rapport between the dietitian and the patient is important (Hunt and Hillsdon, 1996). Rapport has three essential ingredients; harmony, compatibility and the quality of the relationship. In a qualitative study by Jones et al., (2007), patients who had been treated by dietitians valued the ongoing, supportive and positive relationship with their dietitian and linked the extent of their motivation to behaviour change to their relationship with the dietitian. This has been reported by others (Munelly and Feehan, 2002). In this study, the participants had been in a therapeutic alliance with the researcher as their dietitian operating the Weight Loss Clinic. From a patient satisfaction survey, completed on a sample population of patients in the clinic (Thomas, 2006), all patients reported wishing to and benefitting from seeing the same dietitian at each appointment. Over 90% of the patients report feeling positive or motivated when they have attended the clinic, with over 92% feeling they have a good rapport with the dietitian. Over 95% of the patients surveyed felt that the dietitian understood them and, interestingly, 70% felt the dietitian did not make inappropriate judgements about them. Therefore, it could be suggested that participants who came through the weight loss clinic to the
research study had a positive relationship with the researcher and, as such, may have wished to please the researcher with their behaviour and maintenance. Therefore the success of the study may be due to the fact that the researcher already knew some of the participants. However, this should not be viewed as a limitation as the good relationship between the client and the clinician should be beneficial in delivering a behavioural change method such as the trans-theoretical model (Jackson et al., 2007). The low attrition rate in the study period could also be due to the ‘Hawthorne effect’ possibly as a result of observer interference in that participants knew they were being ‘watched’ by the researcher (Roethlisberger & Dickson, 1941) and they knew who that researcher was. The ‘Hawthorne effect’ was coined to describe the effect of researcher interest in behaviour; it is now commonly used to mean that people’s behaviour and performance change following any new or increased attention. Being part of the research study did provide attention for participants and as such this effect cannot be overlooked.

There was also a reflection of the relationship between recipients of the emails and the researcher “When I felt down I felt able to contact you”. These comments, in addition to the issues regarding guilt, lying and divulging personal issues, illustrate the positive relationship between the researcher and the individual. Participants also described emails as making them feel “special”; “made them laugh”; “felt important when I had an email from you”; “I can hear you saying them”; “I like knowing you are there”. These are all comments that support the development of a strong therapeutic alliance between the researcher and the participant, and as such the ability of that researcher/professional to be a mastery-counsellor.

Evidence of the personal feedback and continued development of self efficacy and positive appraisal was provided by comments from the participants; “Helps to know you are watching”; “nice to be able to correspond”; “like the praise for being in the
weight band'. Therefore, it can be suggested that the researcher was adopting social cognitive therapy through the email contact, to assist in self efficacy and improve the weight control of individuals in the intervention group.

5.15.1. Attrition Rates
An average attrition rate of 21% is typical in lifestyle interventions for weight loss (Wadden and Osei, 2004) and in a review of long term weight loss studies attrition rates were typically between 30 and 60% (Douketis et al., 2005). A UK study had a higher attrition rate (40%) than those reported by Womble (2004) of 34%. Attrition rate in this present study was low, with only 8% failing to attend their exit interview in the intervention group, whereas studies by Tate (2001; 2003) report levels of 22% at six months and 16% at one year respectively. A study by McConnon et al., (2007) had very high attrition levels in the internet arm of their RCT (>50%). Harvey-Berino et al., (2004) had an attrition rate of 33% in the internet group during the maintenance phase of their study, which is higher than the Tate studies and higher than in their previous study (Harvey-Berino, 2002) but lower than that achieved by McConnon et al.,(2007). Harvey-Berino and workers (2002) suggested that internet interventions are not appealing to everyone with an internet connection. However, it is possible that the attrition rate was poor in these studies due to the lack of ‘real’ therapist support or not identifying with the individual giving support, which would be supported by the work of Stevens et al., (2008). It is also possible that the level of attrition in this current study was lower partly due to the particular relationship between the researcher and the participants, as mentioned above.

5.16 Use of Email for Personal Issues
A qualitative study undertaken by Ziebland et al., (2004) aimed to understand people’s views of the internet for health information regarding cancer. They found that patients use the internet as it removes the embarrassment of face to face or
telephone interactions. Ziebland comments that this is particularly so for young men. Murray et al., (2005) reported that interactive health applications which are taken as computer based, have positive effects on users with chronic disease which obesity could be classed as being. Harvey-Berino et al., (2002) found that despite the convenience of the internet and the removal of barriers caused by shame or guilt, the majority of participants would prefer communication with other group members or therapists. In this study, there was some evidence of individuals discussing ‘personal’ information via the email contact. One young man (18 years old) revealed feelings about his mother that he had not felt able to disclose in the face to face phase of weight loss intervention. Similarly, a young woman (aged 36 years) revealed her anxiety about seeing her general practitioner for a cervical smear. This same lady called the researcher ‘sweetly’ in the email content, showing how the stereotypical roles (of professional and patient) were being broken down by the use of the ‘faceless’ internet. This was shown in Ziebland’s study (2004) where one young man commented “It’s so personal but it’s your body. I can switch on my computer at home, in total privacy”. It is almost as if individuals forget that they are communicating with a person. However, in this study, the participants were aware that it is the researcher who is reading and replying to the emails and they made this awareness evident in their comments, but the level of familiarity between participant and researcher is great. The bond of trust revealed in the electronic conversations, supports Zeibland’s results and provides new information on the benefits of this means of communication.

5.16.1. Familiarity

The familiarity of participants with the researcher was reflected in the theme of contact through email being ‘spooky’. Individuals described contact with the researcher through email as “I know you are watching”. This picks up on the Big
Brother feeling that the researcher was uncannily aware of what the individual was
doing or struggling with. Comments such as "I would think that – she'll email and ask
for my weight soon – and next time you would be there"; this lady describing the
e-mail being in the inbox as if the researcher was personally there or another lady
who described, "I talk to the screen as if you were there". Therefore, the internet
contact is perceived in a human way by participants. "It helps to know you are
watching! Think to myself. Oh! I must weigh myself." reflects the feeling that
participants found that they anticipated the contact from the researcher, there was
also some degree of responsibility reflected in the attitude of individuals to the
contact. There is also the issue of a conscience and this too reflects the need for
participants to please the researcher, "I feel guilty, I know I am not doing well
enough for you". This relationship with the researcher may well have exhibited a
positive effect on both the intervention and control groups, as both groups knew the
researcher. This would in effect introduce bias into the results making it less likely to
detect a difference between the two groups than if there had been a true control with
no contact with the researcher at all. This familiarity could also be the effect that
supports the low attrition rate in this study.

5.16.2. Degree of Contact

Most of the studies investigating the benefit of the internet in delivering weight loss
programmes report a positive correlation between internet session attendance, log­
in frequency and weight loss (Weinstein, 2006). She notes that contact through the
internet allows health professionals to reach large numbers of people but also that it
can be a 'double edged sword', as it is easier for individuals to avoid contact. A good
example of this was provided by one of the participants in this study, who said,
"After 3 months and the weight was going up I felt guilty and did not respond to you".
Weinstein (2006) suggested that personalisation of the internet encounter through
the use of weekly email contact would improve results. However, although this study provided weekly group email contact and monthly individual email contact, the results did not show a significant relationship between number of email contacts and weight loss maintenance. In contrast to this, the level of email support seemed to have encouraged the lower attrition rate, compared to other trials as noted previously, but this could possibly be more attributable to the relationship between the participants and the researcher.

5.17 ‘Tip of the Week’ as a Tool of Therapy

Knowledge, skills and understanding were all features reflected in personal feelings about the ‘Tip of the Week’ by participants in the intervention group. These features support the domains of social cognitive theory in education ("all those calorie values were so useful"); "I did not know about sausage rolls and mince pies!"), reinforcement ("clued up on weight control"); and self regulation ("The hints given helped me to manage cravings").

Of interest is the way in which participants used the ‘Tips’. Some stored them as a separate file on the computer, for reference; others forwarded the emails on to other people, thus expanding the spread of the information. Brug et al., (2003) report that delivering tailored information over the internet has been shown to impact positively on health knowledge and behaviours. They also state that individuals found the internet to be more satisfying and personally relevant, leading them to read the information more deeply and discussing it with others more often.

Another lady was so keen to keep up with the contact that she asked her daughter to access the emails over her holidays and get the information sent through by SMS. This shows the use of new media and the keenness for contact. It is also of interest that this particular lady was over 70 years old and as such reflects that age is not
necessarily a barrier to use of new technology. OFCOM (2006), reports that the increasingly new technology is used primarily with 16 – 24 year olds, but there is a growing population of older people using the Internet, colloquially known as ‘Silver Surfers’.

5.18 Use of Computers

5.18.1. Age

More people have access to the Internet but the digital divide issue, particularly regarding access to broadband, combined with issues concerning literacy, language, culture and ability, may dissuade people from accessing the internet (Neuhauser and Kreps, 2003). One of the limitations of this study is that not all participants in the weight loss clinic have ready access to the internet and email, although access is available at public libraries and internet cafes. An earlier patient satisfaction survey (Thomas, 2006) showed that 74% of the people referred to and attending the clinic had access to email through their work or at home. Therefore, one quarter of the group were automatically excluded from this study, which required participants to have ready access on a daily basis. Encouragingly, it was found that enough older people did have ready access to the internet, which allowed a balanced sample and avoided an area which had been highlighted as a possible issue. Baker et al., (2003) completed a survey of 60,000 American households, where only 7.9% of households aged over 65 years had internet access. In this study, 9 (16%) individuals were over 60 years with three being over 70. This increase in percentages of older people having computers and internet is possibly due to the increase in access to new technology over the last 5 years; 50% of homes in the UK had internet access in 2003 but this had increased to 61% in 2007 (National Statistics, 2007). It is also important to recognise that age is no barrier to the use of this technology.
5.18.2. Education and Income

Baker et al., (2003) observed strong relationships between higher education levels and internet use but did not find a relationship between income and internet use. No assessment was made with regard to the economic and educational status of the participants in this study. It cannot be ruled out that the individuals who took part in the study were of a higher educational level and this could have an effect on their ability to understand weight loss maintenance information. On the other hand, the participants were drawn from a weight loss clinic which received referrals from all local areas (urban population including city with areas of social deprivation) and therefore formed a representative group of the local economy and educational standard that had internet access. It is also known that over 60% of the WLC are in employment and a further 11% retired, therefore finances are not necessarily an issue here. In addition, since both groups were users of the internet this element had been excluded from bias.

5.18.3. Security

In 2007, The House of Lords (2007) produced the first report on internet security, reflecting the growing issues about personal security of individual information and identity fraud that occurs due to poor internet security procedures. This is a potential area of conflict for use of the internet to access health information, especially accessing information tailored to individuals. As part of the process of gaining ethical approval for this study, the design was put through the scrutiny of the local IT department at the NHS Trust. The proposal created a large amount of discussion between the senior managers of the IT department as it came to light that many health professionals were using their hospital email address to give patients opportunities to ask advice directly. Consequently, the hospital’s email policy was re-written and the director of the IT department specified the terms on which emails
should be addressed and labelled (appendix E). The email policy was very specific about having a disclaimer at the foot of each email to readdress emails if they went astray.

At the initial discussion with participants, concerning using email to keep in touch, none of them enquired about security however, at the exit interview, two of the group using email discussed the issues about security, both of whom were middle aged. Even then, individuals seemed to be concerned about the transfer of viruses rather than the transfer of personal information over the internet. One of the older ladies in the study regularly sent through virus warnings to the researcher. Therefore, the concern about security is more of an issue for older people.

5.18.4. Access to Computers

Some of the participants described issues with regard to dial up connection to the internet, if they were not on broadband. One lady said, "It will be better when I am on broad-band". Some participants used the computer terminal in their workplace to access emails, with one lady asking for transfer to her home computer address halfway through the study period, as she felt that access to the computer was so precious in work time she would prefer to read the emails at home. One lady's husband was doing an Open University course, making access difficult, "Hubby is doing OU! I hardly get a look at the keyboard!" Two individuals moved house during the six months and therefore connections were affected plus two gentlemen had computer troubles which required repair.

Three issues therefore occur when access is considered: the speed of the computer connection, physical access to the computer, loss of computer. These issues need to be considered when using this type of communication as it does affect continuity. However, mail or telephone contact can also fail through industrial action, weather
or technical problems. However of note was that although there may have been breaks in communication for several participants, only one of those that expressed difficulty did not complete the study. As such, a break in communication did not prevent continuation of the overall contact.

5.19 Overall Experience of Weight Maintenance

In general, the intervention group had a positive experience of using the email contact.

However, there were common issues about weight maintenance for all participants in the study, such as access to scales, an inability to keep control of weight and life in general!

5.19.1. Scales

It is known that regular weight monitoring is important for weight loss maintenance but being able to record your weight accurately and feeling confident in that weight record is also critical. One lady used the local GP practice to get her weight checked, having tried using the local chemist for weight checks but finding the cost to be prohibitive. She also described how having to go out to the local health centre was prohibitive as the distance to get there and the issues such as travel and weather often affected motivation.

5.19.2. Life in General

As described earlier, negative emotional states and stress are attributed to weight regain (Kayman et al., 1990). In addition, Kayman and co-workers reported the difference in the way that maintainers and relapers coped with stressful situations. They noted that maintainers believed themselves to be capable of managing any stressful events and dealt with issues effectively, whereas those that regained
weight did not deal with their problems directly and hence used food to make themselves feel better; this is supported by Marlatt and Gordon's (1985) theory of relapse.

In this study many of the participants at the exit interview discussed how issues had 'got in the way,' with 20% reporting that family life was an issue. Of note is that 64% of the participants that reported life difficulties had increased their weight and these were all in the control group, whereas the other 36% were in the intervention group and had maintained their weight. This reflects the possible benefits of participants being able to discuss their family issues with the researcher and remaining focussed on weight management. It is another reflection of the social cognitive theory that underpins the contact between the participants and the researcher.

5.20 Limitations, Confounders and Biases

5.20.1. Limitations

This study aimed to consider all the factors known to be beneficial in weight loss maintenance and attempted to support individuals in observing these factors during a six month period. However, it is difficult to assess whether other factors may have proved beneficial for some participants in maintaining or losing further weight, such as other forms of social support, dietary changes, or other exercise behaviours, that were not disclosed to the researcher. Similarly, weight re-gainers may also have had some other influences acting upon their behaviour, which went unreported to the researcher.

Having access to the internet and being able to use email was obviously one of the limitations of the study. All participants in this study used either home or workplace access to the internet. Of note is that none offered to use email via the local library or internet cafes. The researcher did not encourage this with patients in the weight
loss clinic, but this could be considered in future research as this would increase the numbers eligible for entry and remove some of the limitations.

5.20.2. Confounders

Due to the nature of the study, it is difficult to account for some of the confounders. As mentioned before, one of the biggest confounders is whether those who had lost >10% body weight found it easier to maintain their weight to a desirable level. Those having lost >10% body weight will have been in the weight loss clinic for longer. Perri et al., (1989) showed that in a 20 versus 40 week treatment programme those in the longer treatment lost more weight and had greater weight loss maintenance. Wolfe (1992) supports this in saying that the greater the weight loss the better the maintenance. The participants in this study who had lost >20% maintained that level at the end of 6 months. However some failed to maintain 19% reducing to 10% or 14% to 6%. The numbers in this group are small but their effect could confound the study result.

This is the overwhelming issue with this study as it is in a clinical setting, therefore all participants enter at different levels, having lost different amounts of weight and having a different background. It reflects normal clinical practice and as such is valuable in its results.

The specific dietary intake of participants was not measured in detail. As such, the results relating to the adherence to a low fat, reduced energy plan can only be taken from self report. It is known that obese individuals tend to under report their food intake (Black et al., 1993) and, as such, the reliability of participants reporting their current dietary practice is questionable. However, all participants were obese so all would be likely to underreport which should mean that underreporting is equally
distributed between the control and intervention groups so results should not be affected in comparative terms.

As specific information is not being sought and is not critical to this research, the reliability of the information provided could be seen to be more effective.

Six participants failed to complete the exit interview, despite letters asking them to attend. Consideration of these individuals was made at the initial analysis, prior to entry into the study. One member of the intervention group did explain that he had moved but failed to respond to contact asking for a final weight. Another member of the intervention group did not respond to any of the monthly email contacts. However, it is considered that their inability to complete the study does not affect the overall result. The four members of the control group, who did not complete the study, by attending the exit interview, were not analysed with respect to their reason for not completing and the effect that this might have on the results. One member of the control group had lost a large amount of weight prior to entry into the study and was reluctant to accept that further weight loss might escape him. Therefore, one might assume that he was disappointed at not being kept in active treatment; this highlights the importance of preparing individuals from an early stage regarding maintenance.

5.20.3. Bias

There are three forms of bias; selection, information and observer bias.

As mentioned in chapter 3 section 3.7 and 3.8, all areas of bias within the selection process were considered. All participants were taught how to monitor their weight and had their eating and activity plans drawn up before they were allocated to the intervention or control groups. However, from that point onwards the researcher was aware of the participants that were to receive the intervention.
It could be considered that the researcher placed more effort into the monitoring of individuals in the intervention group, encouraging weight loss monitoring etc. and it is important since it is a vital part of the study; it could be considered that this is the main effect of the intervention, in that the researcher was developing the role of guided mastery and, as such, the relationship between researcher and participant is crucial to the theory being applied.

As both groups underwent the same exit interview and received the same style of eating and activity plans at entry into the study, it is suggested that there is no information bias in this study. However, bias based on the ability of recall and the influence of the researcher may be important. During the exit interview, the researcher used the same questionnaires for both groups, as well as using the same tools as used prior to entry into the study, in order to minimise, if not remove, recall bias. This would also reduce the influence of interviewer bias at this stage, if not removing it altogether. However, as mentioned earlier the relationship with the researcher could be seen to be introducing bias and hence affecting both groups, making it less likely to detect a difference between the two groups.

5.21 Implications for Future Research

This study has highlighted the benefits to the NHS of using new technology to deliver long term health benefits and has shown that dietitians are in an ideal position to deliver a cost effective programme to assist in weight loss maintenance. This is the first study of its kind in the United Kingdom and as such requires validation by a more extensive trial using a bigger cohort (to assess in-group differences) provided by a multi centre study, which would test the ability of other dietetic departments to use this technique.
From the results the following design changes should be made to the study:

1. Monitoring over a longer period – 12 months initially.

2. All participants to enter the study having either achieved the same weight loss or having been losing weight for the same period of time.

3. Entry and exit questionnaires to be completed by a research assistant rather than the researcher to remove bias.

4. Conducting a larger qualitative study to investigate the attitude to weight loss maintenance.

5.21.1. Monitoring Over a Longer Period
By conducting a maintenance period lasting one year it is hoped that the results seen in this study would be repeated and due to the increase in time a significance level may be obtained.

5.21.2. Entry Criteria
A study by Frost et al., (2002) using a lifestyle weight loss programme aims to help individuals reach 10% weight loss in 6 months. Having a group of participants who had been in active weight loss for a uniform period of time would remove the confounder influence of different rates and amounts of weight lost.

This study also excluded those that were on any form of weight loss medication. If individuals had lost weight effectively using such medication and were going to continue on the medication during the study period, it could be suggested that they would still have to adhere to the eating and activity plans that had helped in the initial weight loss. As such the sample size could be increased.
5.21.3. Entry and Exit Interviews

These interviews could be altered to assist in removing bias. The eating and exercise plans should be drawn up by the dietitian who had taken participants through their active weight loss programme, as this individual understands the techniques used to assist weight loss. However the questionnaires to assess current dietary practices, effort and pleasure rating could be undertaken by an assistant to remove interviewer bias. This would also mean that the dietitian did not know who was being allocated to the intervention or control group. To assist in further helping to remove bias the emails etc could be completed by another professional rather than the dietitian who had undertaken the initial weight loss support. However, it would be vital that participants knew that they would not be communicating with the dietitian they had previously seen. This would then help to assess the effect of rapport between the dietitian and the participant and the possible beneficial effect and bias that this has.

5.21.4. Multi-centre Trial

By undertaking a multi-centre trial the research can be conducted over a larger cohort, enabling better statistical analysis. However the changes to the design of the study would have to be undertaken to ensure validity across the centres. It would also assess how transferable the method was. This study has shown the benefits of the relationship between a dietitian and the patient and it would be beneficial to see if this is transferable to other dietetic departments.

5.21.5. The Future Development of Internet Support

Further research could be undertaken in the development of other forms of internet support in addition to personalised email support. For example, web site access for information, chat rooms and the development of SMS messaging systems to
increase the Tip of the Week system. The future for remote professional contact is exciting. In the resource limited National Health Service, it provides a means to undertake personalised, supportive treatment in a cost effective environment.

5.22 Contributions Made by the Study
At the point of writing this study was the first that had recruited successful weight loss patients from a dietetic led clinic and tested the benefits of email support to support weight loss maintenance only.

The study has enabled a full analysis of a cohort of patients referred into an NHS led dietetic clinic to assess their route to successful weight loss and the implications for further management. In the current environment, where obesity management is viewed as the main target of public health initiatives, the development of a system by which clinically sound outcomes can be fostered and nurtured to enable long term benefit is exciting. For this to be shown to be effective for dietitians is encouraging and the low attrition rate suggests that the technique is welcomed by participants.

The internet is the one vehicle that allows large populations to be reached in a relative cost effective manner. Results to date have been mixed regarding weight loss. However in the realm of weight loss maintenance it has greater scope and this study has shown evidence that the internet can provide a system that can be used with great effect for health care professionals in the National Health Service.

Secondly, this study has supported the behavioural changes that are known to be of effect in maintaining weight loss. The emphasis in educating individuals to maintain weight loss should be on improving and maintaining exercise and the consumption of fruits and vegetables. Breakfast is also important for long term weight maintenance.
Individual experience of the use of the internet to support behaviour change has been shown to be beneficial. However and possibly more importantly, the relationship between dietitian and patient is seen to be a key factor in behaviour change which underpins future success in health benefit.

5.23 Conclusion
This study has made a contribution to the knowledge of dietetics. It has used a regularly operated weight loss clinic in the National Health Service and has considered further professional development to assist in governance and management. The limitations of the study are present, in part, because of the nature of the varied demographics and achievements of all patients in making behaviour change. As such the contribution of the study has more benefit for those in general practice who are seeking to explore new ways of working to meet the demands of an ever increasing workload.
Chapter 6: Conclusion

6.1 Development of the Study

The major challenge in the treatment of obesity is maintenance of weight loss. Much research has been placed into the weight loss programmes that produce initial weight losses of 10% (Wing, 2004), which are known to produce clinically effective benefits (Goldstein, 1992) but maintaining that weight loss appears to be problematic. Some studies quote 50% of successful weight loss patients regaining that weight within one year (Wadden et al., 1989); with others stating one third regaining weight within one year of weight loss (NIH Technology Assessment Panel, 1993).

Within the United Kingdom, few NHS dietetic clinics provide detailed maintenance information during the treatment phase. Continued therapist contact has been shown to be effective in improving the maintenance of weight loss (Perri and Corsica, 2002). However, with the increasing numbers of obese and overweight individuals in the United Kingdom, continued therapist contact is not a cost effective service, in manpower planning, which can be considered, in a National Health Service where resources are limited.

Rapid increases in the number of people with access to the internet have made this medium viable and logical for public health intervention. It provides a low cost initiative which can reach large numbers of individuals. The United Kingdom is the biggest user of the internet in Europe. Over 60% of the population have internet access, with 80% having broadband connection which facilitates faster response times from the internet. The internet provides an ideal medium as it combines information provision with personal contact through email. Therefore, many researchers have sought to investigate whether weight loss maintenance can be achieved if individuals are given professional support by a remote system.
This study set out to investigate the benefit of using email to support individuals who had been successful in a weight loss clinic run by a dietitian in the NHS, to investigate the factors that assist in weight loss maintenance and to consider the experience of participants using this remote system of contact.

Individuals were randomly assigned to an intervention or control group. The intervention group received weekly email contact reminding them of various dietary, behavioural and activity tips to maintain behaviour change. In addition, each month the intervention group members received a personal email message to encourage each participant to weigh themselves and report that weight to the researcher.

6.2 Weight Loss Maintenance
At the end of the six month study period there was no statistical difference, between the intervention group and the control group, in their ability to maintain weight in a weight band which was ±2kg over their end weight at entry into the study. More of the participants in the intervention group maintained their weight in the weight band or continued to lose weight but this did not reach statistically significant levels. As such the hypothesis was not proven. However, the finding that the percentage weight loss maintenance was significantly different between the two groups after the study period is of clinical importance. Similarly the statistical difference in the rate of weight regain in the control group in comparison to the intervention group, suggests that over a longer period of time there would be a difference between the control and intervention group. Although this study did not include a face to face maintenance support as a comparison, the results from this study provide evidence that email contact provides support that can deliver clinically meaningful weight maintenance/loss for participants.
Overall this study showed that preparation for weight loss maintenance enabled participants to maintain their weight loss within the study definition of maintenance of weight loss and meeting the standard put forward by Stevens et al., (2006)

6.3 Factors Used to Maintain Weight
The results of this study also support those found by others (Wing and Hill, 2001; Wing and Phelan, 2005; Wyatt et al., 2002; Anderson et al., 1999; Colvin and Olsen, 1983), in that eating fruit and vegetables benefits weight loss maintenance as does exercise. The type of diet used to lose weight, and therefore forming the basis of dietary targets, does not seem to influence weight loss maintenance, which is in agreement with Kayman et al., (1990); Wing and Hill, (2001). This study also supports the report that physical illness and low mood are both linked to poor weight loss maintenance (Byrne et al., 2003). However, this study showed that the frequency of personal email contact did not improve weight loss maintenance which does not agree with the findings of Tate et al., (2001).

6.4 Dietetic Management
In relation to dietetic management, this study shows the need for dietitians to prepare individuals for weight loss maintenance. This study clarifies that dietitians should discuss with patients:

- The benefits of 10% weight loss and maintenance of that weight loss long term
- Regular self monitoring of body weight
- Maintaining a generous intake of fruits and vegetables
- Maintaining a low fat intake
- Increasing exercise in short bursts of 15 minutes
• Management of difficult times such as physical illness, low mood, etc.

• The benefit to maintaining a regular consumption of breakfast

6.5 Attitude to Maintenance
An assessment was made of the effort that participants placed on their weight loss maintenance. The results indicated a trend towards the results seen by Klem et al., (2000), in that towards the end of the study period the pleasure reported was becoming greater than the effort to undertake their diet and exercise plans. Of note is that the pleasure and effort involved in maintaining weight gave a positive result, reflecting that participants felt more pleasure in keeping their weight in the weight band and that this then outweighed the effort they put into maintaining dietary and activity behaviours. This could indicate behaviours becoming more habit forming or an element of ‘laissez-fair!’ As such, the scale that Klem et al., (2000) used is not specific and this might be better established using a more qualitative approach through focus groups or structured interviews.

6.6 Experience of Intervention
The participants who made up the intervention group of this study were very positive about the experience. Sixty eight per cent of the group reported that they liked the experience of email. The themes that people discussed about their experience included: “it saved time”, “feel special”, “created a focus”, “loved the Tips” and “learned from the Tips”. Eighty per cent of the intervention group described the ‘Tip of the week’ as good, with comments such as making them laugh; providing a reminder; and being educative. Therefore, it is suggested that the intervention offered by email in this study may provide participants with stronger self efficacy. In providing email support and contact, the researcher conveyed positive appraisals of people’s capabilities and provided strategies to avoid premature failure. When participants have self doubt, the maintenance of a positive emphasis on the fact that
gains in ability are attainable, will help sustain coping efforts and boost self efficacy (Bandura, 1997). Therefore, when individuals comment negatively on their weight and describe difficulties experienced, the researcher's email response provides that positive appraisal and a reminder of the efficacy builders that will enable maintenance to be achieved. It is suggested that, in this study, the researcher could be viewed as the mastery counsellor, as described in social cognitive theory (Bandura, 1997).

Results from Tate et al., (2003) and Perri and Corsica (2002) tested the feasibility and efficacy of a virtual computer assisted weight loss programme and found that it produced the same amount of weight loss as a real counsellor assisted programme. By six months, this difference between the two groups had diminished. This supports the comment by Winett et al., (2005) that the virtual counsellor needs to be as interesting as the real counsellor. On this evidence, it is suggested that the mastery counsellor is best provided by a professional and that the professional should be a dietitian, as they will have the skills and strategies required.

Additionally, dietetic professionals are in a unique position to lead development of the area of weight loss maintenance (Hill et al., 2005). They understand the concept of energy balance and can teach clients how to maintain their weight loss through managing their diet and exercise together. More importantly, dietitians have the ability and training to teach skills to maintain behaviour change.

6.7 Use of Behaviour Change Theory

In this study, the qualitative analysis, conducted through the exit interview, gives evidence for the development of social cognitive theory, underpinning the interaction between the researcher and participants. Winett et al., (2005) describes a theoretical base for weight gain prevention with social cognitive theory. Participants discussed issues regarding feeling guilty, lying and personal issues; illustrating the
positive relationship between the researcher and the individual. Emails were also described as making them feel "special"; "made them laugh"; "felt important when I had an email from you"; "I can hear you saying them"; "I like knowing you are there". Evidence of the personal feedback and the continued development of self efficacy and positive appraisal, through the emails sent to participants from the researcher; support the use of social cognitive theory within this study. The comments made by participants support the development of a strong therapeutic alliance and, as such, the ability of the researcher to be a mastery counsellor. The use of the internet to deliver this style of behavioural support is put forward by Winett et al., (2005), who suggest it is a means to deliver a cost effective, tailored support system that can reach large numbers of the population to meet public health demands.

6.8 Professional/Patient Relationship
A strong therapeutic alliance has been developed by the researcher (a registered dietitian) and the participants (patients) in this study. This is possibly because the participants had all been successful graduates from the weight loss clinic that the researcher provided. The study conducted by Jones et al., (2007) showed that patients who had been treated by dietitians valued the on-going, supportive and positive relationship with their dietitian and linked the extent of their motivation to behaviour change through their relationship with that individual. How much this relationship affected the results of this study cannot be measured but the affect should not be overlooked; but nor should it be viewed as a limitation, as the good relationship between the client and the clinician should be beneficial in delivering a behavioural change method such as the trans-theoretical model (Jackson et al., 2007). Therefore, the establishment of the researcher as a guided-mastery counsellor and the development of social cognitive theory within the email support
rely on the therapeutic alliance that the participants have with the researcher via the email support.

Consequently, this study supports the role of the dietitian in developing a positive therapeutic alliance and delivering a programme by which individuals can move from active treatment and have support from the same professional through a remote system.

6.9 Clinical Application of the Research

Dietitians are the key professionals involved in weight management and treatment, within the NHS. To date, the concentration of analysis of practice and research development has been on developing weight loss strategies, however it is clear that maintenance of the weight loss achieved is crucial for clinical benefit and for cost effectiveness.

This study has taken a dietetic service operating in a general hospital within the NHS and considered a means by which individuals can be moved from active treatment into a system of supported maintenance. The system involves minimal dietetic time and costs are limited to dietetic time only (estimated as £11.42 per patient for six months). Costs will be smaller if the number of patients receiving the emails is increased.

The results show that weight maintenance and further weight loss are more likely with the individual receiving regular dietetic contact through email. Email provides a system which is enjoyed by patients. They become familiar with the mechanism and use it to divulge information they had not revealed in face to face contact. Overall they report the regular emails as being positive, an aid to memory and educational. Keeping a channel of communication open allows individuals to feel able to make contact should they require it. The email contact appears to fit the requirement of
guided-mastery, enabling individuals to increase their self efficacy in dealing with problems and variations in their behaviour. There is also a patient benefit in terms of reduced travel costs and time avoided for attendance at a hospital appointment.

The study investigated the role of various behaviours in assisting weight loss maintenance. The study confirms the results of others in the beneficial effects of eating fruits and vegetables in maintaining weight loss. Of clinical importance are the beneficial effects of fifteen minute periods of activity on weight maintenance. Whereas it has been considered that 30 minutes of exercise, five days a week, is desirable for weight management, this study shows that as little as 15 minutes each day, over five days/week, can be effective in keeping weight in control. As dietitians are not able to prescribe specific exercise, the ability to encourage smaller incremental increases in exercise is helpful.

The study also supports the benefits of preparing patients for an achievable weight loss and discussing weight loss maintenance with them at regular intervals during active treatment.

6.10 Future Research
This study has not produced a conclusive result with regard to weight loss maintenance. The statistical calculation of sample size was based on finding a difference of 5kg between the two groups. This was an ambitious target and proved unlikely to achieve in a six month period. It also set a smaller sample size that made it difficult to show in-group changes.

A further, more extensive, study is required to test whether a larger cohort over a longer period of time will deliver a statistical significance both between the two groups and illustrate changes within group. A study period of twelve months would
be helpful to assess any further decline in actual and percentage weight loss after the initial six month period.

A multi-centre study is of benefit as it would test if this system is transferable from one site to another. It also tests out the role of the researcher in this study, where the relationship was positive and certainly beneficial, but it could have also introduced bias. Therefore a multi-centre study would help to test this effect.

The use of the internet offers a novel and fast approach to the delivery of health information and support, available 24 hours a day, seven days a week. As most health sites available over the internet are unlicensed, provision of a service through nationally registered professionals under the umbrella of the National Health Service must be welcomed. A service that would allow interaction with a ‘real-life’ professional would be beneficial as studies by others have shown that websites providing information are not viewed positively by individuals (Tate et al., 2003). The increasing rate of obese and overweight people in the United Kingdom is not slowing. Effective treatment programmes that can be tailored to individual need and delivered through a cost-effective medium are required. Dietitians are ideally placed and suitably qualified to assist in this exciting new venture and this study has set the scene of what is possible.

6.11 Concluding Remarks
This study is unique in that it has used a cohort of participants from an NHS dietetic-led weight loss clinic and tested the benefit of continued dietetic contact through email on weight loss maintenance.

The results of the study have shown that participants found the email intervention to be an acceptable form of contact. There is evidence that the intervention reduced the rate of weight regain seen in the study period. Overall the consumption of fruit
and vegetables, regular activity, consumption of breakfast and managing low mood assist weight loss maintenance.

The study has shown that email can be a useful adjunct to normal dietetic care at minimal cost in time and finance. The study is worthy of further investigation with a larger cohort and across many dietetic departments.
Chapter 7: References


Bandura A. (1997) *Self-efficacy the exercise of control.* Freeman and Co., USA.


Medical Research Council (2000) ‘A framework for development and evaluation of RCTs for complex interventions to improve health’.


Chapter 8: Appendices

Appendix A: Literature Search

Healthcare databases were accessed using the National Library for Health and the Healthcare Databases Advanced Search facility. Searches were taken of titles and abstracts.

The search strategy was defined as follows:

Concept 1 (Patient): Obesity (obes*); overweight
Concept 2 (Intervention): Patient support; communication; email, electronic mail, computer communication networks, internet; behaviour therapy (behavio* ) and change; relapse prevention
Concept 3 (Comparison): Dietetics, dietitian, diet treatment (diet*)
Concept 4 (Outcome): Weight loss maintenance (weight loss main*); sustained weight loss, weight reduc*, weight control

All search terms were also used linked to thesaurus mapping, plus linked to the explode selection.

Papers were limited to those applying to adults, written in English. No criteria were placed for research design. Date limits were 2008 – 1995.

Abstracts were reviewed for relevance and the various numbers of papers were found for the topics listed below in table A1
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Appendix B

Appendix Bi: Secretion of Leptin Proportional to Lipid Adipocyte Volume
Hunger stimulates the release of Ghrelin in the stomach.

Eating causes a decrease of Ghrelin.
Encouraging Appetite.

Ghrelin travels to the brain to activate appetite in the hypothalamus.

Appendix Bii: The Action of Ghrelin on Food Intake.

Stimulates Appetite.
Appendix C
Mosaic Typing (ref. www.nomadplus.org.uk)

Suburban comfort:

Suburban comfort comprises people who have successfully established themselves and their families in comfortable homes in mature suburbs. They have more money on their hands due to less challenge of interest payments.

Age 45 – 64
Married (60.9%)
2 person household
Good diet and health
Connected to Internet and Daily Mail reader

Happy Families:

Contains people where the focus is career, home and family. They are a younger age group, married or in a permanent relationship raising children in a post-war home. Focus of expenditure is home and garden.

Age 30 – 44
Married (58%)
Couples with dependent children
Good diet and health
Connected to the Internet and digital TV
Appendix D

Project Title: Does Dietetic Contact Via E-mail Help with Weight Loss Maintenance?

[Abbreviated Title: Weight Loss Maintenance Project]

Patient Information Sheet

You are being invited to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Talk to others about the study if you wish.

• Part 1 tells you the purpose of this study and what will happen to you if you take part.
• Part 2 gives you more detailed information about the conduct of the study.

Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

Part 1

What is the purpose of the study?

This research project forms part of the study for a Doctorate of Clinical Practice being undertaken by the dietitian managing the Weight Loss Clinic.

We are currently unable to offer help, in the maintenance of weight loss, to patients who have successfully lost weight. We hope to investigate the benefits of keeping in touch with the dietitian by e-mail and whether this will help individuals maintain the weight they have lost. Those using e-mails will be able to tell the dietitian their progress on a monthly basis and ask for help on particular problems they are having.

Why have I been chosen?

We are asking all patients who have successfully lost weight in the weight loss clinic if they have access to e-mail and, if so, whether they would like to take part.

It is up to you to decide whether or not to take part. If you do, you will be given this information sheet to keep and be asked to sign a consent form. You are still free to withdraw from the study at any time, without giving a reason. A decision to withdraw, or a decision not to take part, will not affect the standard of care you receive.

What will happen to me if I take part?

We are looking at weight loss maintenance. Once you have achieved weight loss to a desirable level, you will be taught how to keep your weight in check. A weight graph will be provided and you will be taught how to monitor your weight and take action to control weight increases out of your weight band.

Sometimes we don't know which way of treating patients is best. To find out, we need to make comparisons between different treatments. We put people into groups and give each group a different treatment; the results are then compared to see if one is better.

To try to make sure the groups are the same to start with, each patient is put into a group by chance (randomly). Therefore, you may be allocated to the group that has contact with the dietitian by e-mail every month (the experimental group) or you could be in the group that will see the dietitian after six months (the control group).
Individuals in both groups will have a 20/30 minute consultation with the dietitian at the end of the six month period, made at your convenience, to find out how you have got on. You will be weighed on the department scales at that time and you will be asked to complete a questionnaire about your weight management experiences over the previous six months. You will be involved with the project for a total of 7 months maximum.

What do I have to do?

Those in the e-mail group will be contacted by the dietitian each month, using the e-mail address. The dietitian will ask patients to report their most recent body weight and share any problems they may be experiencing. They will also be asked what, if anything has changed for them and if they have any specific questions that the dietitian can answer. Specific dietary problems can be answered but diet diaries are not required unless there are problems.

Those in the control group will have to adhere to the programme discussed at the last appointment, i.e. monitoring their weight regularly, keeping a record of their weight and taking actions to keep their weight within the agreed weight band. They will have to attend an appointment with the dietitian at the weight loss clinic after six months, to check on progress and assess how things have gone.

Following the trial period, further arrangements will be made to provide the individual with support if this is necessary.

We cannot promise the study will help you; however, it is hoped that you will gain some benefit by maintaining your weight loss. Primarily, the information we get might help improve the future treatment of people with obesity.

Will my taking part in the study be kept confidential?

All the information about your participation in this study will be kept confidential. The details are included in Part 2.

Any complaint about the way you have been dealt with during the study or any possible harm you might suffer will be addressed. The detailed information on this is also given in Part 2.

If you withdraw from the study, you can request that your data be withdrawn from the study by contacting the dietitian in charge of the Weight Loss Clinic.

If you consent your General Practitioner will be informed of your acceptance to take part in this study. This means that he can tell us of any changes to your medication that may affect your weight.

If you feel uncomfortable with reporting your weight at any time, you can withdraw from the study. If you have particular issues regarding your weight we can discuss other methods of treatment.

What will happen to the results of the research study?

It is intended to publish the results of the research study in a medical journal or at an obesity study conference. No patients will be named. If you wish, you can also receive a copy of the results, so you can see what we have discovered!
Part 2

What if relevant new information becomes available?

Sometimes, new information becomes available during the course of a research project about the treatment that is being studied. If this happens, your dietitian will tell you about it and discuss whether you want to or should continue in the study. If you decide not to carry on, your dietitian will make arrangements for supervision of your weight loss maintenance in the community. If you decide to continue in the study, you will be asked to sign an updated consent form.

If the study is stopped for any other reason, you will be told why and your continuing care will be arranged.

What will happen if I don’t want to carry on with the study?

You have the right to withdraw from the study at any time. All we ask is that you inform us that you are doing so, so that the information you have provided to date can be noted.

Complaints

If you have a concern about any aspect of this study, you should ask to speak with the dietitian who will do her best to answer your questions (023 92286500 ext 2659). If you remain unhappy and wish to complain formally, you can do this through the NHS Complaints Procedure. Details can be obtained from the hospital.

Will my taking part in this study be kept confidential?

As the study is using e-mail as a means of passing your personal details to the dietitian (e.g. weight), you will be asked to sign a form to ensure that you understand that you are using a non-secure means of communication. It is possible that an electronic failure will re-route your e-mails and, therefore, that your personal information may be intercepted by another person. Every attempt will be made to ensure that your e-mails are kept secure. All e-mails will be printed off in hard copy and kept with your research records. Electronic copies will be held in a password-protected, personal folder on the NHS computer network, which is defined as secure.

Your dietetic records are kept for 5 years in a locked file or confidential store, before they are destroyed. This is compliant with the Data Protection Act 1998.

All information collected about you during the course of the research will be kept strictly confidential. Any information about you which leaves the hospital will have your name and address removed so that you cannot be recognised from it.

Who is organising and funding the research?

This research forms part of the Doctorate of Clinical Practice being undertaken by the dietitian running the Weight Loss Clinic. The research is organised by the dietitian and supervised by the University of Surrey.

Who has reviewed the study?

This study was reviewed by the Portsmouth and South East Hampshire Ethics Committee.

Thank you for taking time to read this information sheet. It is hoped that you will consider taking part in the project. Please do not hesitate to ask the dietitian if you have any questions that have not been answered in this sheet.
Appendix E

Patient Identification Number for this trial:

CONSENT FORM

Title of Project: Does dietetic contact via e-mail help with weight loss maintenance?

[Abbreviated Title: Weight Loss Maintenance Project]

Name of Researcher: Denise Thomas, Chief Dietitian

Please initial box

1. I confirm that I have read and understand the information sheet dated October 2006 for the above study. I have had the opportunity to consider the Information and ask questions and have had these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without my medical care or legal rights being affected.

3. I understand that relevant sections of any of my medical notes and data collected during the study may be looked at by responsible individuals from the Dietetic Department Portsmouth Hospitals NHS Trust, where it is relevant to my taking part in this research.

4. I agree to my GP being informed of my participation in the study.

5. I agree to take part in the above study.

_________________________       _______________       ______________________
Name of Patient               Date                        Signature

_________________________       _______________       ______________________
Researcher                   Date                        Signature

When completed, 1 for patient; 1 for researcher site file; 1 (original) to be kept in dietetic notes
The Internet and use of e-mail is not a secure environment. For instance, making a small mistake in an e-mail address may result in the message being received and read by the wrong person. The information you include in e-mail messages as part of the Weight Loss Maintenance Project may be personal, therefore it is important for you to take steps that minimise the risk of your e-mail messages going astray.

You are therefore advised to follow the following procedures:

- In the Subject line of your e-mail type only "WLMP." Do not include your name or other identifying details.
- Use your forename or your surname plus your reference number (given when you began the project) in the body of your e-mail text, not both names. This will enable you to be identified by the dietitian, but not by anybody else if the e-mail goes astray.
- Provide the dietitian with your weights and food records, as appropriate, but provide no additional information that may identify you.
- Open a new e-mail for each correspondence, rather than using the 'reply to' facility from previous e-mails.
- On all e-mails to Denise Thomas, at the top of the e-mail, before your e-mail text, insert the following declaration:

  This e-mail message is confidential and intended solely for the use of Denise Thomas, Dietitian at Portsmouth Hospitals NHS Trust. If you are not the intended recipient you are advised that you are not authorised to read, print, copy or forward this message in any form. You are politely requested to inform the sender this message has been sent to you in error and to delete the original message.

For each e-mail message you send to Denise Thomas you will receive a return message confirming that the message has been received.

You can withdraw from the study if the use of e-mails becomes too difficult for you.
Declaration Of Acceptance Of Risks Associated With E-Mail Correspondence

Patient's Name:

Patient's E-Mail Address:

I agree to take part in the Weight Loss Maintenance Project, which will involve me using e-mail to contact the dietitian, Denise Thomas at e-mail address:

denise.thomas@porthosp.nhs.uk

I acknowledge that Portsmouth Hospitals NHS Trust is not responsible for any unauthorised disclosure of personal information, such as my weight or food record, during e-mail transmission from me to the dietitian, subject to overall compliance with The Data Protection Act 1998 and the NHS Code of Practice for Records Management.

I will use the e-mail address above for contacting Denise Thomas and she will use the address I have provided above to contact me. I will double-check e-mail addresses prior to sending messages.

I understand that copies of my e-mails will be printed and stored in my dietetic notes. The original e-mail will be deleted from the electronic systems.

Signed: .............................................................. Date:..........................

Copy for Participant

Copy for Research file.
Appendix G

Department of Nutrition & Dietetics
St Mary's Hospital

02 January 2009

Dear Dr

Re: Patient Details

This is to inform you that the above named patient has agreed to take part in a research study being undertaken by the Department of Nutrition and Dietetics.

Having been treated in the Weight Loss Clinic at St Mary's Hospital your patient has successfully lost weight. They have now reduced their original body weight by x% and as such have made significant health benefit.

The department is currently undertaking a project as part of the Doctoral studies of the Chief Dietitian operating the Weight Loss Clinic. This project is trying to answer the question: "Does dietetic contact via e-mail help with weight loss maintenance?"

Your patient has agreed to take part in this study.

The patient will be assigned to one of two arms of the study. One arm is looking at the individual having e-mail contact with the dietitian to record their body weight and trouble-shoot any dietary problem(s) they may be having. Contact with the dietitian will be monthly. The second group is also encouraged to record their weight but they will not have regular contact with the dietitian. At the end of six months both arms of the study will be invited to attend the clinic to see the dietitian face to face, and record their progress and discuss the difficulties in weight loss management.

Should you have any questions regarding this study then please contact me on the above number. The study has been approved by the Ethics Committee of Portsmouth and South East Hampshire and the Research and Development Unit of Portsmouth Hospitals Trust.

Yours sincerely

Denise Thomas MPhil. RD
Chief Dietitian
Appendix H

Dear Mrs Thomas

Full title of study: After a period of successful weight loss does monthly e-mail contact with a dietitian enable individuals to maintain their weight loss over a further 6 months?

REC reference number: 06/Q1701/117

Thank you for your letter of 12 November 2006, responding to the Committee’s request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised.

Ethical review of research sites

The Committee has designated this study as exempt from site-specific assessment (SSA). There is no requirement for [other] Local Research Ethics Committees to be informed or for site-specific assessment to be carried out at each site.

Conditions of approval

The favourable opinion is given provided that you comply with the conditions set out in the attached document. You are advised to study the conditions carefully.

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

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An advisory committee to South Central Strategic Health Authority
Research governance approval

You should arrange for the R&D department at all relevant NHS care organisations to be notified that the research will be taking place, and provide a copy of the REC application, the protocol and this letter.

All researchers and research collaborators who will be participating in the research must obtain final research governance approval before commencing any research procedures. Where a substantive contract is not held with the care organisation, it may be necessary for an honorary contract to be issued before approval for the research can be given.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

With the Committee's best wishes for the success of this project

Yours sincerely

Mr David Carpenter
Chair

Email: GM.E.hio-au.SEHREC@nhs.net

Enclosures: Standard approval conditions SL-AC2

Copy to:
Dr Sara Faithfull
EHIMS, University of Surrey
Duke of Kent Building
University of Surrey
GUILDFORD
GU2 7TE

An advisory committee to South Central Strategic Health Authority
Appendix I

Portsmouth Hospitals NHS Trust

My Weight Monitoring Plan

Weight Range

My weight range is between: ___________________________Kg

______________________________St.lb.

I will weigh weekly on the same scales at the same time of day and record my weight on the weight graph.

If my weight crosses the top line of my weight band, or if I have been gaining weight steadily I will:

- Review my current eating and activity plan
- Make changes to the above if either one has slipped from my agreed plan.
- If something else has changed for example my medication, etc. I will make a note and continue to review my weight, eating and activity.

Eating Plan

I have made the following changes to my diet:

- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

It is my intention to keep to these changes over the next 6 months
Activity Plan

I am currently doing:

•
•
•

I intend to keep this level of activity over the next 6 months.

Problem Areas

I have listed below the areas where I find it difficult to keep my plan going:

•
•
•
•

Remembering how I have managed these in the past will be helpful to me.

Denise will contact me via e-mail each month. I will let her know how my weight is being managed and any particular problems I have had.

Denise’s e-mail address: denise.thomas@porthosp.nhs.uk

She will entitle each e-mail as: WLMP

The following disclaimer will be placed at the top of each e-mail

This e-mail message is confidential and intended solely for the use of Denise Thomas, Dietitian at Portsmouth Hospitals NHS Trust. If you are not the intended recipient, you are advised that you are not authorised to read, print, copy or forward this message in any form. You are politely requested to inform the sender that this message has been sent to you in error and to delete the original message.

I can respond to Denise’s e-mail by using the return button, I may wish to copy the disclaimer into the body of the text of my message. I will not put both my Surname and Christian name in the text of my e-mail, but will use either name plus my personal identification number

Signed: Date:
My Weight Monitoring Plan

Weight Range

My weight range is between: _________________________ Kg

______________________________ St.lb.

I will weigh weekly on the same scales at the same time of day and record my weight on the weight graph.

If my weight crosses the top line of my weight band, or if I have been gaining weight steadily I will:

- Review my current eating and activity plan
- Make changes to the above if either one has slipped from my agreed plan.
- If something else has changed for example my medication, etc. I will make a note and continue to review my weight, eating and activity.

Eating Plan

I have made the following changes to my diet:

- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

It is my intention to keep to these changes over the next 6 months.
Activity Plan

I am currently doing:

•
•
•

I intend to keep this level of activity over the next 6 months.

Problem Areas

I have listed below the areas where I find it difficult to keep my plan going:

•
•
•
•
•
•
•
•
•

Remembering how I have managed these in the past will be helpful to me.

My review appointment with the Weight Loss Clinic is:

Signed: Date:
### Effort and Pleasure Associated with Weight Maintenance

Please read carefully the statements below and rate your response by circling the figure that most applies to you.

1 = very little/ not at all with a range leading to 8 = a lot/ extremely.

1. How much effort do you devote to your diet?
   - 1 2 3 4 5 6 7 8

2. How much effort do you devote to your exercise?
   - 1 2 3 4 5 6 7 8

3. How much effort do you feel you devote to your weight maintenance
   - 1 2 3 4 5 6 7 8

4. How much attention is required to follow your diet plan?
   - 1 2 3 4 5 6 7 8

5. How much attention is required to follow the activity plan?
   - 1 2 3 4 5 6 7 8

6. How much attention is required to maintain your weight?
   - 1 2 3 4 5 6 7 8

7. How much pleasure do you get from doing exercise?
   - 1 2 3 4 5 6 7 8

8. How much pleasure do you get from eating low fat/ calorie restricted meals?
   - 1 2 3 4 5 6 7 8
9. How much pleasure do you get from achieving weight stability?

1 2 3 4 5 6 7 8

10. How much pleasure do you get from watching television?

1 2 3 4 5 6 7 8

11. How much pleasure do you get from reading a book?

1 2 3 4 5 6 7 8

12. How much pleasure do you get from sitting in the sun?

1 2 3 4 5 6 7 8

13. How much pleasure do you get from listening to music?

1 2 3 4 5 6 7 8

14. How much pleasure do you get from going to a restaurant?

1 2 3 4 5 6 7 8

15. How much pleasure do you get from eating a high fat indulgent meal?

1 2 3 4 5 6 7 8
Appendix K

Weight Control Strategies

The list below helps us to see the weight loss strategies you are using and those you need to develop. Please answer each question as honestly and accurately as you can.

1. Do you have lower fat foods in the house?
   Yes  No

   If yes: which ones do you buy?

2. Do you have low sugar foods in the house?
   Yes  No

   If yes: which ones do you buy?

3. How many portions of fruits and vegetables do you eat in a day?

4. Do you eat breakfast daily?
   Yes  No

   If yes: what do you normally have?

5. When did you last drink alcohol?
   This week  Last Week  Last month

6. When did you last go to a restaurant for a meal?
   This week  Last Week  Last month

7. When did you last have a take-away meal?
   This week  Last Week  Last month

8. How often do you weigh yourself in a month?

9. Do you keep a regular food diary?
   Yes  No

10. How often do you take exercise (lasting over 15 minutes) in a week?
Appendix L

Tips of the week


7/12/06

Oh Christmas is looming fast and there are lots of treats around!

BE CAREFUL!!!!!

Look at this;
Mince pies can be as high as 260 cals each and it’s not always the luxury ones that are the highest!
A slice of chocolate Yule log can also be 260 Cals, whereas a piece of fruit cake with only a dried fruit and nut topping can be much lower at 160 Cals. However the dreaded iced Christmas cake can be as high as 300 Cals a slice!!!

Being polite by taking just one does not always work!!!

18/12/07

Hardly a tip, but it was sent to me and I thought it was so funny (and apt!!)

Twas the Month After Christmas (Dieting)

Twas the month after Christmas, 
and all through the house, 
Nothing would fit me, 
not even a blouse.

The cookies I’d nibbled,  
the eggnog I’d taste, 
At the holiday parties,  
had gone to my waist.

When I got on the scales,  
there arose such a number! 
When I walked to the store,  
(less a walk than a lumber).

I’d remember the marvellous,  
meals I’d prepared;  
The gravies and sauces,  
and beef nicely rared,

The wine and the rum balls,  
the bread and the cheese,  
And the way I’d never said,  
"No, thank you, please."

As I dressed myself,  
in my husband’s old shirt,  
And prepared once again,  
to do battle with dirt,
I said to myself, 
as I only can, 
"You can spend a winter 
disguised as a man!"

So-away with the last, 
of the sour cream dip, 
Get rid of the fruit cake, 
every cracker and chip.

Every last bit of food, 
that I like must be banished 
Till all the additional, 
ounces have vanished.

I won't have a cookie, 
not even a lick. 
I'll want only to chew, 
on a long celery stick.

I won't have hot biscuits,, 
or corn bread, or pie, 
I'll munch on a carrot, 
and quietly cry.

I'm hungry, I'm lonesome, 
and life is a bore-
But isn't that what, 
January is for?

Unable to giggle, 
no longer a riot. 
Happy New Year to all, 
and to all a good diet!!!!

26/01/07

Hope you are all well. 
The tip this week - Make a shopping list before you go food shopping, don't cruise the aisles looking for tempting treats especially when hungry. Sit down before you go shopping and think about the week ahead. What are your main meals likely to be? Then plan to buy the relevant foods for preparing these meals. Remember buy one get one free is false economy, when you are eating foods just because you had them 'free'. They are not free when you increase your weight by another few pounds and clothes do not fit!

07/02/07

Cold weather makes you want to eat more, so be careful! Cooked vegetables have the same energy value as salads. So make half your plate cooked vegetables and remember that instant gravy is relatively low in energy and therefore will make a warming dinner and this will still be within your calorie limit.
Have you got a sweet tooth? With Valentines Day you may want to eat chocolate, but it is so high in calories. The lowest calorie chocolate treat is a Curly Wurly with a two finger Kit Kat coming a close second! Cadbury Option drinks are useful at 40 kcals. Marshmallows are low in fat as are wine gums (but watch the quantity of the latter)

I am sorry not to have been in touch last week, I was away on a half term break. I hope you are all checking your weight, by keeping to the same time of day and weighing in the same clothes.

Mark your weight on your weight chart and check how it fits with last weeks weight etc. Any changes in weight ask yourself what has changed from last week to this.

Hello, isn't the weather lovely today?

Hope this finds you all well and the same weight or less than last week!!

Base your meals on starchy foods such as bread, cereals, rice, pasta and potatoes. Try to choose wholegrain varieties when ever you can. Portion sizes are important: 2 slices of bread, a coffee mug full of cereal, a tea cup of boiled rice, a coffee-mug of pasta and a potato the size of your fist.

Most of us should be eating more fish as it is a good source of protein and contains vitamins and minerals.

Aim for 1 -2 portions a week and try and include some oily fish. Oily fish contain a certain type of fat called omega 3 fatty acids, which help to keep her hearts and our brains healthy. Oily fishes are: salmon, mackerel, fresh tuna, sardines, pilchards, eel. Bake or steam or grill the fish to reduce energy levels rather than frying or using a rich sauce.

To stay healthy we need some fat in our diets. What is important is the amount and type that we eat. Saturated fats can increase your cholesterol and increase your chance of heart disease.

Foods that are high in saturated fats are:
- Meat pies, sausages and meat with visible fat
- hard cheese
- butter and lard
- cakes and pastries
- biscuits
- cream, soured cream and crème fraiche
- coconut oil, palm oil and coconut cream.

For a healthy choice use just a small amount of vegetable oil or reduced-fat spread instead of butter or lard. When you eat meat chose lean cuts and try reduced fat cheeses. It is best to make cake, pastry and biscuits for high days and holidays only!!

...and a little bit of cake wouldn't go amiss, would it?
29/03/07

Here is this week's Tip!! With the warmer weather we should try to drink 6-8 glasses of water or other fluids a day. Fluids can be plain water, tea or coffee. You can also drink low sugar cordials and fizzy drinks but take care over fruit juice. Only one glass per day as it is high in energy and sugar.

Water is best and it is cheap!!

04/04/07

Easter is upon us and thoughts turn to chocolate. It is a high energy compound with a high proportion of fat and sugar.

How do you know if a substance is high in sugar?
Take a look at the label. The ingredients list always starts with the biggest ingredient first. Watch out for other words that are used to describe sugar such as: sucrose, maltose, glucose, fructose, hydrolysed starch, invert sugar and corn syrup. If one of these is near the top it is likely to be high in added sugar.

Another way to get an idea is to look at the Carbohydrate figure which states: of which sugars. This figure can't tell you how much sugar is ADDED but it can tell you how much sugar is in the product. If you look in the 100g column:
A LOT of SUGAR will be 10g or more
A LITTLE of SUGAR will be 3g or less.

So take care this Easter, a little amount of chocolate will be fine, but too much will send your weight up!

12/04/07

Fresh fruit and vegetables are important for health and are low in energy helping us to reduce total calories yet fill us up!

Try to eat 5 portions of fruits and vegetables a day. It might be easier than you think.

Try adding up your portions in a day. For example:

- a glass of fruit juice and a sliced banana with your cereal at breakfast time.
- a side salad at lunch
- a pear as an afternoon snack
- a portion of peas with your main meal.

Choose from fresh, frozen, tinned, dried or juiced: but remember potatoes count as starchy food and not as a vegetable! You can only count fruit juice as one portion. Too much orange juice etc will increase calories so we restrict it!

19/04/07

Breakfast can help give us the energy we need to face the day, as well as some of the vitamins and minerals we need for good health.

Some people skip breakfast because they think it will help them lose weight. Missing a meal does not help us lose weight and it isn't good for us, because we miss out on essential
nutrients. Research shows us that eating breakfast can actually help people control their weight. This is probably because when we don't have breakfast we're much more likely to get hungry and snack on foods that are high in fat and sugar such as biscuits, doughnuts, pastries or potato snacks. So try a bowl of wholegrain cereals with some sliced banana and a glass of fruit juice for a healthy start to the day.

25/04/07

We need to get more active to lose weight. Physical activity is a good way of using up extra calories, and helps control weight. Try to be more active every day. For example, you could try to fit in as much walking as you can to your daily routine. Try to walk at a good pace.

Try getting off the bus one stop early or parking at the supermarket at the furthest from the door. Remember the stairs in the home are a good way of doing the stepper at the gym. Going up and down the stairs a few times will help you to lose weight and trim up!!

Enjoy the sunshine - go for a walk!

03/05/07

Thinking of the hot weather and those ice lollies and ice creams. Try to avoid ice cream as they are high in fat and sugar - even when they say things like non- milk solids etc. Why not try making your own low calorie lollies? If you get a low sugar squash and make a strong dilution and pour it into ice lolly moulds, and freeze for 2 hours and you will have virtually calorie free snacks that are refreshing!!

10/05/07

Much of the eating we do when we aren't hungry, or the cravings we have, is a habit-like response to a variety of triggers. These can be external, such as the sight or smell of food, or internal or emotional-led, such as a response to stress, anger, boredom or emptiness.

A food diary helps to recognise this trigger. Watch for any emotions that trigger inappropriate eating. Keep 'binge' foods out of the way so they do not tempt you so much. Try and occupy yourself with other rewarding activities e.g. having a bubble bath, reading a magazine, going for a walk etc. This may help to distract

16/05/07

An idea for lunch boxes is something that frustrates many. Thought I would write down some delicious ideas for the summer: Make sandwiches colourful. Add several different coloured vegetables to brighten up a sandwich and also bulk them up.

Use bread roll and scoop out the centres to make a small hole that you can fill with vegetables.

Pitta bread is also good to use this way.

Try a tortilla wrap to wrap around a filling.

Remember for these last two you could save on the spread on the bread. Butter and margarine are only used as a waterproof agent in sandwiches - to stop the bread going soggy! So if you are making them and then eating them you can do without the spread. This could save you 50 - 100 cals per sandwich!!
25/05/07

Hope you all have a good bank holiday weekend.

The tip for this week is; Be a conscious eater - try to make conscious choices about what you eat, especially when tempted to overeat. Ask yourself 'I can eat this if I want to, but do I really feel like it?' You can then chose to eat some of it, or not as you will have considered the consequences. It will help you to feel in control and achieve your goals, and stop you feeling deprived.

29/05/07

In this dreadful weather it is very tempting to sit in doors and eat!!! Try to be as active as possible. Remember that the stairs and your cupboards can make a good exercise area.

Going up and down stairs a few extra times a day will help burn up calories. Stretching to reach high cupboards also tones up muscle. Standing to do the ironing and washing up also uses up calories. Try to be as busy as you can to maximise your energy expenditure.

08/06/07

Most of you have been managing your weight successfully for many months now. Well done.

Remember to weigh yourself weekly in the same clothes and at the same time of day. Use the same scales and write down what weight you are. If your weight has increased think - what have I done that is different? Are you eating extras? Are you doing less exercise? Have you taken new medication? All of these factors will make a difference. If you know what the problem is it is easier to try and bring your weight back on track next week. If you don't know what the problem is then please e-mail me and we can try and sort things out.

14/06/07

Feeling peckish in an evening? Then take advantage of using the cheaper soft fruit at the moment. Melon, strawberries, raspberries, nectarines and peaches are all delicious chopped up together with orange or apple juice poured over it makes a lovely fruit cocktail. Low fat natural yogurt can be poured over to make a filling sweet treat!

21/06/07

Watch your portion sizes. It is often difficult to manage to keep the amount you eat in check. Often a good way of making sure is to divide your plate into halves. One half should be vegetables only and than half of the other half (one quarter) can be the protein (meat/fish) portion and the other quarter your starch portion (potato/rice/pasta) Take care on sauces and gravies as they add extra high calories. Instant gravy is a good substitute.

28/06/07

Try and eat with no distractions - easier when you have no family! But your best efforts can be sabotaged by doing something else during meals. A study showed that women who ate whilst listening to a story on the radio ate 70 more calories per meal than people who ate with no distractions. I wonder how much more you might have eaten if you were watching Neighbours or Corrie!?
06/07/07

Drink plenty to keep yourself hydrated. Have at least 6 - 8 glasses or cups a day of low calorie drinks. Take more if you are hot or exercising.

The aim is to keep your urine a light straw colour. Drinking plenty stops you feeling hungry and helps you to feel full.

Spicy tomato juice, vegetable juice or a berry fizz (berries with fizzy water added) and great between meal or early evening satisfiers to stop the nibbles or that early evening glass of wine!

12/07/07

Fill up on low energy density foods. Foods like vegetables, salad, fruit, chunky soups, low fat pasta sauces, low fat dairy foods, porridge, beans, fish and lean meat are the great building blocks of every meal and snack. They have low energy density (low number of calories per bite) and are not only healthy but help you fill up for longer!!

20/07/07

Eating out is now a regular part of life and restaurant food can be high in calories. Skip high fat butter, dressings, garlic bread, cream or cheese sauces, battered foods and indulgent puddings unless shared between 4! Pile your plate with lots of veg or salad and watch the alcohol, drink plenty of water.

27/07/07

Try practising saying no, especially as those of you who have lost a lot of weight, may feel that people try and encourage you to be 'naughty'. I call these people detractors, they are jealous of your success and are keen to see if they can get you 'off the rails'. Take care Remember you are looking after your own needs and you need to focus on what you are trying to achieve. Remember they are only jealous!!

06/08/07

I am late this week so you will get two one for last week and one for this week! Handy measures help in making sure you keep to portion sizes.

A coffee mug is useful for measuring out flakes of cereal - it measures 30g in general
A coffee mug also weighs out pasta shapes (before cooking), one mug is 100g
A tea cup when half filled with rice (before cooking), measures 100g too.

All of these are useful when trying to make sure you aren't too generous. Another tip on Friday!

10/08/07

With the hot weather the barbecues are out in full force. You can consume a lot of energy through the old barbecue so be careful.
To have a healthy meal, ensure you have:

3 portions of bread, cereals and potatoes - one portion is one slice of bread, two portions would be a bread bap.

2 portions of vegetables (a cereal bowl of salad is one portion)
1 serving of meat - one chop, one steak, 2 sausages, one 4oz burger

Watch the fat through adding extra sauces and marinades and of course the alcohol!!
Happy grilling!!!

17/08/07

A word about breakfast!

It gives energy and vitality and improves concentration, it also prevents nibbling on sugary and fatty foods - so people who eat breakfast tend to be lower in weight than those who don't. Cereal is a good breakfast food and combined with milk or yogurt increases protein and satisfaction. Avoid sugar coated cereals.

Speedy cooked dishes: Beans on toast, bacon and tomato on toast (grilled) are good at filling you up.
Poached, boiled or scrambled eggs on toast are also very nutritious and can keep you going for ages!! Fruit such as fresh, stewed are delicious chopped over cereal or canned fruit can be added to yogurt as long as it is canned in natural juice.

Take care over unsweetened fruit juice as it is high in natural sugar and calories - only one glass a day!!

24/08/07

A long weekend for us this weekend. Time when you can easily stray from the straight and narrow, so take care.

When you have finished your meal wait 10 minutes to allow your food to settle in your stomach. Then take a drink after you have eaten preferably something hot as it will increase your satisfaction from your meal. Do not attempt to leap up from the table and do the washing up etc., it puts you back in the kitchen and it’s tempting to continue to eat.

30/08/07

I was on Radio Solent today talking about diet pills and their use. It brought it home to me (and I hope the listeners) that weight loss is always about the energy equation. Keeping your dietary intake within a 1500kcal limit and your activity as active as possible.

Some of you have been very successful with weight loss and this is because you have made and kept to, significant dietary changes. Keep at it and remember you will succeed. Regular weight checks will help to keep you focussed. When you don't know your weight you are more likely to increase and find yourself weight gaining. If you are in trouble please come back to me
10/09/07

Hope you are all well. The year is moving on and thoughts of autumn approach! Try and make sure you keep your vegetable intake up during this time. Vegetables are low in energy and high in bulk. They reduce the energy content of your meal and fill you up.

Make half of your plate vegetable, any sort including baked beans. This means that one quarter of your meal need be protein and the other quarter the starch item. Give it a try and help control the urge to munch

14/09/07

Write a list of your targets and what you want to achieve with your weight loss and maintenance. Have a mini target in place so that you can be focussed and not get bogged down by trying to do too much. Seeing your goals written down can sometimes help when your motivation is slipping. Ticking them off when they have been achieved is also very rewarding!!!

21/09/07

Fat is the highest energy content of all nutrients. It has 9 cals per gram and you should be trying to keep to 60g which is 30 per cent of a 1500 cal diet.
So keep watching those fat percentages.

01/10/07

Hope things are going well for you. Extra activity is crucial at this time of the year. We are all becoming couch potatoes as the evenings draw in. Try doing extra incidental activity e.g. walking up and down stairs, parking the car furthest from the supermarket door. Generally be more active. The slogan is MOVE MORE, MORE OFTEN!!

08/10/07

Hasn't the weather turned cold and damp. Quite a grey day!
People often ask me about vitamin supplements. Generally if your diet is varied you do not require extra vitamins. However some people especially those that are over 50 years or teenagers, do require an extra boost. Vitamins A, C and E are the antioxidants and are helpful for health. However, always take a multi vitamin preparation if you think you need one. One that contains all the vitamins is essential.

Other than that make sure you EAT A RAINBOW - that means taking highly coloured fruits and vegetables. That way you get vits A, C and E!!

15/10/07

If sweets are your downfall start by keeping fewer 'temptations' around. When you are craving for a sweet treat, try one of the fewer calorie ideas:

Fresh or tinned fruit (in natural juice), or dried fruit with low fat ice cream, frozen yogurt or low sugar jelly are useful.
Sugar free milk pudding made with skimmed milk and sweetener or custard made this way also with fruit.
Cereal bars are also helpful as long as they are around 100kcals
Sometimes meals lack flavour and moisture. Adding a sauce can help with this. However extra calories come this way also.

Thought I would list some items you may find acceptable:
Brown sauce is half the cals of tomato ketchup! 9 versus 20 per 10g (1 tablesp) portion.
Low calorie salad cream is also half the cals! 29 versus 52 per tablespoon.
Gravy is always best if instant as made from meat juices the energy level rockets! from 20 to 87 calories per 2 fl oz.

Items such as mustard, Worcestershire sauce, Tabasco, vinegar (inc balsamic and mint sauce) are all almost calorie free!!!

Taking a hot drink at bedtime often helps with sleep and can take away hunger pains before sleep.
However some of the drinks are high in energy.
A mug of milk is 150kcls. To keep it a bit lower try semi skimmed or skimmed milk.
Watch malted milk powders. Cocoa powder is the lowest in energy - not drinking chocolate.
cocoa is only 9 kcals per teasp and drinking chocolate is 18kcals per teasp.

Ovaltine is 14 kcals a teasp and Horlicks 19 - if you use low fat Horlicks it is down to 12.
An ideal one to try is Cadburys Options drinks as they are only 30 kcals per sachet and they do not need milk adding.

Hope the weight management is going well. This week lets concentrate on exercise:
Cycling for 30 minutes is equivalent to 2 chicken nuggets or 1.5 digestive biscuits = 118 cals
Swimming for 30 minutes is equivalent to 1.5 bags of crisps or 5 chicken nuggets = 295 cals
Dancing for 30 mins is equal to 2 digestive biscuits or an eighth of pizza = 133 cals
Walking briskly for 30 mins is equal to 2 Jaffa cakes or 7 teasp of sugar = 103 cals.

Hope your weight management is going well.
Fancy something sweet?
It's often tempting to grab a biscuit but they are dreadfully high in calories.
Most chocolate covered biscuits like Penguin, Kit Kat etc are over 100 kcals often as high as 130kcals.
Digestive biscuits are also very high in energy: 2 = 140 kcals (even those covered in chocolate!)
The same calories apply to sandwich biscuits e.g. bourbon, custard creams
Semi sweet biscuits are the best option.
Ginger nuts 2 = 91 cals, Rich Tea biscuits 2 = 70 kcals, 2 pink wafers = 70 kcals.
The test is to ration yourself!!! But with a cup of tea in the evening these may be sweet enough to hit the spot!

Yogurt is a good source of protein and calcium. However there are so many on the market that has different calorie values.
Greek yogurt is high in cals! Containing almost 200 kcals a pot! If you go for the Shape low cal Greek ones it is a better product and lower in cals. In fact the lowest calorie value yogurts are the diet ones. These are very low fat and reduced added sugar and so less than 100 cals a pot.

Ordinary low fat yogurts are in the region of 130 kcals, and those Muller corner yogurts are more of a sweet treat and are at 230 cals or 250 depending on the type - so those are not for you chaps!!

30/11/07

Breakfast cereals are a good source of nutrition. They are a balance of protein carbohydrate and vitamins and minerals. The latter are normally fortified in most cereals. All cereals are low in fat.

The ones that are high in calories are those that have sugar added and those with nuts. So be careful! As for a portion size: remember a mugful is enough of any flake cereal and then 1 or 2 biscuits of the biscuit type like Weetabix. Be careful also about those muesli's they are high in fruit and nuts so sugar and total calories are higher. Portion sizes also need to be controlled

06/12/07

Oh Christmas is looming fast and there are lots of treat around!

BE CAREFUL!!!!! Look at this;
Mince pies can be as high as 260 cals each and it's not always the luxury ones that are the highest!
A slice of chocolate Yule log can also be 260 Cals, whereas a piece of fruit cake with only a dried fruit and nut topping can be much lower at 160 Cals. However the dreaded iced Christmas cake can be as high as 300 Cals a slice!!!

Being polite by taking just one does not always work!!!

14/12/07

Another Christmas tip!!
All these celebrity chefs talk about adding sauces to the meal on Christmas day. Be careful!
A serving of bread sauce is 80 calories
Cheese sauce added to the cauliflower is 158!
Cranberry sauce is 72 cals per serving.
The biggest problem is the turkey gravy as we tend to eat a large portion. Made with meat juices: 87 cals and only 20 cals if made without - so take care!

24/12/07 Entitled Tip of the week or should I say the season....

Hi everyone
Happy Christmas!
Hope you are all well and not getting too stressed!
Seems silly to give you a Tip this week - would you listen to it? but then it is so possible to gain 7lbs over Christmas - so be careful!

Its buffet/snack items that you need to be careful about:
Sausage rolls=311 Cals for one!!!
1oz of peanuts=143 Cals!!!
Cheese and pineapple=60 Cals
Bombay mix=121 Cals for 1 oz.

Have a good time

28/12/07

The Tip is early this week as I am on holiday next week.
Hope you are all well

Thought as its new year I would chat about alcohol calories.
1 pint of most beers and lagers is 150 - 170 calories
a small glass of wine is between 75 and 80 kcals, but most of us drink 6 fl oz glasses now;
120 kcals a go
Sherry and port are around 60 - 80 kcals.
The lowest in calories is spirit = 50 kcals per pub measure. Add slim line mixer and you have
a low calorie drink, but several drinks can add up and then....

You find yourself getting hungry and eating more -
so be careful!

11/01/08

Well a new year and I must admit with the weather being so bleak I think its time to raise the
topic of exercise!!!
There is no doubt to be successful with weight loss and maintenance exercise is essential.
Any degree of regular activity is important.

Walking is good, and going up and down stairs is helpful too. It does not have to be gym
membership - just something you can do regularly.

21/01/08

Drinking enough is important, especially when on a diet. Try to reduce the amount of caffeine
drinks you have (coffee, tea and cola) and introduce more water or low calorie water based
drinks e.g. squash etc.

The aim is 8 glasses/cups/mugs a day. Add them up over the last 24 hours and see how
many you had. The more water based rather than caffeine based, the better it will be.

01/02108

When you eat food your brain will not register your pleasure from food, if you are involved in
watching TV, reading books tec. Therefore, sometimes you may notice that you finish your
meal and feel able to go and eat something else. Take care!

Try to not be distracted and try and enjoy every mouthful. Put your knife and fork down
regularly whilst you eat so your stomach can catch up with your mouth and you get
maximum satisfaction from your food

15/02/08

Hope you are all well. Is it time for 'think before you eat'?
It's a good tip to ask yourself 'Am I really hungry?"
Sometimes hunger can be in the mouth, which is normally because of feeling stressed, or emotional. Stomach hunger should be recognised and then decide what ‘Do I want to eat? Sweet, savoury, hot or cold?’ Sometimes in taking time in knowing how to satisfy ourselves we get more out of food.

25/02/08

Well you have survived Valentines day and Shrove Tuesday now we head to Easter.

Isn't it strange how all our festivals are linked to food. Yet I am sure many of you are thinking of the summer and wanting to be able to wear smaller clothes etc. So take care over the snacks. By keeping to three meals a day you may well manage to keep your energy intake down.

Concentrate on planning meals and knowing what you will eat especially at evening meals.
Appendix M

Dear Denise

I can confirm that the sample size calculations for your study, based upon values estimated from the article by Toubro & Astrup (1997), are correct. These assume that you will compare the change in weight between the two intervention groups using a simple two sample t-test.

Please feel free to contact me should you require further help at the analysis stage of your project.

Regards

Bernie

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Bernard Higgins

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Clinical Paper

Helping adults maintain weight loss: A randomised controlled trial of email contact versus standard care.

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Key words:
Weight loss; dietitian; email contact; maintenance; controlled trial

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The authors declare that they have no conflict of interest. No funding declared.

DT conceived and designed the study, analysed and interpreted the data and drafted the paper.

VV & JL worked on the development of the initial design of study, oversaw the research process and critically reviewed the paper.
Helping adults maintain weight loss: A randomised controlled trial of email contact versus standard care.

ABSTRACT

Background

Weight loss maintenance is a crucial element of effective weight management. Professional face to face contact is known to be beneficial but costly in supporting weight maintenance. In the USA, the use of the internet to maintain contact and motivation with clients has been explored. This study seeks to investigate the benefits to weight maintenance of dietetic support via email in an NHS setting.

Method

Fifty-five patients who had lost ≥5 % body weight were assigned to either an intervention group (weekly email messages and monthly personal email message, n=28) or a standard care control group (n=27). The level of weight maintenance, plus dieting and exercise behaviours, were recorded in both groups after 6 months.

Results

A statistically significant number of participants in the intervention group maintained a clinically beneficial percentage weight loss (p = 0.05), however there was no statistical difference between the two groups in terms of absolute weight loss maintenance after 6 months. The control group regained weight lost at a significantly greater velocity (p = 0.02) than the intervention group. There were correlations between the amount of fruits and vegetables eaten and exercise episodes against weight change in maintenance.

Conclusion

Remote dietetic support using email can be used effectively in the NHS to assist in maintenance of percentage weight loss and reduce weight regain velocity. Behavioural targets, including eating fruits and vegetables and undertaking exercise are beneficial in maintaining weight.
Introduction

Traditionally, the role of dietitians in obesity management has been to help individuals lose weight. Results from dietetic led weight loss clinics have been mixed (Glenny et al., 1997; Cowburn and Summerbell, 1998) but achieving a clinically effective target of loss of >5% body weight at time of referral in a reasonable period of time through dietetic led clinics is now widely accepted (Frost et al., 2002; Summerbell, 2007). However, weight regain is a problem after all dietary and behavioural intervention for obesity. Anderson et al., (1999), showed that, of those achieving 5% weight loss, 50% maintained this after a year only if provided with a maintenance programme which included: education on self monitoring; management of ‘perceived failures’ e.g. food binges, stress eating; regular eating of low fat, high fibre diet; increased exercise.

If dietitians are to be effective in the management of obese people, not only do they have to enable clients to demonstrate effective weight loss, they also have to address the issue of weight loss maintenance. Continued face to face professional support for clients who have lost weight is not a cost effective option in a resource limited NHS. A more efficient means by which professionals can support individuals in weight loss maintenance is required.

The National Institute of Clinical Excellence guidance on obesity management (NICE, 2006) has suggested further investigation of the use of the Internet to reach larger populations. A review completed by Weinstein (2006) selected 8 American studies in which 5 used information via the Internet to achieve weight loss and 3 focussed on weight maintenance. Four of the weight loss programmes produced positive results and results from the three for maintenance were equivocal. More recently Wing et al., (2006) assigned a group of successful dieters (having lost a mean of 19.3Kg over 2 years) to control (receiving newsletters), face to face support
or internet support. Both intervention groups used the same techniques for assisting weight maintenance (as listed from Anderson, 1999). The face to face group achieved the best weight loss maintenance, with 27% having regained 2.3Kg at six months against 47% in the control group. The rate of weight regain in the internet group was lower than in the control group.

Therefore, from a public health perspective, the use of the internet for prevention of weight regain is desirable, as it is able to reach large numbers in minimal professional time. Weinstein (2006) suggested that any intervention that can personalise the internet experience, e.g. professional contact, may improve communication and results. This study aimed to demonstrate that a programme that offers personalised internet support by email contact may prove beneficial in supporting weight loss maintenance using the techniques known to be effective (Anderson et al., 1999; Wing and Hill, 2001) especially during the crucial initial phase of maintenance where weight loss behaviours need to be firmly established (Klem et al., 2000).

This study investigated a group of patients, who have e-mail access and have lost a meaningful amount of weight through an NHS dietetic led weight loss clinic, and tests whether having e-mail contact with the dietitian preserve that weight loss over a period of six months. An additional investigation of the factors that either encourage or inhibit self-management of weight maintenance/continued weight loss in all participants was also analysed.

Materials and methods
This study was approved by the Portsmouth and Isle of Wight Ethics Committee, the Information Technology department and Research and Development Unit of Portsmouth Hospitals Trust and the University of Surrey Ethics Committee.
Participants

Patients were recruited for the study directly from the twice weekly weight loss clinic (WLC) run by a single dietitian (DT) within the Hospital Trust. All patients referred are ≥ BMI 30, with or without co-morbidities. The mean weight loss of the whole clinic is 4.4Kg (6.6%) of initial body weight. Standard care is provision of individually tailored dietary advice to achieve a meaningful weight loss goal (≥5% initial weight) to a point where weight loss slows. Patients learn to use evidence based techniques, to assist with weight maintenance after discharge from clinic.

Eligibility

All patients who had reached a weight loss target (≥5% initial weight) were asked if they had access to email and if they would be willing to participate in a study to assess the benefit of further contact with the dietitian through e-mail. Patients who were applying for bariatric surgery, those without email access (through home or community); and those who were on weight loss medication were then excluded from the study. Those with binge eating disorder and learning difficulties were also excluded on the basis that there were specialist dietetic clinics for these groups. Of those approached, 18 did not have email access, all eligible participants with email access agreed to take part (55). Full informed consent was obtained from each subject prior to entry into the study. See figure 1 for participant flow.

Intervention

Details of preparation for weight loss maintenance were provided to all participants in both groups prior to randomisation. They were given a weight maintenance chart with instruction to keep their weight within a ±2Kg weight band using an individualised diet and activity plan. Both before and after the study period, each
participant completed a previously validated questionnaire designed to assess the concept of effort that individuals applied to various factors of weight maintenance (Klem et al., 2000). In addition, current dietary habits were also recorded during an oral interview using a questionnaire that was designed for the purpose but which has not been formally validated. Each participant was asked their current dietary practices, how many portions of fruit and vegetables they regularly ate, how frequently they ate breakfast, take-away foods, drank alcohol and the number of exercise episodes lasting ≥15 minutes taken each week.

Participants allocated to the intervention group were informed that they would receive a weekly e-mail from the dietitian called ‘Tip of the Week’. This gave various dietary, behavioural and exercise tips. They were informed that the dietitian would send a monthly e-mail requesting a report of their current weight. Patients in the control group received no further contact from the dietitian but were asked to return to the clinic in 6 months. Therefore, both groups of patients were in effect discharged from active care at the point the study commenced and arrangements were made to attend the clinic in 6 months to record their body weight and discuss the problems they had in maintaining their weight loss and, for those in the intervention group their thoughts on the use of email. All participants repeated the questionnaires for current dietary practices and effort and pleasure scores. Figure 1 shows the diagrammatic structure of the study.

Sample Size

Sample size was calculated assuming a proposed final weight difference between the intervention and control group of 5kg. An alpha level of 0.05 and a power of 80% (SD ± 0.8) gave a sample size of 24 for each group to detect a 5Kg difference
between the groups. An examination of the throughput of patients at the WLC suggested that the sample size would be achieved, within 12 to 15 months.

**Randomisation**

Each participant was randomly assigned to the intervention or control group. A series of random numbers were generated and allocation was made in groups of three to email and control groups alternately. The numbers were then put in sequential order and the allocation was placed in consecutively numbered sealed opaque envelopes. The researcher (DT) opened the relevant envelope and told the participant which group they had been assigned to, so that relevant consent forms could be completed on the use of email.

**Statistical Methods**

Statistical analysis was completed using Statistical Package for the Social Sciences software (version 14 for windows: SPSS Chicago, Illinois).

The data were checked for normality using the Kolmogorov-Smirnoff test. For the data giving a significance of <0.05 it was not normally distributed and therefore non-parametric tests were used i.e. Mann-Whitney u test (instead of t-tests), Wilcoxon matched pairs (instead of paired t-tests) Correlations between variables used as markers of adherence with weight maintenance behaviours were explored using either Pearson's or Spearman Rank correlation.

**Results**

**Participant Flow**

A total of 49 participants completed the study. Attrition rates were low with 4 (8%) being lost to follow up in the control group and 2 (4%) in the intervention group. One in the intervention group moved to London and electronic contact was lost, the other
never responded to monthly emails; others in control group failed to respond to letter requests asking them to get in touch.

**Baseline data**

The demographics of the participants are shown in Table 1. The mean body weight, BMI and percentage weight loss achieved by all participants at entry to the study were not significantly different, indicating that the randomisation process had been successful. At the end of the 6 month study period (Table 2) there was a significant difference between the percentage weight loss of the two groups (\( p = 0.05 \)). The control group having maintained 7\% percentage weight loss compared to 10\% maintained in the intervention group.

The amount of actual weight loss maintained was calculated by subtracting the body weight at the end of the 6 month study period from the initial presentation weight before treatment. At entry to the study the weight loss achieved was not statistically different between the two groups. There was however, a greater difference between the weight loss maintained of the two groups (10.9 vs 7.8 kg) on exit from the study, but this was not statistically significant. A test of the amount of initial weight lost against the amount of weight loss maintained over time (the initial weight loss achieved at entry compared to the amount maintained at six months) using Wilcoxon matched pairs showed a significant reduction in the control group (11.2 – 7.8 kg) (\( p = 0.003 \)) whereas this was non significant in the intervention group (12.4 – 10.9 Kg) (\( p = 0.278 \)). This suggests that the email intervention was successful in reducing the rate of weight regain over a six month period in comparison to no professional support (Standard Care).

The rating scale for the effort questionnaire was based on a Likert scale rated 1 – 8 with 1 reflecting least effort and 8 being the most amount of effort. Participants rated
themselves on various parameters for their concept of effort and pleasure in weight maintenance, keeping to a diet and undertaking exercise. The score for effort was then subtracted from the pleasure score, to provide an overall concept of how much effort an individual felt they were exerting to achieve weight maintenance on each factor. A negative score was seen as more effort being placed than a positive one, the range of score could therefore be -7 to +7.

Comparison of the median values for all scores between the groups showed no significant difference at entry to and exit from the study. However, the control group (n= 24) showed a significant change to a more positive score during the study period, indicating a reduction of effort in maintaining dietary change (p = 0.008) and exercise (p = 0.07) during the six months (Table 3). For effort to maintain weight there was no significant change in the control group. In the intervention group, there was no significant difference in effort to control diet or effort to maintain weight, however there was a significant change in their effort to undertake activity (p = 0.028) indicating that at the end of the study, participants were finding it more pleasurable to undertake physical activity.

Figure 2 illustrates a modest but significant correlation, for the whole group (n=49) (r = -0.352) between the amount of fruit and vegetables eaten and the ability to maintain a stable weight. Therefore, the larger the quantity of fruit and vegetables eaten, the more likely it is for the participant to have maintained their weight loss or continued to lose weight.

Figure 3 shows the same trend, with an increase in the number of 15 minute exercise episodes taken per week improving the ability of participants to maintain weight loss. The effect size is larger than for fruit and vegetables (R=0.27) showing a modest but significant correlation (p<0.001).
Figure 4 shows the results of adherence to dietary targets compared to the amount of weight change over the study period. The results of Spearman’s correlation between the degrees of weight change over 6 months against adherence to the dietary targets showed a significant correlation (\(\rho = 0.57; p < 0.001\)) (see figure 4). The results suggest that those who reported low mood (scored as 3) and physical illness (scored 4) increase weight above the top of the weight maintenance band (marked in red). Individuals who reported physical illness did not keep to their activity targets and their inability to maintain weight loss at this time supports the results of the correlation between exercise and weight loss maintenance.

Discussion

Most of the previous studies investigating the use of the internet to support weight loss have been conducted in the United States of America. This study sought to investigate whether a system using email could support weight maintenance and behaviour change after discharge from a NHS weight loss clinic. Weight maintenance needs to be considered for good governance and with the increasing number of obese people presenting for treatment, weight maintenance is critical to caseload management. The results of this study show a small benefit in the intervention group. Although the amount of weight loss maintained in the intervention group is not statistically significant, the percentage weight loss maintained does indicate some clinical benefit, with 10% weight loss maintained over six months. When the amount of weight loss maintained over time is considered, there is a statistically significant change in the control group, suggesting that this group has a more rapid decline in the ability to maintain weight loss (11.2 – 7.8kg), than the intervention group, which is in agreement with Wing et al., (2006). The fact that the intervention group did not experience this significant regain in weight could demonstrate effective management in the long term. Rapid regain is
likely in the first 12 months post intervention (Svetkey et al., 2008); this study suggests that email intervention could reduce this. When considering the effort undertaken to maintain dietary and exercise behaviours, the Likert scale used was not particularly sensitive. Nonetheless, it showed that the control group had reduced effort in managing their diet, over 6 months, whereas the reduction in effort of the intervention group focussed on exercise.

The constant reminder provided, to the intervention group by the weekly email ‘Tip of the Week’, was noted by participants as a ‘jog to the memory’ and as such could be maintaining behaviour change. Winett et al., (2005) suggested that social cognitive theory is a theoretical base for weight loss maintenance using the internet and as such, the contact through weekly email could be said to develop self efficacy.

Behaviours known to support weight loss were investigated in both groups. There was a modest negative correlation between the amount of fruits and vegetables eaten and weight change over the six months. This suggests the advantage of eating greater amounts of fruits and vegetables to support weight maintenance, which is in agreement with Schick et al., (1998). Similarly, the increased frequency of undertaking small (15 minute) bouts of activity shows a stronger correlation against weight change over 6 months (p<0.01) as supported by evidence from the National Weight Control Registry in the USA (Kayman et al., 1990). When adherence to dietary targets was investigated there was a strong correlation between maintaining all behavioural targets and weight maintenance.

There are limitations in this study. All participants entered the study at different amounts of weight loss, but at the end of treatment offered by the NHS. For some, they were not in maintenance phase and as such continued to lose weight (10%). Others had lost a significant amounts of weight >20% initial body weight and others
only 5%. When using a clinical population it is difficult to screen for these differences and to obtain a large study cohort. The number of participants in this study was sufficient to analyse the hypothesis but nonetheless restricted the statistical analysis.

It was important to undertake such a study in this population as it reflects current clinical practice and the dilemma dietitians face every day.

**Conclusion**

Dietitians should carefully consider the preparation of patients for weight loss maintenance, following successful weight loss. Specific education relating to increased consumption of fruits and vegetables and regular bouts of exercise of only 15 minute duration should be stressed on entry into the maintenance phase.

This study has shown that the use of email contact with a dietitian is an effective means of providing a service that can be easily introduced into NHS dietetic management, although it needs further investigation across multi-centres and over a longer time period.

**Acknowledgements**

We are grateful to Portsmouth Hospitals NHS Trust for allowing us to undertake this study on site and the patients of the Weight Loss Clinic for agreeing to take part.
Weight loss ≥5% & weight loss stopped.
N = 55 eligible
55 consented
Maintenance plans devised and questionnaires and consent completed

Randomised (n = 55)

Allocated to Intervention Group (n=27)
E-mail consent completed and contact established

Lost to follow up = 2

6 month exit interview
Completers n= 25
Females 22; Males 3

Allocated to Control Group (n=28)

Lost to follow up n= 4

6 month exit interview
Completers n = 24
Females 18; Males 6
### Table 1: Demographics for participants enrolled in a weight maintenance study

<table>
<thead>
<tr>
<th></th>
<th>Intervention Group</th>
<th>Control Group</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years) (Mean ± SD)</td>
<td>43.2 ±15.23</td>
<td>46.2 ±12.0</td>
<td>ns</td>
</tr>
<tr>
<td>Age Range (years)</td>
<td>17 - 71</td>
<td>18 - 78</td>
<td></td>
</tr>
<tr>
<td>Median Weight (Kg) on entry to the study (IQR)</td>
<td>86 (38.2)</td>
<td>91.9 (39.7)</td>
<td>ns$</td>
</tr>
<tr>
<td>Median BMI on entry to the study (, IQR)</td>
<td>33.1 (10)</td>
<td>32.7 (10)</td>
<td>ns$</td>
</tr>
<tr>
<td>Amount of weight lost (kg) prior to entry into the study</td>
<td>11.6 (7.9)</td>
<td>9.5 (8.2)</td>
<td>ns$</td>
</tr>
<tr>
<td>Median Body weight loss achieved (%) prior to entry into the study,( IQR) (Range)</td>
<td>11 (8)</td>
<td>9.5 (7)</td>
<td>ns$</td>
</tr>
</tbody>
</table>

*ns non significant parametric t-test

$ ns non significant non-parametric Mann Whitney U test

### Table 2: Weight changes on exit from the study period

<table>
<thead>
<tr>
<th></th>
<th>Intervention Group Mean (±SD)</th>
<th>Control Group Mean (±SD)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median body weight (kg) maintained after 6 months (IQR)</td>
<td>94.6 (38.5) (n=25)</td>
<td>97.1 (29.5) (n=24)</td>
<td>ns</td>
</tr>
<tr>
<td>Median amount of weight loss (kg) maintained at 6 months (IQR)</td>
<td>9.6 (10.9) (n=25)</td>
<td>7.8 (5.9) (n=24)</td>
<td>0.12</td>
</tr>
<tr>
<td>Mean % weight loss maintained at 6 months (±SD)</td>
<td>10.16 (±5.4) (n=25)</td>
<td>7.3 (±4.2) (n=24)</td>
<td>0.05*</td>
</tr>
</tbody>
</table>

*data normally distributed. t-test performed.
Table 3. Change over time in perceived effort in the intervention and control groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Effort rating</th>
<th>Median value</th>
<th>IQR</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>Entry diet effort</td>
<td>1</td>
<td>2</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>Exit diet effort</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td>Entry exercise effort</td>
<td>1</td>
<td>1</td>
<td>0.028*</td>
</tr>
<tr>
<td></td>
<td>Exit exercise effort</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td>Entry maintenance effort</td>
<td>1</td>
<td>3</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>Exit maintenance effort</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>Entry diet effort</td>
<td>1</td>
<td>2</td>
<td>0.008**</td>
</tr>
<tr>
<td></td>
<td>Exit diet effort</td>
<td>-1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>Entry exercise effort</td>
<td>0.5</td>
<td>3</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>Exit exercise effort</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>Entry maintenance effort</td>
<td>0.0</td>
<td>2</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>Exit maintenance effort</td>
<td>0.0</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

*Significant level  **Significant p < 0.01
Figure 2. Relationship between amount of fruit and vegetables consumed at the end of the study period and weight change during that period

Group

\[ r = -0.352; \ p = 0.007 \]
Figure 3. Relationship between episodes of exercise at the end of the study period and weight change during that period.
Figure 4. Relationship between adherence to dietary targets at the end of the study period and weight change during that period

Key: Not keeping to targets scored = 0; Keeping to some targets = 1;
Keeping to all targets = 2; Reporting low mood = 3; Physical illness = 4
References


Overview of knowledge, research and practice

The Doctorate of Clinical Practice is divided into 4 distinct developmental elements which lead an accumulation of knowledge culminating in the submission of a thesis. The Doctorate programme develops the individual from year one where the taught elements of the course provide grounding in research methods, communities of practice, ethical consideration, leadership and political awareness ending in an assessment through policy analysis. Year 2 concentrates on developing the research question by providing a service development project which sets the scene for a submission in year 3 of the research proposal. In year 4, an analysis of the research results, development of writing skills to produce the thesis and the research paper, culminating in a viva voce to discuss the knowledge achieved. Figure 1 shows this graphically.

Taught Elements of the Course:

Over a ten month period six modules were studied. The emphasis of many of the modules (Communities of Practice; Power, Politics and Policy; Professional Ethics in a Risk Society) was centred on the development of critical thinking and theoretical basis for practice. After many years of no formal research I had not thought about research methodology and different paradigms. However, a session by Dr Helen Allan discussing qualitative research made me understand that I was definitely a positivist and that my research design was going to have to be quantitative, as I felt more confident in the experimental design and being objective about the process.
Policy, Politics and Power

I had been a school governor for seven years at the beginning of the Doctoral programme, and had held the post as chair of the governing body for 6 of those years. I knew a lot about education legislation; however I was relatively politically naive in respect of National Health Service legislation and the impact on the work of dietitians.

Within the course of the first year the summative assessment was an analysis of a policy relevant to our area of work/research. During 2005 the government launched...
its largest public health white paper of its administration. It was a consideration of the issues concerning public health in the United Kingdom including: diet, smoking and exercise. I concentrated on the issues concerning the diet of the British public and the effect on the increasing prevalence of obesity.

I had never read a full white paper before. The analysis gave me an understanding of the barriers towards effective prevention strategies. Decades of previous legislation that had failed to tackle the rising amounts of obesity could be plotted from the analysis. It gave me time to consider the role of dietetics and the knowledge that as a profession we are small in number, our role is overlooked and not fully considered.

*Emotions, Leadership and Innovations in Organisations*

This module was led by Prof. Pam Smith and Beverley Hunt, both experienced professionals. The module was an analysis of the way individuals react with organisations and how this effects direction, progression and workforce. As a mental health practitioner I was aware of emotional responses and the need for individuals to be aware of their feelings and how this transfers to others. However sat in the seminars for emotions and leadership I began to consider whether this was being overlooked in the larger dietetic department. Two elements were significant:

Firstly the Myers Briggs Analysis: I came out as Extraverted Feeling with Introverted Sensing, (ESFJ). This confirmed me as someone who has to complete things and on time. The areas for development were so enlightening to me. A need to develop my sensing – not jumping to conclusions before fully understanding a situation. It also says I have underdeveloped my feeling in that I accept judgements of others too quickly. This was so true for me and is an area I continue to focus on changing almost 4 years after completing the analysis. This awareness was crucial in the
The timeline of the research project as I was more aware of my behaviour and trigger points to the way I interpret things.

The second event was the team building exercise. As a group we were apprehensive as to the benefit of such activity when as a group we were due to split up for the following three years of our studies. At the stage we did the interactive day we were a group of 6 having lost one member. We had great fun and could acknowledge individual skills; we worked well as a team.

This developed a strong bond between us that had proved crucial as we all split off to do our own research. All but one of us had job changes during the four years of the Doctoral programme, and we have been very supportive of each other.

These are factors that we have to consider in the larger dietetic department and by the end of my doctoral studies, when I was the manager of the service; I was in a position to develop these very personal benefits in relation to the whole dietetic team.

**Development of the Service Development Project**

As part of the emotions and leadership module we discussed the theory of change. The summative assessment was the service development project. My project: An Outpatient service to Obese Adults; developed out of the policy analysis, being aware of the political drivers within the NHS and the effect of local policy on our own department. The method for the design of the project came from reading research and being aware of service delivery.

Considering clinic design a full analysis could be made by using the change management element from the leadership module forming the basis of the project.
Change Methods

In reading various texts on change management methods I could see that techniques I used in my normal evaluation of professional development were, in fact, rooted in change management. The SWOT analysis and patients satisfaction survey that we had completed in the establishment and evaluation of the clinic for obese adults, were formative in change management. The Venn diagram shown above (Figure 2) shows the major drivers in the formation of the out patient service to obese adults and how they all combined to underpin the service development project.
Research Methodology

Year three was taken up with the completion of the research proposal. The methodology was a positivist design with qualitative additions. Having always felt myself a quantitative researcher, I began to realise that the qualitative element was illustrating additional information in the project. In discussing individuals experience of the intervention I could begin to gain a greater insight into personal experience of using email and this could shape the benefit of the study and its future.

In completion of the annual review in year 4 and quoting the publication of some research I was involved with a few years ago, I realised that that particular methodology had been qualitative.

Time Management

Within the research proposal a table of the proposed research timeline was put forward. However, this is better displayed in a Gantt chart showing the different phases of the study through to analysis and writing up against the time-line, against a submission date of the autumn of 2008

Table 1: Gantt chart of Project timeline

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<td>Exit interviews</td>
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<td>Analysis</td>
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<td>Write up</td>
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Professional Development

It is often said “that it never rains but it pours!” This could be said about the third/fourth year of the Doctoral programme. The position of the head of the dietetic department in which I work was advertised. In applying for the post, I was able to transfer the whole doctoral programme into the application and subsequent interview process. I was able to utilise elements of the policy/politics module, communities of practice, leadership and emotions and research in the interview presentation which was entitled: “Discuss a strategy for leadership that will put Portsmouth Hospitals Trust at the forefront of meeting Public Health targets relating to nutrition”. The PowerPoint presentation is in Appendix 1. From the slides shown you can see that the overall strategic influence that the Doctorate had instilled in me during the first 2.5 years had been influential. I was able to discuss not only the clinical implications for dietetic management but the larger political influences that would apply to the future work of the dietetic team.

Advancing Clinical Practice (changes in clinical practice)

One of the major public health issues for the UK and the world is the management of obesity. Dietetics remains one of the few professions in the NHS that are dealing with obesity and having to develop strategies to enable effective treatment to be delivered to large groups of people. As such the research project forming part of this thesis is centred on meeting that need.

A HTA call for proposals on weight maintenance in adults was issued in April 2008. I approached the RDSU at the hospital (including a research assistant and statistician) and they agreed that the call “Weight loss maintenance in adults with obesity” was something we should not let pass by. Despite this application coinciding with my final write up I decided to give it a shot! Discussion with others helped development of the proposal and this was given great benefit from two
recruits from the University of Surrey who were keen to complete qualitative elements of the project and direct strategy; and a clinical trials unit were also added to the research team. Within two months a ‘community of practice’ was formed. Discussions with other dietetic departments asking if they would be interested in recruitment to the study were positive. Therefore, this was developing clinical practice on many levels.

However, it was hoped that I would submit the application at the end of July in the hope that we would meet the criteria to apply for a full grant to undertake a longer research project with three trial arms. Unfortunately due to not being fully aware of the ‘unwritten rules’ of research awards I struggled to get a health economist and research ‘heavyweight’ involved. I was disappointed, but learnt a lot from the collaboration of the small team we put together. It was also rewarding to see that others thought my project idea was worthy of further study.

**Contribution made by the Thesis**

The Doctoral study has been formative on my professional style in both my role as a leader, manager and undergraduate teacher of clinical dietetics. The research project has contributed to knowledge of dietetics in weight loss maintenance. It has provided a small but important British study in the use of email to offer behavioural support to NHS patients. It has developed an extended treatment programme for dietitians. The theories of behavioural change are important in dietetic knowledge and work. This study allowed an analysis of behaviour change theories in relation to the work/education provided by a dietitian and consideration of the role as a mastery counsellor in aiding participants in the study to maintain their weight.
"Discuss a strategy for leadership that will put Portsmouth Hospitals Trust at the forefront of meeting Public Health targets relating to nutrition"

Denise Thomas

Public Health Targets

• Standards for Better Health – 7th domain:
• Programmes & services are designed and delivered in collaboration with all relevant organisations and communities to promote, protect and improve the health of the population served and reduce health inequalities between different population groups
• Nutrition specific targets: combating obesity and working within National Service Frameworks

Specific Targets

• Reduce these gaps of inequality
• Reduce by 40% the incidence of cardiovascular disease
  – Reducing salt will prevent 70,000 heart attacks
• Reduce by 6% the incidence of cancer
  – Dietary factors contribute to 30% all cancers
• Decrease by 2010 the year on year increase in the incidence of obesity in children rising 11 years.
Key issue: Improving the health of the community served

- 40% people attending hospital are malnourished (rising to 60% at 65yrs+)
- 22% adults are obese; 10% of 6 year olds and 17% of 15 year olds
- There is considerable health inequality within Portsmouth and SE Hampshire
- Poor diets cost NHS £6bn per year

The role for a dietetic service

- These targets are there because other nutritional targets are not met
- Five a Day
  - Current average consumption is 2.448g per day
- Intake of dietary fat
  - Intake fat is reduced but above 35% total E target
  - SFA is at 18% of total fat intake against <8% target
- Intake of salt
  - Intake 9–10g salt per day
  - Recommended level 6g

A leadership strategy

- Set direction
- Key stakeholders:
  - Primary Care Trusts
  - Specialist Trusts
  - Local authorities
  - Educational establishments
  - Effectively integrating workforce into NHS business planning – ISIP approach to change
Leadership strategy

- Delivering the service
  - Unique position of PHT dietetic service & nutritional resource on offer
  - Developing a cost effective service
  - Skill mix of the dietetic team
  - Ensuring collaborative working, effective and strategic influence

Leadership strategy

- Personal Qualities of the leader must ensure ability to:
  - Influence the drive for improvement
  - Ensure the quality of nutritional resource
  - Seek opportunities to share practice
  - Use audit, policy development and guidelines effectively

A continuum

Students  Support staff  Nutritionists  Dietitians

One Department: One Service
PART TWO

Clinical Practice Development

Including:
Policy Review in a Specialist Field
Service Development Project
Research Log

Faculty of Health and Medical Sciences
Division of Health and Social Care

University of Surrey

December 2008
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Policy Review in Specialist Field

Analysis of:

Department of Health

Choosing Health:

Making Healthy Choices Easier

Denise Thomas

URN 3461785

Doctorate of Clinical Practice Jan 05

September 2005

I declare that this essay is wholly my own work, except where acknowledged specifically as the published or unpublished work of others.

7,988 words minus references, tables, index and title page
Introduction

The "Choosing Health" White Paper was launched in October 2004. It is a key policy in Labour's public health strategy and a long awaited start to the government's management of the rising rates of obesity. Therefore, it is logical as the policy chosen for my analysis.

"Choosing Health" can be seen as a policy statement (Pasteur, 2001). It is a large document, having 8 chapters and two annexes in 207 pages. The eight chapters cover various public health issues:

- Sexual health,
- Reduction in smoking behaviour,
- Alcohol abuse,
- Obesity
- Healthy eating.

The chapters combine all the issues under headings of:

- Time for action,
- Health in a consumer society,
- Children and young people,
- Local communities leading for health,
- Health as a way of life,
- A health-promoting National Health Service (NHS),
- Work and health
- Making it happen – national and local delivery.

Therefore, to fully analyse the policy and its effect on obesity, the whole document needs to be read and analysed. The Executive Summary provides an excellent synopsis.
The White Paper was the product of several key events / documents. The yearly rise in statistics of the rates of over weight and obese people within the UK were concerning. In addition, several high profile media events had made alarming headlines regarding the state of the obese British nation. The social, economic and cultural elements of the problem precipitated a political response. Previously, the Government had been seen to act on smoking as a major public health issue. Tackling the rising rates of obesity appeared to be low priority. However, the reports by Derek Wanless (2004) and the House of Commons Select Committee (UK Parliament, 2004) stressed the need of various government departments to act on the 'problem'.

The elements of the policy that will be considered are; the context of the policy and how it developed, the measures in the policy and how they will influence delivery, plus the effectiveness of the measures suggested.

**Policy analysis**

Policy analysis is described as a way to evaluate the effectiveness of a method / programme (Musick, 1998). There are two main headings that formulate the policy analysis. The processes which formed the policy and the measures for implementation of the policy e.g. laws, regulation and measures that ensure the policy is put into practice.

The paper by Humes (1997) describes analysing educational policies. "Choosing Health" is a public health policy, with educational features as part of the health promotion targets; therefore the tool was selected for analysing this policy. Humes uses four headings to analyse policies, two for processes and two for measures:
### Table 1

<table>
<thead>
<tr>
<th></th>
<th>By what processes does the policy begin to be formed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>How are these processes influenced by ideology, politics, economics and cultural concerns?</td>
</tr>
<tr>
<td>3</td>
<td>Who has the most influence in the formation of the policy?</td>
</tr>
<tr>
<td>4</td>
<td>Where does the responsibility lie for success or failure of the policy?</td>
</tr>
</tbody>
</table>

However, on their own they do not address the issues regarding the solutions provided by the "Choosing Health" White Paper. Therefore, an additional question is posed and subheadings are listed under all questions to allow the analysis to meet all the elements of this policy (Table 2).
<table>
<thead>
<tr>
<th>Processes</th>
<th>By what processes does the &quot;Choosing Health&quot; policy begin to be formed?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Evidence of the situation perceived to be problematic</td>
</tr>
<tr>
<td></td>
<td>• Actors involved with situation</td>
</tr>
<tr>
<td></td>
<td>• Framed by actors</td>
</tr>
<tr>
<td></td>
<td>• Framing of the policy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Processes</th>
<th>How are these processes influenced by ideology, politics, economics and cultural concerns?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Ideology</td>
</tr>
<tr>
<td></td>
<td>• Politics</td>
</tr>
<tr>
<td></td>
<td>• Economics</td>
</tr>
<tr>
<td></td>
<td>• Cultural</td>
</tr>
<tr>
<td></td>
<td>All including actors and evidence</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Processes</th>
<th>Who has the most influence in the formation of the &quot;Choosing Health&quot; policy?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Actors with influence and the evidence for this</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measures</th>
<th>What measures have been posted as solutions?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Actors that view measures as acceptable / unacceptable</td>
</tr>
<tr>
<td></td>
<td>• Evidence for effectiveness of measures</td>
</tr>
<tr>
<td></td>
<td>• How applicable are the solutions to the initial problem</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measures</th>
<th>Where does the responsibility lie for success or failure of the policy?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Actors expected to be involved</td>
</tr>
<tr>
<td></td>
<td>• How will this be evaluated?</td>
</tr>
</tbody>
</table>

By what Processes does the choosing health policy begin to be formed?

Evidence of the Situation Perceived to be Problematic

Britain's population is becoming more overweight and obese as defined by Body Mass Index (BMI). Being obese causes adverse metabolic effects and several non-fatal but debilitating health problems.

The grades for obesity and how it is calculated are shown in Table 3 (World Health Organisation, 1973). Over the last 10 years, the rise in the number of overweight and obese people in the UK has risen dramatically (Table 4).
Table 3

<table>
<thead>
<tr>
<th>Body Mass Index</th>
<th>Weight in Kg (Height in metres)$^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td></td>
</tr>
<tr>
<td>18.5 – 25</td>
<td>Normal weight</td>
</tr>
<tr>
<td>25 – 30</td>
<td>Overweight (Obesity grade 1)</td>
</tr>
<tr>
<td>30 – 40</td>
<td>Obese (Obesity grade 2)</td>
</tr>
<tr>
<td>40+</td>
<td>Morbid Obesity (Obesity grade 3)</td>
</tr>
</tbody>
</table>

Table 4: Rates of Obesity for People with BMI > 30 (Department of Health, 2002)

<table>
<thead>
<tr>
<th>Year</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>6%</td>
<td>8%</td>
</tr>
<tr>
<td>1987</td>
<td>7%</td>
<td>12%</td>
</tr>
<tr>
<td>1991</td>
<td>12%</td>
<td>15%</td>
</tr>
<tr>
<td>1996</td>
<td>17%</td>
<td>20%</td>
</tr>
<tr>
<td>1998</td>
<td>18%</td>
<td>23%</td>
</tr>
<tr>
<td>2002</td>
<td>23%</td>
<td>25%</td>
</tr>
</tbody>
</table>

The previous government addressed the issue based on the WHO 'Health for All by the Year 2000' (World Health Organisation, 1981) and produced the 'Health of the Nation' White Paper (Dept. of Health, 1992). This set targets to decrease the prevalence of obesity to 6% in men and 8% in women by 2010; however, the targets failed miserably and the rates have continued to increase. Britain has the highest rates of childhood obesity in Europe but it is not just a UK problem. It is global and extends to the
developing world. Worldwide, 300 million adults are clinically obese, with 22 million children under-five estimated to be overweight, (World Health Organisation, 2003). Table 5 shows the rising rates of obesity in children.

**Table 5: Rates of obesity in children (Dept. of Health, 2005)**

<table>
<thead>
<tr>
<th>Age</th>
<th>Classification</th>
<th>1995</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 – 10 years</td>
<td>Overweight and Obese</td>
<td>22.7%</td>
<td>27.7%</td>
</tr>
<tr>
<td>2 – 10 years</td>
<td>Obese</td>
<td>9.9%</td>
<td>13.7%</td>
</tr>
<tr>
<td>8 – 10 years</td>
<td>Obese</td>
<td>11.2%</td>
<td>16.5%</td>
</tr>
<tr>
<td>15 year olds</td>
<td>Obese</td>
<td>17%</td>
<td>Not known</td>
</tr>
</tbody>
</table>

The cost of treating obesity in the UK has been estimated at £9.4 millions, with a further £470 millions per year for the effects of obesity. The total estimated cost of obesity is £3.3-3.7 billions (including lost working time, etc) (National Audit Office, 2001).

The national food survey (Ministry of Agriculture, Fisheries and Food, 1998) reported that the UK diet is still high in fat. In addition, the UK population is becoming more sedentary. These factors support statistics showing that adults are becoming increasingly overweight.

**Actors Involved with situation**

**Media**

The Kings Fund (2004) noted an increase in obesity-related stories in the national newspapers; from fewer than 50 stories in 1999, to 220 by 2003.

In 2002, the Observer cited diagnoses of type 2 diabetes (generally seen in middle aged people) in eight young patients due to their obesity.
In April 2004, the death of a three year old girl due to obesity initiated a significant amount of national media interest. Many television programmes were commissioned to assuage the thirst for weight loss information, including Celebrity Fit Club (ITV), Diet Trails and Fat Nation (both BBC).

**Statutory bodies**

Various documents supported the view that obesity rates were escalating and that the Government needed to act. "Saving Lives: Our Healthier Nation" (Dept. of Health, 1999) discussed targeting coronary heart disease and cancer, both being significant risk factors of obesity, yet no specific objectives or targets were set for tackling obesity. Similarly, the NHS Plan (Dept. of Health, 2000) reflects priorities for disease prevention and reducing health inequalities, without mention of obesity.


- **Wanless Report (2004)**
  
  Derek Wanless was commissioned by the Labour government to examine future health trends and factors determining the long term financial and resource needs of the NHS to 2022. The document illustrates that previous governments had failed to tackle the obesity problem. The 'Health of the Nation' (Dept. of Health, 1995) targets were ineffective, as no governmental support existed to help and encourage any intervention likely to influence the targets, although the document met the ideology of the Conservative Government, at the time,
Wanless (2004) supported the view that the NHS should shift its focus from a national sickness service, which treats disease, to a national health service, which focuses on preventing it.

Wanless and his team consulted various bodies (200 in total) including NHS Trusts, Local Authorities (LAs), Royal colleges and academia, as well as business, industry and patient groups. They asked 10 questions, including what is best practice in public health policy; the most cost effective way of managing disease; improving the health of the population; and the barriers to the health of the population in 2022.

The recommendations focus on a clear national framework of objectives for tackling obesity and the report produced 21 specific recommendations for the Government.


The Health Select Committee, comprising Members of Parliament from different political parties, met with individuals involved in prevention and treatment of obesity; focusing on health practitioners, obese people and service providers (including the commercial sector). The Committee recommended an integrated, wide ranging programme of solutions, to be adopted as a matter of urgency and was critical of previous attempts to target the rise in obesity. The members recommended a consistent, effective strategy, rather than an overnight result, and strongly endorsed the Wanless Report (Wanless) with the recommendation that the Government must clearly assign responsibility for a health education role, with a focus on treatment and prevention.
The Committee criticises the Government’s national service frameworks (NSF) which, in 2004, had included coronary heart disease and diabetes but not obesity.

The chronological pathway through government Reports to ‘Choosing Health’ is shown in Appendix 1.

- Health Professionals

Before 1995, few professional bodies had sub-groups interested in obesity. Nationally, there was the Association for the Study of Obesity; however, from 1997 various ‘new’ organisations were formed, supporting health professionals interested in obesity management (Table 6). These health professionals became major actors in the development of the HSC Report (UK Parliament, 2004).

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Date of Formation</th>
<th>Health Professionals</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Obesity Forum</td>
<td>May 2000</td>
<td>Any health professionals</td>
</tr>
<tr>
<td>Dietitians in Obesity Management</td>
<td>2001</td>
<td>Registered Dietitians</td>
</tr>
<tr>
<td>TOAST (The Obesity Awareness and Solutions Trust)</td>
<td>1998</td>
<td>Any health professionals &amp; interested parties</td>
</tr>
<tr>
<td>Weight concern</td>
<td>1997</td>
<td>Any health professionals &amp; interested parties</td>
</tr>
</tbody>
</table>

Framed by Actors

By 2004, the Government was under no illusion that the number of obese people in the U.K. was rising. Since the start of their administration in 1997,
the rates of obesity had increased by 6%, with over half the population being overweight and obese (BMI >25). This had significant implications for the future of the NHS and the economy. Table 7 shows the government departments, outside the Department of Health (DoH), and the issues that had a causal or remedial effect on the increasing rates of obesity.

School meals were a significant issue. The Conservative ideology avoids central control, so school meals were under competitive tendering resulting in a ‘take away’ type mid-day meal, rather than a ‘meat and two veg with dessert’ meal. The issue of school meals was taken up by the celebrity chef Jamie Oliver who, at the time of the final draft of the White Paper, conducted an experiment on changing school meals at a school in Greenwich. It produced interesting television but, more importantly, it raised a political ‘hot potato’ regarding the nutrition of the nation’s young. The effect of the Jamie Oliver programme can be seen within the White Paper and the Labour Party manifesto (2005).
Table 7

<table>
<thead>
<tr>
<th>Government Department</th>
<th>Initiatives to help prevent Obesity</th>
<th>Initiatives working against prevention of Obesity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education and Skills</td>
<td>• Healthy Schools Award</td>
<td>• Sale of School Playing Fields</td>
</tr>
<tr>
<td></td>
<td>• School meal standards</td>
<td>• Cookery becoming Food Technology</td>
</tr>
<tr>
<td>Culture, media and Sport</td>
<td>• Sport England</td>
<td>• No legislation on advertising to children</td>
</tr>
<tr>
<td>Agriculture</td>
<td></td>
<td>• Common agriculture Policy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>– which influences the sourcing of fresh produce</td>
</tr>
<tr>
<td>Work, Pensions &amp; Trade and Industry</td>
<td>• Working Time directive – to ensure more leisure time</td>
<td></td>
</tr>
</tbody>
</table>

Framing of the Policy

The first chapter of the White Paper establishes the 'drivers' for the policy: a growing public interest in health; television programmes; news headlines; the Wanless Report (2004); and the Health Select Committee's Report (UK Parliament, 2004).

In addition to these drivers, a comprehensive consultation process was undertaken, involving over 150,000 people in local discussions and surveys. They were asked 'What the government should do? What individuals should do for them? What support would they like from the
NHS, local government? What they need from food and leisure industries and what they would like for their children? In addition, a further 200 people with specific expertise were consulted and an Opinion Leader Research (OLR) survey was undertaken to assess people's attitudes to health policy.

*How are these processes influenced by ideology, politics, economics and cultural concerns?*

**Ideology**

The 'Health of the Nation' policy (Dept. of Health, 1992) had set definite targets to reduce the number of overweight and obese people. The John Major administration was founded on the right wing beliefs of Conservatives; a free market and no state control. The targets were a useful rallying point but there was no encouragement to develop local targets based on local need.

New Labour believes in a health service that is 'free at the point of delivery' (Labour Party, 2005). Early on in the policy, the government states that 'it is committed to better health for everyone' and that 'investment in the NHS is at record levels' (Dept. of Health, 2004a). New Labour ideology sees health as being an individual responsibility, with state services supporting health change. This is the focus of the whole paper: it sets out action to make healthier choices by providing better information, encouragement, help, support and services. Unlike the Conservative approach, Labour seeks to provide some support from government. Whereas individuals clearly have responsibility for their own health, they expect the government to help by creating the right environment.
The "Choosing Health" policy is based on three principles supported by the ideology of the Labour party:

- Supporting informed choice: helping the individual to make suitable changes to benefit their health.

- Personalisation of support to make healthy choices: building information, support and services around people's lives and providing equal access to reduce health inequalities. This is underpinned by the left of centre ideology of the labour government, equality of opportunity and safeguarded by state provision.

- Making health everyone's business: health needs are complex and do not fit into the boundaries of individual organisations or government departments. Individuals, communities, voluntary and public bodies, employers and media all have a role.

The White Paper consultation asked what would make a difference to enable people to choose health, again supporting party ideology.

The New Labour ideology and style in delivery is seen throughout the policy. It is written in an easy-to-read format, with a bullet-pointed summary at the beginning of each chapter, highlighting key points. Action points are put in bold type. The language used helps in understanding i.e.; stretched for money – poor; out of work – unemployed. They also use case studies to describe the scope of the problem and examples of good practice – although none of these examples have been evaluated.

Politics

The Conservative Government had been in power for 16 years, during which the rates of obesity had increased (see Table 4). However, the rates of obese people in Britain continued to increase, presenting the Blair
Government with significant political issues. The NHS was described by Wanless (2004) as a National Illness Service. Costs of obesity-related illness continued to increase and previous ‘targets’ set to reduce obesity had not worked. The cost of obesity-related illness was putting the NHS under pressure.

The media picture of a ‘fat nation’ was disturbing the Labour Government at the beginning of their second term of office; a government that was underpinned by an ideology that it should safeguard the individual was clearly failing. In 2002, the Government needed to focus on implementing “Securing Our Future Health: Taking a Long Term View” (Wanless, 2002), which concentrated on catching-up, following the Tory administration. Having tackled the main issue for the public (waiting times), ill health focussing on smoking and obesity took main stage. The Government put its focus on smoking. Dr John Reid, Secretary of State for Health (2002 - 5) heralded the smoking cessation service. This model proved to be popular and effective. However, the media push to highlight the rates of obese people began to influence the Government in 2003. The press reports and the bad publicity for various food manufacturers, e.g. Walkers Crisps “Tokens in exchange for school books”, Cadbury/Schweppes “tokens for sports equipment” etc., brought obesity to the top of the news headlines. No longer could Labour Ignore the comments, so Derek Wanless was commissioned to devise a cost-effective approach to improving population health and preventing illness. Simultaneously, the Health Select Committee undertook a specific investigation into treatment and prevention of obesity.

The role of successive governments in preventing ill-health had been a top down approach since 1948. Public health was viewed as something that
was 'done' to you. The solutions provided by the White Paper reflect the political influence of taking conflicting issues for the government (i.e. financial constraints against service provision) and providing a comprehensive strategy, which has individual choice as its focus.

However, the Government also recognises that portrayal of healthy lifestyles can seem preachy, boring and too much like hard work (Dept. of Health, 2004b). This is a reflection of the degree of consultation that the Government have made in their development of policies.

**Economics**

The National Audit Office (2001) produced the first official assessment of the human and economic cost of the national weight problem. Obesity caused more than 30,000 premature deaths in 1998 and cost £2.6 billions in NHS bills and Indirect losses to the economy. At least 18 million sick days a year can be attributed to obesity and the increased risk of heart disease, diabetes, colon cancer and stroke reduces life expectancy by around nine years.

Without action, the rise in rates of obesity could be costing the economy more than £3.5 billions by 2010. Currently, treating obesity and associated illnesses costs the NHS £500 millions in consultations, drugs and other therapies. The Indirect cost, such as loss of output in the economy due to sickness or early death of workers, was put at £2.1 billions.

The increased rates of obese children caused anxiety amongst many. It was suggested that the numbers of children developing obesity and obesity-related co-morbidities would increase the death rate in young adults.
Wanless (2004a) states that "where changes in lifestyle have a potential impact across more than one disease (as in obesity), this should be taken into account when assessing cost-effectiveness". The report suggests that government should conduct a cost-benefit analysis to determine whether the cost of providing the service is less than the associated benefits. Current and historic governmental reluctance to tackle obesity could be assessed economically. The numbers of obese people are significant; therefore any strategy to tackle the problem will be costly.

Cultural

The OLR in "Choosing Health" showed that there are large socio-demographic differences in health experiences. One third of people living in lower socio-economic groups consider themselves to be in poor health. Historically, obesity was associated with affluence and within developing countries, such as India, Africa and South America, obesity is still a particular problem amongst the recently affluent classes, where being overweight is seen as a sign of prosperity (World Health Organisation, 2003). However, in developed countries there is an inverse relationship between obesity and social class, with a much greater proportion of obese people in the lower social classes than in professional groups. In the UK, the prevalence of serious obesity in women increases from 15.6% in social class I to 27.6% in social class V (Dept. of Health, 2002). Although a similar trend is observed in men, the social divide is not as significant (20.2% vs. 21.0%). The Health Survey for England (Dept of Health, 2005) report identifies the highest prevalence of childhood obesity in the most deprived areas of the UK.
Within the White Paper, the Government acknowledges the need to work in ways that will take account of the realities of people's lives, particularly those that are disadvantaged. Success is critical in tackling health inequalities. The Government states that 'Government should respond to inequalities through policy design and implementation'. HM Treasury report (2002) recognises that to address health inequalities there must be co-delivery of services between NHS, business and voluntary groups. This will be a key area for the “Choosing Health” policy; however tackling this in conjunction with informed choice will be difficult.

Who has the most influence in the formation of the “Choosing Health” policy?

Actors with influence and the evidence for this

Keeley and Scoones (1999) describe policy making in various characteristics. These have been listed in Table 8 to show how the actors and processes in the development of the “Choosing Health” Policy became influential its final development.
Table 8

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>What does that mean for “Choosing Health”?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incremental and Complex</td>
<td>- Learnt from the mistakes of Health of the Nation</td>
</tr>
<tr>
<td></td>
<td>- Change in the ideology of the government</td>
</tr>
<tr>
<td></td>
<td>- Increasing numbers of overweight and obese adults and children since the advent of a labour government</td>
</tr>
<tr>
<td>Shaped by Policy narratives</td>
<td>- Increasing media interest, sensational headlines</td>
</tr>
<tr>
<td></td>
<td>- Pressure on health economics</td>
</tr>
<tr>
<td>Pluralist</td>
<td>- Media</td>
</tr>
<tr>
<td></td>
<td>- Health professionals and organisations</td>
</tr>
<tr>
<td></td>
<td>- Obese people</td>
</tr>
<tr>
<td>Informed by Actor networks</td>
<td>- Consultation of Derek Wanless reports</td>
</tr>
<tr>
<td></td>
<td>- Representations to the Health Select Committee on obesity</td>
</tr>
<tr>
<td></td>
<td>- Evaluation of Health of the Nation</td>
</tr>
<tr>
<td></td>
<td>- Media produced topical television programmes inc. Fat Nation, Jamie’s Dinners etc.</td>
</tr>
<tr>
<td>Political</td>
<td>- Overweight and Obese people make up 60% adult voting population</td>
</tr>
<tr>
<td></td>
<td>- Impact of obesity on economics of the country</td>
</tr>
<tr>
<td></td>
<td>- Anti-smoking legislation had tackled the tobacco industry. Next target the food industry for obesity</td>
</tr>
<tr>
<td>Influenced by Practice</td>
<td>- The policy shaped by examples of good practice</td>
</tr>
<tr>
<td></td>
<td>- Influence of Health Select Committee including professional actors</td>
</tr>
</tbody>
</table>
Who has the most influence? Without doubt it must be the numbers of obese and overweight (BMI >25) people, constituting 60% of the current adult population. This has significant implications for the country as a whole. Although recognising that people do not wish the government to be a nanny state, the message from the majority of overweight and obese people is to receive help and advice that works.

Without the media, the voice of obese people would not have been heard. Sensational headlines, such as, "One million children so fat they have diseases of middle age", "Obesity epidemic will spread to 3 out of 4 men by 2010" (Daily Telegraph, 2005), have ensured that the topic of obesity has been kept in the spotlight.

The influence of the Health Select committee (UK Parliament, 2004) and Wanless (2004) Reports was also significant.

What measures have been posted as solutions?

As mentioned earlier, the 'Choosing Health' policy has many recommendations. Table 9 summarises those that directly affect the nutritional component of the obesity problem, solutions are then fully discussed below.

The policy makes comment on physical activity, which is vital to any obesity prevention strategy; however, for the purpose of this review, the discussion is limited to food choices only. Key actions of the policy are: regulation, resourcing delivery, joining up action, aligning planning and performance, building partnerships and inviting engagement.
Table 9: Measures and Solutions Posted

<table>
<thead>
<tr>
<th>Measure</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Five-a-day</td>
<td>Quoted as a success&lt;br&gt;Build on success and techniques used to include smoking, salt, sexual health, obesity and physical activity</td>
</tr>
<tr>
<td>Food Labelling</td>
<td>By 2005 there will be a standard basis for signposting foods&lt;br&gt;By 2006 a clear straightforward coding system will be in common use</td>
</tr>
<tr>
<td>Food Advertising</td>
<td>Restriction of advertising and promotion of food &amp; drinks high in fat, salt and sugar.&lt;br&gt;OFCOM to tighten rules on advertising&lt;br&gt;Assessment by 2007; if failure to produce change, then new legislation will be implemented</td>
</tr>
<tr>
<td>Food in Schools</td>
<td>Healthy schools will be in all schools by 2009&lt;br&gt;Standards will be imposed in schools regarding food inc. school meals, vending machines, tuck shops&lt;br&gt;OFSTED will inspect food standards in school&lt;br&gt;Food in schools kit to be available by summer 2005</td>
</tr>
<tr>
<td>Care Pathway</td>
<td>National Institute for Clinical Excellence (NICE) – definitive guidance on prevention identification, management and treatment by 2007&lt;br&gt;Weight loss guide will be produced&lt;br&gt;New research will be commissioned for gaps in knowledge base&lt;br&gt;There will be a National Partnership for Obesity&lt;br&gt;Each PCT should have access to specialist obesity service and to a dietitian.&lt;br&gt;More funding will be available in 2006 to strengthen PCT capacity&lt;br&gt;Independent sector has a key role to play</td>
</tr>
</tbody>
</table>

Five-a-day

Five a day was launched in 2003 and is the campaign to encourage the British population to consume five fruits and vegetables per day.
Within the “Choosing Health” policy, the government focuses on the success of the Five-a-day message, recognising that the information and advice has been put through many routes including TV, radio, booklets, advertisements etc. The awareness of the message is reported to have increased, with 52% knowing the message in Oct 2002 and 59% knowing the message in October 2003 (6 months after the campaign was launched) (Dept. of Health, 2004c). The Government wishes to build on this success by using these routes for smoking, salt and sexual health. This will then be extended to include obesity and physical activity.

The policy states that the Dept. of Health will work with media, consumer groups and health professionals to develop a clear set of messages on healthy eating. These messages will be promoted through a new cross-government obesity education campaign. This clearly addresses the key actions of ‘joined up action and aligning partnerships’.

**Actors View of the Measures**

The Health Select Committee was negative about the benefits of the Five-a-day message in tackling obesity. “Although we acknowledge its benefits, we do not accept the Government’s view that the Five-a-day fruit and vegetable promotion campaign is either designed for, or capable of, addressing the nutritional aspects of obesity” (UK Parliament, 2004a). However, the Government plan to use the mechanism of the Five-a-day message for other health messages.

**Evidence for the Effectiveness of the Measure**

If the Government feels confident about the communication of the Five-a-day message, why do obesity and physical activity come after smoking and salt? The answer may lie in the failure of the message regarding fruit and
vegetable consumption to translate into consumption. The policy states that consumption of five fruits and vegetables per day has increased by 5.8% in 2001-2 to 2002-3. The Family Food report (DEFRA, 2005), shows that fruit and vegetable purchases are 1.6% lower in 2003/4, suggesting that the public are eating less fruits and vegetables. So, although people understand the message, translating knowledge into action is proving difficult – which does not bode well for the translation of the risks of obesity translating into action.

A study into advertising costs (Mintel, 2001) revealed that less than 2% of the amount of money spent advertising chocolate, sweets, crisps and snacks (£178.2 millions in 2002) was devoted to advertising fruit (£2.8 million). Meanwhile, the £5 millions annual budget of the Government's Five-a-day campaign is overwhelmed by the advertising budgets of large food companies.

**How Applicable are the solutions to the actual problem**

From the evidence supplied to the Health Select Committee, the ability of Five-a-day to tackle obesity is poor. The message is not being translated into action and, in the 2 years that the campaign has been in operation, the numbers of obese people are still rising. The policy of providing fruit and vegetables to each child under 7 years old, introduced in 2004, is proving popular with teachers and pupils in infant education, however the rates of obesity in this age group continue to rise. By the end of 2004, all 4–6 year olds in state schools received a daily piece of fruit or vegetable to eat at break time. The impact of this has yet to be seen. A National Opinion Poll survey (National Opinion Poll, 2003) has shown that the scheme has benefited the family, with 255 parents reporting that their families ate more
fruit at home and had been more aware of the positive effects of fruit in a healthy diet. The effect is most positive in lower socio-economic groups however, “Choosing Health” extends this strategy to nurseries but not to junior schools (age 7–11yrs).

Food Labelling

British presidency of the EU, from July 1st 2005, is seen as a good opportunity to influence the Common Agriculture Policy (UK Parliament, 2004b) and the push for better/simplified labelling. This is an example of the ‘joined up action’ seen in the policy as one of the key areas for the government.

By mid 2005, the policy dictates that a system will be introduced as a standard basis for signposting foods and proposes that, by 2006, there will be a clear straightforward coding system in common use. This will be a nutrient profile model on high-medium-low descriptors of salt, fat and sugar levels.

Actors view of the measures

The HSC Report (UK Parliament, 2004c) states “The Government must accept the clear fact that some foods, which are extremely energy-dense, should only be eaten in moderation by most people, and we therefore recommend that it introduces legislation to effect a ‘traffic light’ system for labelling foods, either ‘red—high’, ‘amber—medium’ or ‘green—low’ according to criteria devised by the Food Standards Agency (FSA), which should be based on energy density. This would apply to all foods.”

The British Dietetic Association (BDA, 2004) welcomes the clear labelling of foods, provided that the system developed supports people in making healthy choices rather than causing confusion. The Association also states
that the 'traffic light system' suggested by the Health Select Committee is a small step and it should be part of a long term multi-agency approach.

**Evidence for the effectiveness of the Measure**

The Five-a-day logo shown below (Fig 1) is a well-recognised image to identify the message of increased fruit and vegetable consumption. However, the consumption is not increasing. Therefore, the traffic light system might also result in no change in food selection.

![Figure 1: Five-a-day Logo.](image)

The Food Standards Agency (2004) looked at five signposting concepts and it is hoped that testing completed by the FSA will be reported on by summer 2005. To date (September 2005), they have not reported and a recent telephone call to the FSA revealed that they are still consulting on the trials of various systems.

The policy recognises the difficulties in the system and has ensured that evaluation of any system might be conducted up to one year after introduction.

**How Applicable is the Solution to the Initial Problem**

No single action will solve the multi-factorial problem of obesity. However, a system that would allow individuals to understand the energy content of food would help in food selection. However, the dietary message is complex and a food labelling system needs to accommodate nutrient versus energy density issues. Helping the public understand which nutritional components of salt, fat and sugars are the issue will be
challenging. The Government states several times in the policy that it hopes to ensure consistent messages about choosing a healthy diet. For this reason, clear, consistent guidelines on food labelling are important.

Unlike Scottish policy, ‘Choosing Health’ fails to commit to nutrient standards, in terms of what should be available in shops, vending machines etc. Similarly, the action suggested on nutrition labelling has no substantiation. Waiting for evidence is not an option; therefore, evaluation of strategies and their feasibility should inform action.

**Food Advertising**

The Office of Communications (OFCOM, 2004) reported that children watch 17 hours of television per week and younger children see more advertisements for food products than older children. However, 71% of the viewing time of children (6 – 11 year olds) is in adult time. Therefore, legislation to control food advertising must focus on the total viewing time.

The Government proposes that there is a strong case to restrict advertising and promotion of food and drinks high in fat, salt and sugar, expecting OFCOM to consult on a proposal to tighten the rules on broadcast advertising, sponsorship and promotion of food and drink.

The policy indicates that if there is no change in the nature and balance of food promotion by 2007, the Government will take action through existing or new legislation to implement a clearly defined framework for regulating the promotion of food to children. Action needs to be comprehensive, covering broadcasting, non-broadcasting, point of sale advertising, brand-sharing and sponsorship.
Actors view of the Measures

During the consultation on the "Choosing Health" policy, many of the respondents called for an outright ban on food advertising during children's viewing time. Others called for restrictions during peak viewing.

The HSC Report raises the issue of food advertising (UK Parliament, 2004d) "We were appalled that a £710,000 campaign, launched by one of Britain's largest snack manufacturers, deliberately deployed a tactic which explicitly sought to undermine parental control over children's nutrition. The fact that this campaign was approved by the Advertising Standards Authority does not exonerate it, but merely demonstrates the ineffectiveness of current ASA standards and procedures."

The FSA study (Hastings et al, 2003) found that children's food promotion is dominated by television advertising. Hastings felt strongly that food advertising is having an effect on food preferences, purchases and consumption. An OFCOM report (2004) concluded that a total ban on advertising of food and drinks to children would neither be 'proportionate nor, in isolation, effective'. OFCOM therefore recommends a tightening of the rules on television advertising as described in the "Choosing Health" policy.

Evidence for the effectiveness of the Measures

Children under 8 years of age are developmentally unable to understand the intent of advertisements and accept advertising claims as factual. The intense marketing of high fat, high sugar foods to young children can be viewed as exploitation; as the purpose of advertising is to persuade, and young children have few defences against such advertising. Older children
and teens can be manipulated by the strong emotive messages in advertisements (Strasberger, 2001)

Other countries have banned aspects of television advertising to children. However, research into the effects of this is limited. Where research has been undertaken, the findings are both unclear and contested. In Sweden and Norway, there has been a complete ban since 1991 on advertising to children, yet there has been no difference to the rates of overweight and obese children. (OFCOM, 2004)

How Applicable are the Measures

As most food advertising takes place outside of children's viewing there would seem few benefits to legislation on children's TV advertising on obesity. However, the consultation process for 'Choosing Health' has shown that the public feel strongly about food advertising and want some degree of legislation. The Government's proposal, to look at point of sale advertising, sponsorship and non broadcast material, aims to remove those promotions that have directly acted against health targets e.g. Walkers crisps 'Tokens for books' campaign and Cadbury/Schweppes 'Tokens for sports equipment'.

Food In Schools

The Healthy Schools Initiative continues to be the flagship of the Government's health promotion in schools. The policy states that half of all schools will be healthy schools by 2006, with the remainder achieving it by 2009 (Dept. of Health, 2004d)

The impact of the Jamie Oliver campaign to improve school lunches is seen in the White Paper. Investment is proposed over three years to improve nutrition in school meals by revising school meal standards in
primary and secondary schools. There will be legislation to extend the standards to cover all food across the school day including vending machines, tuck shops etc. The provision of locally sourced food will also be encouraged. To assess this, OFSTED inspectors will look at healthy eating in schools and assess school meals provided within the day. A ‘food in schools’ package, to support a whole school approach to healthy eating and drinking, will be available from 2005.

**Actors view of the measures**

The HSC Report (UK Parliament, 2004e) suggests that “the Government takes steps to reformulate the Food Technology curriculum, so that children of all ages receive practical training in how to choose and prepare healthy food which they can put into practice in their daily lives, how to understand food labelling and how to distinguish food advertising and marketing from objective fact”.

However, the ‘Choosing Health’ policy does not support changes to the Food Technology curriculum. The Government has listened to the committee, with respect to vending machines, tuck shops and involving school governors.

The BDA (2004) supports the view that the curriculum should not include only the theoretical benefits of a healthy diet but also practical cooking skills and budgeting sessions, stating that financial assistance should be given to schools to provide unbiased, unambiguous messages about a balanced diet. The revision of standards and introduction of nutrient based standards for school meals was welcomed.
Evidence for the effectiveness of measures

Increased responsibility for OFSTED inspectors conflicts with the new, short inspection. Previously, inspections could last 4–5 days. A secondary school can now be inspected over 1–2 days, therefore the inspection team's ability and time to assess nutrition policies and adequacy of school meals is debatable. Also, the inspectors will require training and support to assess and comment on food policy in schools. They are to start inspecting school food by September 2005.

In the food and health action plan "Choosing a better diet", which came from the White Paper, the Dept. of Health (2005a) states that there are already many opportunities throughout the national curriculum to teach healthy eating principles e.g. food technology, personal, social and health education (PHSE), science and design technology. However, none of these subjects have tackled the issue with effect so far. Therefore, it seems lame to quote them as good practice when the impact on a poor diet and raising rates of obesity continue.

There are 9 factors within the healthy schools plan. Therefore, the schools that are working towards, or which have completed, the standard may not have chosen healthy food as a target. The Government states that it will be changing the healthy schools definition to ensure that it focuses on food and physical activity particularly in areas of low socio-economic status.

The White Paper lists many targets; few have been reached at the time of writing this analysis. However, the Government launched a 'Food in Schools' package with guidance and resources by May 2005.
How applicable are the solutions

The ‘Food in Schools’ package is comprehensive and implements a whole school approach to healthy eating and drinking. Therefore, all food and drink taken on school premises is covered, including breakfast clubs, tuck shops, vending machines, water provision, school meals etc.

A child could eat anything from one to three meals a day in the school environment. If a child eats fried potato every school day, the impact on the child's nutrition and health is obvious.

The solutions posted for schools are extensive, with as many covering food in schools as there are covering physical activity. Yet the examples of practice in the policy document are all activity based, which tends to reflect the difficulties of achieving food-based changes.

Care Pathway for Obesity

The ‘Choosing Health’ policy identifies poor clinical services for obesity, with inadequate skills to deal with obese people and a paucity of clear referral mechanisms and services.

The Government has commissioned NICE to provide definitive guidance on prevention, identification, management and treatment of obesity listed to be ready by 2006, now known to be 2007.

In addition, there will development of a comprehensive care pathway for obesity, providing a model for prevention and treatment. A weight loss guide will be produced to help people lose and maintain weight, using healthy approaches. These targets should be delivered by the summer of 2005. Research will produce new approaches to fill gaps in the evidence
base and there will be support for a National Partnership for Obesity, promoting practical action on prevention and management of obesity.

The numbers of overweight and obese people mean that Primary Care Trusts (PCTs) will need specialist obesity services, with access to a dietitian and relevant advice on behaviour change. From 2006, there will be additional funding to strengthen primary care capacity for tackling obesity and development of a care pathway. 'Choosing Health' states that each PCT in the country should have access to a specialist obesity service. The HSC Report states that there are few clinics treating adults and children (UK Parliament, 2004f). Therefore, commissioning of these 'new' services will have major implications for the interface between primary and secondary care funding. One of the solutions to this is involvement of the commercial agencies. The Government recognises that the independent sector has a key role in providing effective services.

**Actors that view measures as acceptable/unacceptable**

The Health Select Committee (UK Parliament, 2004) and Wanless (2004) Reports emphasize that PCTs should safeguard the public health of the communities they serve. Both reports recommend that PCTs and Strategic Health Authorities should be assessed in their performance for public health. Professionals have stressed the need for multi-agency work to assist in targeting obesity, recognising the need to involve specialist roles and commercial weight loss agencies.

The NHS Confederation (2005) supports the action on obesity in the White Paper, commenting that the key issue is how PCTs will map out their programme to implement the targets.
Evidence for effectiveness of measures

The obesity care pathway is a target of the white Paper. A care pathway coming from primary care leading through secondary care to tertiary care is a model tested by the Counterweight team (2004) and has been evaluated as effective.

The policy also suggests the provision of a specialist weight management service with access to a dietitian which is tested within the Counterweight model.

How applicable are the measures

There is a distinct lack of evidence with respect to treatments for obesity (Anderson, 2005). In terms of obesity prevention and management, the school setting remains an obvious area for action but the proof for what works is weak.

The policy states there will be co-ordinated activity on obesity prevention and management, using a range of appropriately trained staff including health visitors, school nurses, exercise specialists, practice nurses and health trainers. The latter are a new breed of professional, described in the White Paper as having received tailored training to help people to make effective change to improve obesity, smoking or alcohol behaviours. Again, to date these are not in place and the training is still being designed.

The measures are based on local partnerships and alliances. The Health of the Nation review shows that the previous targets on obesity failed in their ability to network and provide local, needs-based programmes (Dept. of Health, 1999a). The ‘obesity treatment based in primary care’ target provides support to practitioners who were notably not involved in the Health of the Nation targets.
Where does the responsibility lie for the success or failure of the policy?

A lctors expected to be involved

Table 9 shows the government departments having initiatives that worked for and against the development of obesity prior to the White Paper. Following the issue of "Choosing Health" these government departments are involved, yet their roles are increased. Table 10 shows how their roles have increased.

Figure 2 shows how government departments, agencies and health services link to target obesity.
<table>
<thead>
<tr>
<th>Government Department</th>
<th>Initiatives to help prevent Obesity</th>
<th>Initiatives working to help tackle obesity from White Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Education and Skills</strong></td>
<td>Healthy Schools Award, School meal standards</td>
<td>School meal standards, Food in Schools, Training qualification for school caterers, Guidance on food procurement, Ofsted to inspect school food, School Food Trust, New definition of Healthy schools, Travel plans (see below), PE sports clubs</td>
</tr>
<tr>
<td><strong>Culture, Media and Sport</strong></td>
<td>Sport England</td>
<td>OFCOM to enforce tighter broadcast rules, Local exercise action plans, PE sports clubs</td>
</tr>
<tr>
<td><strong>Agriculture</strong></td>
<td></td>
<td>Common agriculture Policy – which influences the sourcing of fresh produce. Making revision of the CAP a target of the EU presidency July 2005</td>
</tr>
<tr>
<td><strong>Environment, Transport &amp; regional affairs</strong></td>
<td>Report on walking towns 2001.</td>
<td>All schools to have active travel plans, Sustainable travel towns</td>
</tr>
<tr>
<td><strong>Work, Pensions &amp; Trade and Industry</strong></td>
<td>Working Time directive – to ensure more leisure time</td>
<td>Promotion of the work environment as a source of better health</td>
</tr>
<tr>
<td><strong>Local government</strong></td>
<td>Partnership with NHS</td>
<td>National strategic Partnership Forum, Local Area agreements</td>
</tr>
</tbody>
</table>
Figure 2 Government Departments, Agencies and Health Services

Link to Obesity

Three departments share a joint target to halt the year on year rise in obesity, in those aged 11 and under, by year 2010; (Department of Health; Department Education and Skills; Department of Media, Culture and Sport.) currently those aged 6. As so many solutions in the White Paper focus on young children in schools, advertising etc., it seems applicable that the Government has targeted those that will be influenced most.

A systematic approach for delivering improvements in health will require a range of organisations to work together, such as those listed in Table 9,
plus other NHS bodies like the Health Protection Agency, NICE and the NHS Modernisation Agency.

"Choosing Health" stresses the importance of co-ordinated working between different government departments under new Labour, an example being that any action to tackle poverty, unemployment and housing will have an effect on health, especially in the most disadvantaged. Therefore, alongside all the specific obesity-targeted plans in Table 9, "Choosing Health" recommends that health inequalities be tackled and the more 'global' plans on poverty, housing, education and employment will have an effect on this.

To deliver the policy, the Government acknowledges that it requires new models and new research. The finances for these have been put aside to ensure the workforce will have the capability for delivering the targets and the information to support change. The Government is committed to the New Burdens Doctrine and will reimburse LA's fully for any extra costs they face as a result of the policies in this White Paper. 'Choosing Health' makes specific reference to investment in health education campaigns, school nurses, health trainers and obesity services.

The DoH Forward Plan (2005b) supports key targets for action in 2005/6. These focus on 'Choosing Health', particularly obesity targets and the use of partner organisations to implement them.

**Other actors involved**

The White Paper acknowledges the challenges of the solutions provided. They are only likely to occur if the right people with the right skills are in place to deliver them. Additional funding will be required to complete skills training and then evaluate the progress of new service delivery.
Several professionals are involved with delivering the obesity targets of the White Paper:

**Dietitians**

Registered Dietitians in the UK hold the only legally recognised graduate qualification in nutrition and dietetics. Their unique skill is to interpret and translate the science of nutrition into practical, safe and impartial information about food and health. The White Paper recognises this and suggests people should have access to a dietitian—yet an increase in numbers is not suggested.

The issue for dietitians is availability, the profession is small. More dietitians will be needed if the NHS is to tackle obesity effectively.

**School Nurses**

Unlike dietitians, the policy states that the number of school nurses should be increased. This conflicts with the current economic climate; for example, in South East Hampshire the number of school nurses is being reduced. School nursing has a unique role in the delivery of health messages to young people. This is recognised in the White Paper but seems to not be translated into local health politics.

**NHS Health Trainers**

These new posts have been discussed earlier. Their introduction is a move to meet the Government's ideology that support for health related change should come from 'next door' rather than from 'on high'. Therefore, these individuals will be recruited locally, understanding the issues of the community. They will be accredited to the NHS, offering practical help and support. These individuals will need training; a national course and accreditation scheme is under development. They will work with smoking
cessation, activity levels and safe sex, as well as dietary change. These individuals will be in place by 2006, for areas of highest need, and across the country by 2007. It is envisaged that these individuals will access other health professionals, if needed. Their skills will be in local awareness, with motivational skills to help people develop personal health guides.

One can only assume that the training of lay people for the smoking cessation service was copied for this target. Therefore, this is a governance issue in terms of clinical practice.

This is also a staffing issue, as a large number of Health Trainers will be required to reduce the rising rates of obesity. The White Paper does not state whether these individuals will be paid; so the funding of these posts has not been fully considered.

**How is it to be evaluated?**

One of the key action points is that the DoH will publish half-yearly progress reports on key indicators for the targets that relate directly to improving health with contributions from all departments involved.

The White Paper has been followed by 'Delivering Choosing Health' (Dept. of Health, 2005d) which shows how to achieve the goals of the White Paper. These are steps to be achieved in the next three years. The plan is supported by two action plans, published in March 2005; the food and health action plan, (Dept. of Health, 2005a) and the physical activity (Dept of Health, 2005c) plan. The action plan 'Choosing a Better Diet' has many targets, set out in a time frame. There are over 30 targets listed to be met by September 2005. The majority of these have not been delivered on time. Using the DoH website, there appears to be no other publication providing an update of progress on the targets at this time.
The Government has been ambitious, acknowledging the urgency of the Wanless (2004) and Health Select Committee (UK Parliament, 2004) Reports by acting quickly. However, obesity is a complex issue and, in the current economic climate, the NHS is preoccupied with other health targets and maintaining the service. This could be one reason why action to meet the targets is slow to start.

**Conclusion**

The NHS Plan (2000) states that ‘to achieve its goals, the NHS will have to become an organisation that is able to embrace continuous emergent change’. The issues for obesity show that “Choosing Health” is a policy that is working on emergent change, having external factors such as economics and political drivers at variance with internal factors such as professionals and obese people. (Iles and Sutherland, 2001).

Obesity is a global problem. Within the European Union, Britain leads the way on the increasing rates of obesity. Our health service, which has the principle of ‘free at the point of delivery’, cannot achieve its goal if the rates of obesity continue to increase. New Labour ideology supports enabling the individual to make personal decisions about health and helping them to act on change. However, when tackling obesity, the issues are complex reflecting the nature of the condition.

“Choosing Health” makes many brave moves. However, the implications for a health service that currently does not treat obesity are costly. The costs are not just economic, including resource needs as well. The DoH plans to invest £1 billion in public health over the next three years to help implement the White Paper, with £220 millions over three years for school meals, but it is not clear if this is all new money. There has been no new money in the
first year of implementation. The 'Health of the Nation' report did not cause a readjustment of investment priorities, which was one of its main failings. The Government must fund 'Choosing Health' if the policy is to succeed. The policy requires change from professionals and the White Paper supports a model where new methods of working will require training. The policy, therefore, has significant implications for resourcing manpower and governance. Many of the solutions and models posed in the White Paper are not evaluated. However, such is the magnitude of the problem that action is required now.

Assessment of complex interventions is difficult. The first Wanless Report suggests that tackling obesity will reduce the use of health services; however there will be a need to study the impact of this White Paper to prove this. The Kings Fund (2005) suggests the use of NICE for this. The majority of the examples of practice in Choosing Health' were not evaluated; by evaluation you can inform action.

Overall, 'Choosing Health' is the first government document that has addressed obesity realistically. It outlines a strategy to prevent, identify and manage obesity. Only time will tell if this will have sufficient impact on the weight of the nation.
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www.publications.parliament.uk paragraph 213


www.publications.parliament.uk recommendation 4


www.publications.parliament.uk paragraph 173.


www.publications.parliament.uk paragraph 355.


## Appendix 1 Chronological Pathway of Government Reports to 'Choosing Health'

<table>
<thead>
<tr>
<th>Date</th>
<th>Government Report</th>
<th>Report Contents</th>
</tr>
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<tbody>
<tr>
<td>1992</td>
<td>Health of the Nation</td>
<td>Targets to reduce obesity by 2010</td>
</tr>
<tr>
<td>1997</td>
<td>New Labour Government</td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td>Saving Lives: Our Healthier Nation</td>
<td>Targets CHD &amp; Cancer. No mention of obesity</td>
</tr>
<tr>
<td>1999</td>
<td>The Health of the Nation: A Policy Assessed</td>
<td>No adjustment of investment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No impact on primary care</td>
</tr>
<tr>
<td>2002</td>
<td>Wanless- Securing Our Future Health: Taking a Long Term View</td>
<td>Need to 'catch-up' after Tory administration</td>
</tr>
<tr>
<td></td>
<td>HSC Report</td>
<td>Action Now!</td>
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</table>
Service Development Project

Outpatient Service to Obese Adults

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Doctorate of Clinical Practice Jan 05

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I declare that this essay is wholly my own work, except where acknowledged specifically as the published or unpublished work of others.
Out patient Service to Obese Adults

Definition
The majority (60%) of out-patient referrals to dietitians in Portsmouth require help with weight loss; whether as part of a co-morbid condition eg diabetes, or because they are obese (Body Mass Index >30). The out patient clinics operate at various venues around the district and are made up of a mixture of diet types (e.g. lipid lowering, food intolerances) as well as weight reduction.

In 2004 due to staffing levels, all out-patients were classified by degree of urgency for appointments. Obese individuals were classified as low priority and the numbers waiting were excessive. Service and Divisional management stressed the need for service development. The use of funding from the consultant practitioner development programme through the Wessex Workforce Development Confederation enabled the department to lead a project, looking at changes to service delivery. The dietitian employed was a chief dietitian with significant experience in obesity management.

Rationale
An analysis of the status quo was conducted (Nadler and Tushman, 1977) (Figure 1).

- The task focussed on the out patient service for weight loss
- Within the formal organisation the continued reduction in staffing levels meant that new ways of working had to be considered.
- The informal culture supported the view of "we have always done it this way" whilst illustrating the 'need for change'. The clinics were predominantly new patients (5 versus 4 follow up appointments). This prevented patients getting repeat appointments for up to 4 months. Continuing weight loss requires regular and continual contact (Glenny et al, 1997; Cowburn and Summerbell, 1998; Rapoport and Perry, 2000).
- Dietitians, as the individuals involved, were reporting that they felt ineffective with weight loss management. Clinics operated a system of mixed diet types, requiring different education methods in a 30 minute time slot. Similarly, clerical staff were frustrated with the inadequate appointment system.
Lewin's model of change (1951) site that to energise change requires an unfreezing of the status quo, effecting the change then refreezing of the new state. By highlighting the forces that maintain the status quo, it is possible to take action to make change in the desired direction (Wilson, 1992).

Figure 2 shows the forces present. Driving forces were:

- A leader who had the support of managers in developing a new ways of working.

- The lack of staff and increased number of referrals for weight loss.

- The political agenda was and is a significant driving force. The public health white paper (DH, 2004), plus more recently the draft NICE guidance on Obesity (NICE, 2006); states that dietitians firmly should be part of the obesity task force. Therefore as a profession we need to be developing models that demonstrate effectiveness.
Restraining forces for change were:

- The overwhelming inertia of obesity treatment. A staff SWOT analysis (Ansoff, 1965) (Appendix 1) reflected their fear of poor skills. They know and undertake best treatment (British Nutrition Foundation, 1999) whilst fearing that results are not effective, in part due to lack of support. This identified the priorities for action.

- Environmental issues were the lack of out patient space and correspondingly a lack of dietitian to undertake new out-patient sessions.

- The culture of clinic design, with the mix of new and follow-up appointments that supported the inertia of departmental operations.

Increasing the driving forces may result in equal but opposite forces being applied from the restraining forces (Lewin, 1951). A weight loss clinic (WLC) was developed to implement change by restraining the forces through an interactive approach, relating research to practice, as any proposed change should offer benefits to frontline staff (Ywye & McClenahan, 2000)

**Planning**

Using the 7 S model (Waterman, et al., 1980) (Figure 3)
Staff: A more effective way of working will ease staff workload and the WDC funding allowed the development to happen without a 'cost' to the department.

Skill: From the SWOT analysis; the dietitians feel their skills are poor, yet recognise that they have the knowledge to help people lose weight. Specialist dietitians are essential for the treatment of obesity since it is a complex and heterogeneous disease that affects individuals differently (Brownell and Wadden, 1991). The value specialist chief dietitian in the WLC should not be underestimated.

Structure: Frequent follow up was seen to be vital in the force field analysis and is crucial in achieving results, (Glenny et al, 1997; Cowburn and Summerbell, 1998). The WLC operate weekly with 3 clinics in a month taking a mix of new and follow up patients, then a fourth clinic taking only follow up patients. The same dietitian conducted all clinics.

Systems: Patients call for an appointment. Those requiring weight reduction are offered an appointment in the WLC. As not all are able to attend on a 'clinic day', some patients remain in the 'mixed' diet type clinics run by other dietitians (Appendix 2)

Strategy: The clinic took patients from one particular Primary Care Trust, which is currently developing their obesity strategy using dietary treatment. This clinic is timely as it provides evidence on treatment, effectiveness and patient satisfaction.

Style of management: Management view the WLC as a new way of working.

Sharing of Beliefs: Audit results would be discussed with all relevant staff, constituting the 'refreezing' of the change process.
Evidence
An audit registered by the Trust illustrated the benefits of the Weight Loss Clinic against the 'traditional approach' to weight loss management within the dietetic out patients. (Appendix 3)

The results show the new clinic delivers an average of 6.2% weight loss against 1.1% over the period of dietetic contact. The attrition rates were significantly reduced, particularly in follow up appointments. Results have shown that 6 contacts deliver between 5 – 10% weight loss. Therefore, the new clinic is both effective and meets weight loss governance (Goldstein, 1992).

From the audit results, the WLC proves to be more effective in delivering weight loss targets, despite using similar dietary advice to the other outpatient clinic (Appendix 3). A system of defined treatment length can be introduced, leading to the main research question of 'how do we support people to maintain their weight loss?'

Process Involvement
Patient's views of the clinic and of seeing the dietitian regularly were assessed using a patient satisfaction survey (Appendix 3). All patients preferred seeing only one dietitian and 55% stated that they are getting the correct amount of contact. By assessing the patient's perception of the clinic, the department has achieved an evaluation of dietetic treatment by patients.

The audit results were discussed with all out patient team members and it was agreed to audit the clinic against other PCT clinics within the district. Although this approach may not be suitable for everyone (Grace et al, 1998) the overwhelming preference for seeing a single dietitian and the desire for more regular contact can not be ignored. Weight loss correlates positively with treatment duration, number of therapist contact, therapist experience and involvement of the patients' family (Wing, 1995).

The pilot clinic has cost 2 hours of chief dietitian time per patient contact compared to 1 hour of senior dietitian contact. Some staff training will be required, primarily to build confidence. This will be the refreezing of the change process.

Conclusion
This service development has provided an opportunity to assess the need for change through a new way of working to meet service demands. It reviewed staff feelings about treatment of obese adults and formulated a system that appears to work in the patient's best interest and meets the governance of weight loss management.
References


Appendix 1 SWOT Analysis

Conducted by basic grade (new entry) dietitians, senior dietitians, clerical staff and dietetic manager

<table>
<thead>
<tr>
<th>STRENGTHS</th>
<th>WEAKNESSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our knowledge</td>
<td>Not good at it</td>
</tr>
<tr>
<td>Time with patient</td>
<td>We are soft – any easy touch</td>
</tr>
<tr>
<td>1:1 appointments</td>
<td>Don’t want to see them – Ineffective</td>
</tr>
<tr>
<td>We are still getting referrals</td>
<td>Staff burn out / staffing numbers</td>
</tr>
<tr>
<td>Resources available</td>
<td>Obesity has been normalised by some patients/society</td>
</tr>
<tr>
<td>Improves the profile of the department</td>
<td>Commercial agencies/ Money/ Time</td>
</tr>
<tr>
<td>Need training</td>
<td></td>
</tr>
</tbody>
</table>

OPPORTUNITIES

THREATS
Appendix 2 Department Referral Pathway

Referral for Obese Patient BMI > 30

Patient sent a letter inviting them to attend for an appointment

Patient telephones and is offered Weight Loss Clinic (wlc)

Patient offered assessment at wlc

Following assessment a series of follow up regular appointments arranged until patient reaches weight loss of 5 - 10%

Unable to make date of wlc, so offered an appointment within other 'mixed' diet type clinic
Appendix 3 Audit of Weight Loss Clinic

Method

The weight loss clinic started in February 2004. The results of all new patients referred to that clinic were studied over 12 months, to April 2005.

The results were compared to all patients referred for weight loss advice and seen in other dietetic clinics within the same out patient department over the same period. The majority of these patients were GP referral from the PCT area. All patients booked in to either the weight loss clinic or the ordinary dietetic clinic for weight loss over the specified time period was listed. Their record cards were selected from file and the results of their interaction with the dietitian were listed on an Excel spreadsheet. Demographic data, number of attendances, dietary advice given and body weight was noted on the data base.

Results

<table>
<thead>
<tr>
<th>Clinic</th>
<th>Number of patients referred</th>
<th>Average Age</th>
<th>Average BMI at beginning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Range of age</td>
<td>Range of BMI</td>
</tr>
<tr>
<td>Weight Loss Clinic</td>
<td>84</td>
<td>44</td>
<td>30 - 66</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18 - 78</td>
<td>42.5</td>
</tr>
<tr>
<td>Ordinary Clinic</td>
<td>72</td>
<td>38</td>
<td>28 - 51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26 - 75</td>
<td>38</td>
</tr>
</tbody>
</table>

Of note is the high number of obese patients put into the weight loss clinic over the year. Twenty two percent of the group were transferred after assessment to the mental health dietetic caseload, as the patients were recognised as having binge eating problems or had been referred for bariatric surgery, and therefore better seen in an environment where their needs could be met.

The patients referred to ordinary clinic may well have had some binge eating problems (but not bariatric assessment), but this was not noted in record cards and patients were not transferred.
<table>
<thead>
<tr>
<th>Clinic</th>
<th>Failure To attend at 1&lt;sup&gt;st&lt;/sup&gt; appointment</th>
<th>Failure to attend at 2&lt;sup&gt;nd&lt;/sup&gt; &amp; subsequent appointments</th>
<th>Patients Discharged in Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight Loss Clinic</td>
<td>11.6%</td>
<td>7.8%</td>
<td>4%</td>
</tr>
<tr>
<td>Ordinary Clinic</td>
<td>14.6%</td>
<td>27.3%</td>
<td>17%</td>
</tr>
</tbody>
</table>

**Result of Weight Loss**

<table>
<thead>
<tr>
<th>Clinic</th>
<th>Mean Weight loss inc. FTA numbers</th>
<th>Mean (&amp; range) Weight loss by regular attendance</th>
<th>Mean ( &amp; Range) Weight loss per month of dietetic contact</th>
<th>Mean ( &amp; Range) Weight loss per Dietetic contact</th>
<th>Mean ( &amp; Range) % body weight lost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight Loss Clinic</td>
<td>3.22Kg (-29.7Kg to +4.9Kg)</td>
<td>1.1Kg (-3.8Kg to +1.6Kg)</td>
<td>1.45Kg (-4.1Kg to +1.6Kg)</td>
<td>6.2% (0.8% - 26.2%)</td>
<td></td>
</tr>
<tr>
<td>Ordinary Clinic</td>
<td>0.64Kg (-10.4 Kg - +18.8 Kg)</td>
<td>0.51Kg (-6.4Kg - +3.7Kg)</td>
<td>0.55Kg (-6.4Kg - +9.4Kg)</td>
<td>1.15% (-8.2% - +22.8%)</td>
<td></td>
</tr>
</tbody>
</table>

Of note is that 9 in the sample of those in the ordinary clinic gained over 1Kg during their time in dietetic contact, whereas only 3 gained in the weight loss clinic, with 2 gaining over 1kg

**Diets Offered**

<table>
<thead>
<tr>
<th>Clinic</th>
<th>Dietary Targets</th>
<th>BHF diet</th>
<th>Low Fat</th>
<th>Calorie Counting</th>
<th>Low CHO</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight Loss Clinic</td>
<td>22</td>
<td>13</td>
<td>5</td>
<td>6</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>WLC – those FTA</td>
<td>9</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Ordinary clinic</td>
<td>21</td>
<td>9</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Ordinary clinic – those FTA</td>
<td>20</td>
<td>12</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
**Patient satisfaction**

After analysis of the audit results it was decided to try and ascertain patients' views on the WLC and the effect of seeing the same dietitian regularly. A patient satisfaction survey was undertaken in Jan/Feb 2006, following a focus group of patients in the WLC. As student dietitan conducted a questionnaire based on the Likert scale, covering 39 questions. The student sat in the outpatient waiting room over 6 outpatient clinics and asked people attending the WLC if they would be happy to complete their questionnaire. Only one patient refused. All the others completed the questionnaire before their consultation with the dietitian hence minimising bias on that visit.

**Characteristics of the 27 patients who completed a questionnaire**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>No. of patients</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>7</td>
<td>26</td>
</tr>
<tr>
<td>Female</td>
<td>20</td>
<td>74</td>
</tr>
<tr>
<td><strong>Age Range</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 30 years</td>
<td>5</td>
<td>19</td>
</tr>
<tr>
<td>30 to 45 years</td>
<td>12</td>
<td>44</td>
</tr>
<tr>
<td>45 to 60 years</td>
<td>8</td>
<td>30</td>
</tr>
<tr>
<td>60 years and over</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td><strong>Duration of time attending the clinic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 to 3 months</td>
<td>5</td>
<td>19</td>
</tr>
<tr>
<td>3 to 6 months</td>
<td>5</td>
<td>19</td>
</tr>
<tr>
<td>6 to 9 months</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>9 to 12 months</td>
<td>5</td>
<td>19</td>
</tr>
<tr>
<td>Over 12 months</td>
<td>8</td>
<td>29</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>16</td>
<td>59</td>
</tr>
<tr>
<td>Part-time</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Unemployed</td>
<td>7</td>
<td>26</td>
</tr>
<tr>
<td>Retired</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td><strong>Received treatment with another dietitian previously</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>16</td>
<td>59</td>
</tr>
<tr>
<td>No</td>
<td>11</td>
<td>41</td>
</tr>
<tr>
<td><strong>Benefited from previous dietetic treatment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>No</td>
<td>7</td>
<td>26</td>
</tr>
<tr>
<td>N/A</td>
<td>17</td>
<td>63</td>
</tr>
</tbody>
</table>
Happy with weight loss achieved

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>74</td>
<td>26</td>
</tr>
</tbody>
</table>

Felt able to achieve the weight loss without the support of the dietitian

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>25</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>92</td>
<td>4</td>
</tr>
</tbody>
</table>

Email access

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>74</td>
<td>26</td>
</tr>
</tbody>
</table>

As can be seen the average age is in agreement with the first cohort in the audit. A significant number had seen other dietitians previously. The majority were happy with their weight loss to date and were keen to have dietetic support to achieve weight loss.

The questionnaire questions and answers. % percentage and out of the total no. (27).

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Agree % &amp; no.</th>
<th>Agree % &amp; no.</th>
<th>Undecided % &amp; no.</th>
<th>Disagree % &amp; no.</th>
<th>Strongly Disagree % &amp; no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I have been able to make appointments as regularly as I feel necessary</td>
<td>29.63 (8)</td>
<td>66.67 (18)</td>
<td>3.70 (1)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2. My appointments have run on time</td>
<td>22.22 (6)</td>
<td>70.37 (19)</td>
<td>0</td>
<td>7.41 (2)</td>
<td>0</td>
</tr>
<tr>
<td>3. I am happy with the length of the consultation</td>
<td>33.33 (9)</td>
<td>59.26 (16)</td>
<td>7.41 (2)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4. I would like to see the dietitian more frequently</td>
<td>14.81 (4)</td>
<td>29.63 (8)</td>
<td>25.93 (7)</td>
<td>29.63 (8)</td>
<td>0</td>
</tr>
<tr>
<td>5. I prefer to see the same dietitian</td>
<td>51.85 (14)</td>
<td>48.15 (13)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6. I feel sufficient literature has been provided (e.g. dietary information)</td>
<td>25.93 (7)</td>
<td>66.67 (18)</td>
<td>7.41 (2)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7. I enjoy having a one-to-one session</td>
<td>55.56 (15)</td>
<td>44.44 (12)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Question</td>
<td>Strongly Agree % &amp; no.</td>
<td>Agree % &amp; no.</td>
<td>Undecided % &amp; no.</td>
<td>Disagree % &amp; no.</td>
<td>Strongly Disagree % &amp; no.</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>-----------------------</td>
<td>---------------</td>
<td>------------------</td>
<td>------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>8. I would have preferred to have some group sessions</td>
<td>0</td>
<td>7.41 (2)</td>
<td>18.52 (5)</td>
<td>62.96 (17)</td>
<td>11.11 (3)</td>
</tr>
<tr>
<td>9. I would have liked to do both individual and group sessions</td>
<td>7.41 (2)</td>
<td>7.41 (2)</td>
<td>25.93 (7)</td>
<td>48.15 (13)</td>
<td>11.11 (3)</td>
</tr>
<tr>
<td>10. I would have liked to have been offered exercise classes</td>
<td>7.41 (2)</td>
<td>25.93 (7)</td>
<td>33.33 (9)</td>
<td>25.93 (7)</td>
<td>7.41 (2)</td>
</tr>
<tr>
<td>11. I would have liked to meet other patients/clients</td>
<td>7.41 (2)</td>
<td>7.41 (2)</td>
<td>25.93 (7)</td>
<td>33.33 (9)</td>
<td>7.41 (2)</td>
</tr>
<tr>
<td>12. I feel I have benefited from my appointments with the dietitian</td>
<td>37.04 (10)</td>
<td>51.85 (14)</td>
<td>11.11 (3)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>13. I have feelings of anxiety before my appointment</td>
<td>11.11 (3)</td>
<td>25.93 (7)</td>
<td>11.11 (3)</td>
<td>40.74 (11)</td>
<td>11.11 (3)</td>
</tr>
<tr>
<td>14. I feel positive after my appointment</td>
<td>29.63 (8)</td>
<td>62.96 (17)</td>
<td>7.41 (2)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>15. The appointments have met with my expectations</td>
<td>22.22 (6)</td>
<td>66.67 (18)</td>
<td>11.11 (3)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>16. I feel motivated after seeing the dietitian</td>
<td>37.04 (10)</td>
<td>55.56 (15)</td>
<td>7.41 (2)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>17. I have developed a good rapport with the dietitian</td>
<td>40.74 (11)</td>
<td>51.85 (14)</td>
<td>7.41 (2)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>18. I trust the dietitian</td>
<td>40.74 (11)</td>
<td>59.26 (16)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>19. I feel that the dietitian understands me</td>
<td>25.93 (7)</td>
<td>70.37 (19)</td>
<td>3.70 (1)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>20. The dietitian provides sufficient support</td>
<td>33.33 (9)</td>
<td>62.96 (17)</td>
<td>3.70 (1)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>21. I am able to express myself honestly</td>
<td>48.15 (13)</td>
<td>48.15 (13)</td>
<td>3.70 (1)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Question</td>
<td>Strongly Agree % &amp; no.</td>
<td>Agree % &amp; no.</td>
<td>Undecided % &amp; no.</td>
<td>Disagree % &amp; no.</td>
<td>Strongly Disagree % &amp; no.</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>------------------------</td>
<td>--------------</td>
<td>------------------</td>
<td>-----------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>22. I feel that the dietitian makes inappropriate judgements about me</td>
<td>0 (6)</td>
<td>22.22 (6)</td>
<td>7.41 (2)</td>
<td>48.15 (13)</td>
<td>22.22 (6)</td>
</tr>
<tr>
<td>23. I enjoy attending appointments</td>
<td>18.52 (5)</td>
<td>66.67 (18)</td>
<td>7.41 (2)</td>
<td>7.41 (2)</td>
<td>0</td>
</tr>
<tr>
<td>24. I am satisfied with the recommendations provided by the dietitian</td>
<td>22.22 (6)</td>
<td>74.07 (20)</td>
<td>3.70 (1)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>25. I have received suitable advice when times have been difficult</td>
<td>29.63 (8)</td>
<td>66.67 (18)</td>
<td>3.70 (1)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>26. I developed a good rapport with the dietitian during my first appointment</td>
<td>33.33 (9)</td>
<td>62.96 (17)</td>
<td>3.70 (1)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>27. I felt comfortable with the dietitian at the first appointment</td>
<td>40.74 (11)</td>
<td>51.85 (14)</td>
<td>7.41 (2)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>28. I have gained confidence</td>
<td>18.52 (5)</td>
<td>51.85 (14)</td>
<td>25.93 (7)</td>
<td>3.70 (1)</td>
<td>0</td>
</tr>
<tr>
<td>29. I have achieved set goals</td>
<td>3.70 (1)</td>
<td>25.93 (7)</td>
<td>59.26 (16)</td>
<td>11.11 (3)</td>
<td>0</td>
</tr>
<tr>
<td>30. I feel happier about my body image</td>
<td>7.41 (2)</td>
<td>18.52 (5)</td>
<td>48.15 (13)</td>
<td>18.52 (5)</td>
<td>7.41 (2)</td>
</tr>
<tr>
<td>31. I feel more able to continue with my diet</td>
<td>22.22 (6)</td>
<td>51.85 (14)</td>
<td>22.22 (6)</td>
<td>3.70 (1)</td>
<td>0</td>
</tr>
<tr>
<td>32. I feel able to embark on new plans</td>
<td>18.52 (5)</td>
<td>48.15 (13)</td>
<td>29.63 (8)</td>
<td>3.70 (1)</td>
<td>0</td>
</tr>
<tr>
<td>33. I am unsure how long I will continue to see the dietitian</td>
<td>11.11 (3)</td>
<td>44.44 (12)</td>
<td>29.63 (8)</td>
<td>11.11 (3)</td>
<td>3.70 (1)</td>
</tr>
<tr>
<td>34. I am concerned that I will put weight on if I stop appointments</td>
<td>29.63 (8)</td>
<td>18.52 (5)</td>
<td>29.63 (8)</td>
<td>22.22 (6)</td>
<td>0</td>
</tr>
<tr>
<td>Question</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Undecided</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>----------------</td>
<td>-------</td>
<td>-----------</td>
<td>----------</td>
<td>------------------</td>
</tr>
<tr>
<td></td>
<td>% &amp; no.</td>
<td>% &amp; no.</td>
<td>% &amp; no.</td>
<td>% &amp; no.</td>
<td>% &amp; no.</td>
</tr>
<tr>
<td>35. I am unsure about the target weight I am aiming for</td>
<td>3.70 (1)</td>
<td>18.52 (5)</td>
<td>22.22 (6)</td>
<td>51.85 (14)</td>
<td>3.70 (1)</td>
</tr>
<tr>
<td>36. I have been able to park at the hospital without difficulty</td>
<td>3.70 (1)</td>
<td>37.04 (10)</td>
<td>25.93 (7)</td>
<td>22.22 (6)</td>
<td>11.11 (3)</td>
</tr>
<tr>
<td>37. I feel comfortable in the waiting room</td>
<td>3.70 (1)</td>
<td>66.67 (18)</td>
<td>18.52 (5)</td>
<td>11.11 (3)</td>
<td>0</td>
</tr>
<tr>
<td>38. I think the lighting in the consulting room provides a suitable atmosphere</td>
<td>11.11 (3)</td>
<td>66.67 (18)</td>
<td>18.52 (5)</td>
<td>3.70 (1)</td>
<td>0</td>
</tr>
<tr>
<td>39. I feel uncomfortable with the temperature of the consulting room</td>
<td>0</td>
<td>18.52 (5)</td>
<td>22.22 (6)</td>
<td>44.44 (12)</td>
<td>14.81 (4)</td>
</tr>
</tbody>
</table>

It appears from the results of the questionnaire that knowing the dietitian they were seeing benefited the patients. However it was difficult to assess whether their opinions were influenced by seeing a chief dietitian.

**Discussion**

The ordinary dietetic clinic had a total of 9 different (senior and newly qualified) dietitians that may have seen the patients at any of their appointments, whereas, the weight loss clinic is operated by one (chief) dietitian. Therefore, it could be suggested that having consistent professional contact with someone they had developed a relationship with has facilitated dietary change more successfully in patients. The clinic also runs weekly and it is designed to give frequent follow up to patients. The range of appointments is up to 10 contacts over a year, whereas in the ordinary clinic patients can be seen over a whole year, but only seen by the dietitian twice.

The type of dietary advice given is similar between the two clinics; however, the weight loss clinic uses calorie counting, low fat and low carbohydrate diets. These latter types of diet are only used in further appointments after initial dietary changes have been achieved.
Recommendation

- Creating 'weight loss' only clinics including regular follow up slots.
- Offering patients a 'set' period of treatment, to encourage throughput.
- Designing an effective remote follow up system to help weight loss maintenance.
Appendix 4 PowerPoint slides (Presented to tutors March 28th 2006)

Out-patient Service to Obese Adults
Denise Thomas
Doctorate of Clinical Practice 05

Approach – Force Field Analysis
(Lewin, 1951)

- Driving Forces
  - Personal
  - Leadership
  - Organisational
    - Lack of staff
    - Volume of work
  - Government agenda
    - Choosing health
    - NICE guidance

- Restraining Forces
  - Individual
    - Skills – always done this way
  - Organisation
    - Strength of culture
    - Lack of resources
    - Environmental

Process
(Waterman, Peters & Philips, 1993)

- Staff – Dietitian time funded by WDC
- Skills – recognition that skills meet governance
- Structure – frequent follow up required.
- System – to create a specific weight loss clinic.
- Strategy – meets Govmt, PCT & HT agenda
- Management Style – support by service and divisional manager
- Beliefs Shared: final goal
Process of Change

- Collect data – Audit of weight loss clinic
- Analyse data –

<table>
<thead>
<tr>
<th>Variable</th>
<th>Ordinary Clinic</th>
<th>Weight Loss Clinic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstinence rate - Initial app</td>
<td>14.6%</td>
<td>11.6%</td>
</tr>
<tr>
<td>Follow up</td>
<td>27.3%</td>
<td>7.8%</td>
</tr>
<tr>
<td>Av. Weight Loss</td>
<td>0.84 Kg</td>
<td>3.22 Kg</td>
</tr>
<tr>
<td>Av. % Body Weight Loss</td>
<td>1.15%</td>
<td>0.3%</td>
</tr>
<tr>
<td>New patients in 1 year</td>
<td>72</td>
<td>84</td>
</tr>
</tbody>
</table>

Process Involvement

- Creating a vision
  - Consultation with staff over audit results
- Further action
  - Patient satisfaction survey
  - Audit of other PCT clinics
- Implement change
  - Replication of the model
  - Training of other staff
Research Log

The entries below are observations made during the period 2005 – 2008 whilst completing the DClinPrac at EHIMS in the University of Surrey

Topic review

This was the beginning of an analytical consideration of a topic. Obesity is a key driver for dietetics and for National Health Service management. It is considered that obesity is the biggest public health issue facing the United Kingdom at this point in time.

From this several key areas came through:

- Evidence for effective dietetic management
- Attitudes of dietitians to treating obese people.
- Professional support to facilitate weight loss strategies in individuals.
- Maintenance of weight loss.
- New ways of working including the internet.

Several of these topics began to nurture ideas about various research questions:

1. How effective are dietitians in managing weight loss for obese people?
2. How can dietitians work in novel ways to meet the increasing numbers of obese people?
3. Is the shape and size of the dietitians important when treating obese people?

April 2005

An excellent seminar led by Professor Robbins, began to formulate various ideas. Consideration was taken into my epistemological stance (positivist) and so I began to formulate an idea of research design and the need to meet quantitative approaches. The seminar enabled some analysis through questions and answers to ensure critical analysis of the topic review. From this two main elements came forward to support the summer's work.

1. Question 1 above was a basis for the service development project. There was an opportunity to use service development in Portsmouth to analyse change management and answer question1.
2. Question 2 above seemed to be the most potential as a research question to be the main project.

Drivers

At this time various political and local drivers were at play within the acute Trust where I work. The NHS trust that I work for was undergoing financial restraints to meet the needs of preparation for Foundation Trust status. As such the dietetic department were being reduced in size and posts were frozen to recruitment. The decision was made to reduce the number of outpatient clinics. This was set against a background of a) the Strategic Health Authority financing a consultant practitioner programme for Allied Health Professionals and b) increased demand for obesity management by local general practitioners. The dietetic department was fortunate to gain some funding and as such I was given an extra day a week to develop a trial a 'consultant role' within obesity management. With this day I developed the Weight Loss Clinic to help with the numbers of obese patients being referred and being placed on waiting lists.

The Weight Loss Clinic provided the data for an audit on the effectiveness of treating obesity in a dietetic led clinic. Therefore, it would help in answering on a local level the 1st research question: are dietitians able to offer an effective weight management programme? It also allowed service development and as such produced the evidence for the service development project.

June 2005

The policy analysis was the first major piece of assessed work set for the DClinPrac. This had to be submitted by September 2005. Despite several discussions about it with colleagues and supervisors the choice of a policy was difficult. The only document that seemed relevant was the Government’s public health white paper: Choosing Health.

A meeting with the course director looking at analysis tools still did not help with a selection of one that could accommodate the enormity of the White Paper. My confidence wavered but the beneficial effects of completing the topic analysis and how ideas had developed from that, full reading of the policy began.

Various supporting documents were read:

- Wanless reports
- Food standards agency work on Family Food
- Five a Day strategy
- Saving Lives
Having completed the Power, Politics and Policy seminars and reading the literature above consideration of the drivers that were at play, some of which had been so pertinent to changes within my own work, became real.

Within local management meetings, the knowledge acquired through reading was helpful at illustrating the depth of knowledge I was gaining as a result of the Doctoral studies.

**November 2005**

The module on emotions and leadership in organisations was completed this autumn. It was one of the best modules for my personal development. The sessions were thought provoking and linked the changes in professional practice and knowledge base.

Knowledge of personality typing helped to define the workload of the doctorate and my local NHS work.

**Service Development Project**

An audit was registered with the local audit department and full analysis of the results of the weight loss clinic over the last year was completed. Every year the department supervises several graduate student projects. This year two of the girls helped with the analysis of data from the audit and completed a patient's satisfaction survey.

Change management was a good example of understanding the theoretical basis of behind operational practice. The service development project was frustrating due to the limited word count, I could have written so much on the topic.

**Project Development as a result of the Service Development (Summer 2006)**

The service development project supported the development of the research question.

The question was: does email contact with a dietitian assist in weight loss maintenance?

This would move the service development project on a level, meeting the idea of new ways of working and meet the policy targets of addressing new treatment programmes for obese patients. Therefore, within the pathway of
the DClinPrac, the project was advancing clinical priorities and assisting in changes to clinical practice.

Two crucial things had to occur before ethics could be completed. I needed to gain the

- The permission of the NHS Trust to use the email system for contacting patients
- How many patients were needed to make the study viable?

**Summer 2006**

Time line was written aiming for a submission of the research proposal in August.

- Email issue – this required a total rewrite of the hospital email policy to allow email to be used by patients to NHS professionals.
- Assistance of the local statistician helped with the power calculation.

A research design was sketched out using the positivist randomised controlled trial.

A full literature search was undertaken searching Medline, CINAHL and the development of a full proposal was completed alongside the ethical submission.

The latter proved very helpful as it provided a systematic approach to the writing of a full proposal.

September 2006 the research proposal was submitted to the University and local ethics committees and the ethical approval was gained by November 2006.

**Research Project**

Recruitment was initially a flurry of activity as there had been many patients who were eligible for entry into the study. Management of the study emails became challenging and required development of new systems not previously considered in the research design. Timetables etc., were set up using electronic means to support the study intervention.

**Personal Development May 2007**

My manager of 24 years retired and I had the interview for head of service. During the selection process I was able to talk about political drivers and policies confidently. My research and service development projects are both mentioned at interview. I illustrated new ways of working, and presented to the interview panel on leadership and was able to embed my
presentation in theory. My role in education in both the undergraduate and post graduate courses at University of Surrey are mentioned.

There is no doubt that the wealth of knowledge gained over the previous 2.5 years have shown in the application and interview process for this post. I was offered a Band 8b post as Head of Nutrition and Dietetics.

The challenge was to now continue to recruit from the weight loss clinic, manage the project whilst undertaking this new role.

Analysis of Data

By February 2008 it was certain that recruitment to the project could end as numbers were viable for analysis at this stage. All participants in the study had completed the project by March 2008 and analysis of data began.

Statistics were always going to be a problem. Help from my supervisor allowed transfer of the Excel data collected to date to be transferred into SPSS. I took a week off work in March and began analysis. A visit to the statistician did not build confidence and there was increasing pressure to understand what I had from my results and to begin writing the results chapter.

The first draft of the chapter on results was made by May but I was not sure I really had made the most of the data and did not understand some of the tests I had used. An individual session from a dietetic colleague who was more confident with statistics showed me where I was going wrong. The issue was to understand your data and what you want to show with it. This was such a breakthrough! A long night in July (a Saturday!) helped me to fully grasp what I was trying to achieve and a total rewrite of the quantitative element of the project.

Qualitative Results

This was such fun to explore. Each transcription from the exit interview was colour coded and a thematic analysis took place. Thanks to my supervisor some guidance was given on how it should be written up and interpreted. It certainly 'completed' the results in providing data that is valuable in such an impersonal intervention like email.

Writing Up

My NHS trust was generous in giving me 10 days study leave, which certainly helped in the writing phase. A whole week in June helped me complete the first full draft of the thesis. Various bits of annual leave were taken to support other writing, and a holiday booked for my husband and youngest daughter meant Mum could stay at home and write for a whole weekend without interruption!
Final thoughts

The Doctorate has changed me as an individual. The change was not dramatic but a slow process where elements of knowledge were tested and developed and then illustrated in various interactions between myself, clinicians and managers. Juggling a new post where I manage a large workforce and budget whilst trying to complete the project and the writing up phase was exhausting. I would not recommend it. However you cannot plan life, there will always be elements that are unpredictable, and possibly the challenges I had to face were the most formative of all.