

A new evidence-based model for weight management in primary care: the Counterweight Programme

The Counterweight Project Team*

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Keywords

general practitioner, nutrition
education, obesity, practice nurse,
primary care, treatment models.

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in alphabetical order according to
centre.

Abstract

Background/Aims Obesity has become a global epidemic, and a major preventable cause of morbidity and mortality. Management strategies and treatment protocols are however poorly developed and evaluated. The aim of the Counterweight Programme is to develop an evidence-based model for the management of obesity in primary care.

Methods The Counterweight Programme is based on the theoretical model of Evidence-Based Quality Assessment aimed at improving the management of obese adults (18–75 years) in primary care. The model consists of four phases: (1) practice audit and needs assessment, (2) practice support and training, (3) practice nurse-led patient intervention, and (4) evaluation. Patient intervention consisted of screening and treatment pathways incorporating evidence-based approaches, including patient-centred goal setting, prescribed eating plans, a group programme, physical activity and behavioural approaches, anti-obesity medication and weight maintenance strategies. Weight Management Advisers who are specialist obesity dietitians facilitated programme implementation. Eighty practices were recruited of which 18 practices were randomized to act as controls and receive deferred intervention 2 years after the initial audit.

Results By February 2004, 58 of the 62 (93.5%) intervention practices had been trained to run the intervention programme, 47 (75.8%) practices were active in implementing the model and 1256 patients had been recruited (74% female, 26% male, mean age 50.6 years, SD 14). At baseline, 75% of patients had at one or more co-morbidity, and the mean body mass index (BMI) was 36.9 kg/m² (SD 5.4). Of the 1256 patients recruited, 91% received one of the core lifestyle interventions in the first 12 months. For all patients followed up at 12 months, 34% achieved a clinical meaningful weight loss of 5% or more. A total of 51% of patients were classed as compliant in that they attended the required level of appointments in 3, 6, and 12 months. For fully compliant patients, weight loss improved with 43% achieving a weight loss of 5% or more at 12 months.

Conclusion The Counterweight Programme is an evidence-based weight management model which is feasible to implement in primary care.

Introduction

Over the last two decades the prevalence of obesity in England has trebled from 6 to 21% of the population in men and 8 to 23.5% in women (Bajekal *et al.*, 2001). In Scotland, the prevalence of obesity based on 1998 Health Survey information is similar with 19.6% of men and 22.1% of women being classified as obese (Shaw *et al.*, 2000). Obesity is a contributory risk factor for many serious conditions (Must *et al.*, 1999) and impairs quality of life (Lean *et al.*, 1999). Without intervention, the rising prevalence of obesity will have huge implications for public health and health service expenditure in the future.

Obesity is one of the most important and preventable causes of morbidity and mortality facing primary care today. Primary care remains the public's preferred source of food and health information (Hiddink *et al.*, 1997) and there is evidence that patients' attitudes towards practice-based lifestyle interventions are positive (Wallace & Haines, 1984; Wallace *et al.*, 1987; Richmond *et al.*, 1996). However, primary care practitioners feel uncertain about their effectiveness in fulfilling this role, with lack of time, confidence, training, patient nonconcordance and inadequate reimbursement being the main perceived barriers (Hiddink *et al.*, 1995; Kushner, 1995; Helman, 1997; Steptoe & Doherty, 1999).

Clinical guidelines have been published in the UK on the management of obesity in primary care (SIGN, 1996; the Royal College of Physicians of London, 1998, 2003). One study found that 45.6% of general practitioners (GPs) had read the Scottish Intercollegial Guideline Network (SIGN) Guidelines, but only 34.8% of GPs felt they had been successful in treating overweight (Eley *et al.*, 1999). National Service Frameworks (NSFs) for coronary heart disease (CHD) and diabetes have recommended targets for obesity management, but this alone is insufficient without prioritization in GP contracts.

There is little published research on obesity management in primary care. One study found that the provision of training alone to GPs and practice nurses (PNs) did not improve weight management outcomes for patients (Moore *et al.*, 2003). Few models of best practice have been identified (Bourn, 2001). The Counterweight Programme was set up to evaluate a structured model based on established weight management interventions using theoretical and evidence-based approaches, and to assess the feasibility of primary care as an appropriate setting. The purpose of this paper is to describe the Counterweight model, its theoretical and evidence base, and the initial experience of implementation.

Programme aim

The aim of the Counterweight Programme is to improve the management of obesity in primary care by piloting the provision of a structured approach to care. It is hoped that this may provide a model to be used as part of a multi-strategy approach to reducing the disease burden of obesity in the community.

Programme objectives

- To collect national 'anonymous' obesity data from primary care registers.
- To develop treatment models for the management of obesity in primary care.
- To facilitate the implementation of these treatment models into primary care.
- To evaluate the impact of these models of care, and to inform future practice.

Programme methodology

The programme is a complex intervention incorporating changes to clinician behaviour and practice systems in order to improve the management of obese patients within the practice. The Counterweight model draws on theory and evidence relating to changing health professionals'

behaviour and clinical care, as well as evidence-based models for obesity management. While there is a lack of consensus about effective interventions to change clinician behaviour, multi-faceted interventions targeting different barriers to

change are more likely to be effective than single interventions (Grimshaw et al., 2001). The programme was designed to target change within the practice using a range of strategies based on well-founded theories and approaches (Table 1).

Table 1 Theoretical approaches to changing clinical practice and Counterweight strategies

Approach	Theory	Focus	General strategy	Counterweight strategy
Internal processes				
Educational	Adult learning theories	Intrinsic motivation of professionals	<ul style="list-style-type: none"> • Bottom-up, local consensus development • Small group interactive learning • Problem-based learning 	<ul style="list-style-type: none"> • Local Counterweight Steering groups established • Use of practice-based training in small interactive groups • Use of case studies, co-facilitating clinics and patient groups.
Epidemiological	Cognitive theories	Rational information seeking and decision making	<ul style="list-style-type: none"> • Evidence-based guideline development • Disseminating research findings through courses, mailing, journals 	<ul style="list-style-type: none"> • Development of treatment pathway consistent with evidence-based obesity guidelines • Counterweight newsletter, practice meetings
Marketing	Health promotion, innovation and social marketing theories	Attractive product adapted to needs of target audience	<ul style="list-style-type: none"> • Needs assessment, adapting change proposals to local needs • Stepwise approach 	<ul style="list-style-type: none"> • Audit and needs assessment in each practice, setting practice priorities • Regular practice feedback meetings to monitor progress
External influences				
Behavioural	Learning theory	Controlling performance by external stimuli	<ul style="list-style-type: none"> • Audit and feedback • Reminder systems, monitoring 	<ul style="list-style-type: none"> • Baseline audit, regular feedback of practice outcomes • Patient recall letters
Social interaction	Social learning, innovation theories, Social influence/power theories	Social influence of significant peers/role models	<ul style="list-style-type: none"> • Peer review in local networks • Outreach visits, individual instruction • Opinion leaders • Influencing key people in social networks 	<ul style="list-style-type: none"> • Flagging of patient notes • Practice meetings • Co-facilitation of clinics and groups by WMA • Local consultant lead • Involvement of key PCT leads
Organizational	Management, system theories	Creating structural and organisational conditions to improve care	<ul style="list-style-type: none"> • Total quality management/continuous quality improvement approaches • Changing structures, tasks 	<ul style="list-style-type: none"> • Monitoring and feedback of practice outcomes • Use of screening and treatment guidelines, group programme
Coercive	Economic, power and learning theories	Control and pressure, external motivation	<ul style="list-style-type: none"> • Regulations, laws • Budgeting, contracting • Licensing, accreditation 	<ul style="list-style-type: none"> • NSF, CHD and diabetes • NICE guidelines for orlistat and sibutramine • Local Health Improvement Plans

Adapted from Grol (1997).

Practice recruitment and centres involved

The Counterweight Programme is being conducted in seven regions of the UK: Aberdeen, Bath, Birmingham and Solihull, Glasgow, Hammersmith, Leeds and Luton. The programme was launched in March 2000 with the employment of the seven weight management advisers (WMAs) and a programme co-ordinator, all state-registered dietitians with specialist experience in the field of obesity management. Local implementation of the programme is facilitated by a WMA, and led by a secondary care physician or dietitian working in an obesity or diabetes centre. The Counterweight Programme was approved by the West Midlands Multi-Centre Research Ethics Committee (MREC) and subsequently by Local Research Ethics Committees (LREC) in each region.

Ten practices were recruited in each area, with the exception of Aberdeen where 20 practices were recruited ($n = 80$ nationally). Practices were chosen from those volunteering following letters of invitation. The practices selected represent variability of size, geographical location and social deprivation. Eighteen practices were randomized to act as controls to enable the Counterweight intervention to be assessed excluding confounding effects of other parallel initiatives, such as local Health Improvement Plans and NSFs. Control practices were audited, but received no further intervention with the exception of the feedback of audit results. After 2 years, control and intervention practices were re-audited and the control practices offered training and intervention. In most centres, a local steering group was established with representation from primary care, dietetics, health promotion and other relevant agencies. This was to allow collaboration with local stakeholders as part of a 'bottom-up approach' to encourage practice uptake of the programme (Table 1).

Programme phases

The Counterweight Programme consists of four phases: (1) practice audit and needs assessment, (2) practice support and training, (3) nurse-led patient intervention, and (4) evaluation (Fig. 1).

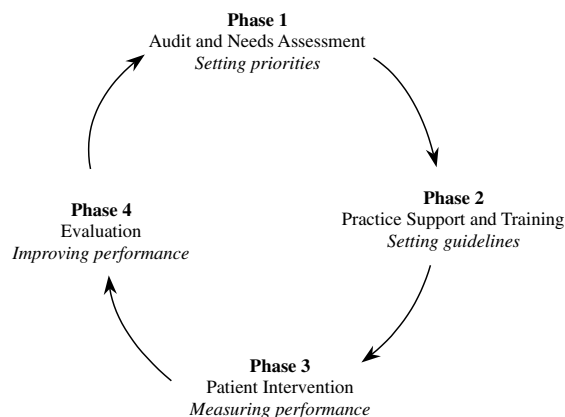


Figure 1 Counterweight programme phases and the evidence-based quality assessment model (in italics).

Each phase was designed to be consistent with the theoretical model of Evidence-Based Quality Assessment (EBQA) proposed by the Evidence-Based Medicine Working Group (1992). EBQA consists of four steps to improve physician adherence to guidelines: (1) setting priorities, (2) setting guidelines, (3) measuring performance and (4) improving performance. Each phase of the Counterweight Programme fits with one of these four steps in the EBQA model. The rationale behind each phase of the programme is provided below.

Audit and needs assessment

Prior to intervention, an audit was conducted in all practices to obtain baseline data on the prevalence and management of obesity, and of related co-morbidities. Structured interviews with GPs and PNs were conducted to determine approaches used to manage obese patients in day-to-day practice, as well as the type and structure of clinics held and patient education materials used. Availability of equipment such as weighing scales, height measures, large pressure cuffs and tape measures was also assessed. GPs and PNs completed a baseline questionnaire to assess their knowledge, attitudes, perceived confidence and willingness to treat obese patients. A detailed comparative audit of obese and normal weight patients was conducted to establish the burden of obesity in the UK primary care population. The

results of the audit are published elsewhere (Laws & Reckless, 2003; McCombie & Lean, 2003; Counterweight Project Team, 2004).

The audit and needs assessment was the first step of the EBQA model – setting priorities: there is a lack of evidence about current approaches to obesity management in UK primary care, which was considered a prerequisite to designing an effective intervention for management. Evidence indicates that identification of local needs and feedback of audit results can be useful in motivating physicians to change future practice (Smith, 2000). This is consistent with health promotion, innovation and social marketing theories (Table 1).

Practice-based training and support

General practitioner upskilling

A 1 h workshop was conducted with GPs and PNs in each practice to feedback the audit results, to discuss the treatment pathway and to set priorities for implementation. Evidence suggests that feedback of audit results related to current clinical practice can help to change future practice (Smith, 2000). By highlighting the burden of obesity in each practice and the current levels of screening and intervention, it was hoped that GPs would support the implementation of a more consistent and structured approach to weight management in the practice.

The main role of the GP was to identify suitable patients for weight management intervention during routine clinical practice and to refer on to the PNs. This involved raising weight as an issue with appropriate patients and possibly discussing the benefits of a 5–10% weight loss. To prompt GP involvement, a desk-top flip chart was provided which included a range of tools to assist in patient screening and motivation. The use of external stimuli to prompt changes in clinician behaviour has been shown to be effective (Austin *et al.*, 1994; McEwen *et al.*, 2002) and is consistent with learning theory (Table 1).

It was envisaged that the GP intervention would be opportunistic and only of 1–5-min duration, to be feasible within a routine appointment. Routine contact with patients in primary care provides repeated opportunities for intervention. Obese

patients advised to lose weight by their physician are significantly more likely to attempt to do so than those not advised (Sciamanna *et al.*, 2000; Kreuter *et al.*, 2000). The programme did not target GPs as the main provider of the intervention because of the many perceived barriers for their involvement in lifestyle interventions (Hiddink *et al.*, 1995; Kushner, 1995; Helman, 1997; Steptoe & Doherty, 1999). Furthermore, the results of our initial audit revealed that while 83% of GPs would raise weight as an issue with an obese patient, only 15% reported spending 1–10 min discussing weight management with patients (Counterweight Project Team, 2004). Based on these data, it was felt that the majority of GPs would resist more intensive involvement.

Practice nurse upskilling

Practice nurses play a key role in the delivery of lifestyle intervention in primary care at present, and were identified as the most appropriate professionals to deliver a weight management programme to patients. Our audit showed that the majority of PNs (76%) reported already spending 1–10 min discussing weight-related issues with obese patients. Participating practices agreed to restructure clinical work to be in a position to deliver the model as part of routine clinical care (Counterweight Project Team, 2004).

Core competencies were developed and used to design a 6–8 h training programme for PNs (Table 2). Training focused on using a structured approach to care and topics covered included patient screening and assessment, principles of healthy eating and energy balance, dietary approaches to weight management, physical activity guidelines, behaviour change strategies, pharmacotherapy, patient monitoring and ethical considerations. Training manuals were provided to support formal workshops. Guidance was also provided on the use of Counterweight Programme patient education materials. A variety of teaching methods were used, including problem based learning through case studies, group discussion and practical exercises in line with adult learning theory (Albanese & Mitchell, 1993).

The WMA then worked with the PN in clinical practice once or twice a month to co-facilitate

Table 2 Practice Nurse core competencies for weight management

<p>(I) Screening competencies To be able to appropriately screen patients for the Counterweight Intervention Programme and carry out measurements for monitoring purposes you should be able to:</p> <ul style="list-style-type: none"> (a) Demonstrate the correct method for Height, weight and waist measurement (b) Calculate a BMI and categorise the patient into the appropriate category for obesity (c) Administer a Dieting Readiness Test to assess a patients suitability for the Counterweight Intervention Programme (d) Identify patients requiring specialist input and follow appropriate protocol for such cases <p>(II) Assessment competencies To determine appropriate intervention for patients you should be able to:</p> <ul style="list-style-type: none"> (a) Assess factors affecting choice of intervention, e.g. group v individual (b) Determine patient expectations and level of commitment (c) Explain the theory behind 12-week interventions (d) Explain some key matters which may prevent a patient from being able to make change (e) List the pros and cons of different methods of dietary assessment available to them (f) Demonstrate the use of at least one method of dietary assessment and show alternative ways of dietary assessment if the method chosen initially is unsuitable (g) Ask appropriate questions about job, activities of daily living and leisure activities to assess energy expenditure <p>(III) Weight management competencies To ensure weight management intervention is based on current recommendations and (where possible) is evidence based, you should be able to:</p> <ul style="list-style-type: none"> (a) Demonstrate knowledge of the principles of The Balance of Good Health (b) List and explain the reasons for weight gain including the Gluttony versus Sloth debate (c) Explain the principles of weight loss (d) List the benefits of moderate 5–10% weight reduction (e) Give realistic targets based on recommended rates of weight loss (f) Explain the factors resulting in weight plateau (g) Explain the basis of the need for permanent lifestyle change rather than ‘going on a diet’ <p>(IV) Treatment competencies To be able to provide optimal weight management intervention within your practice you should be able to:</p> <ul style="list-style-type: none"> (a) Demonstrate in the initial interview, a clear system of negotiating the number and duration of sessions available to the patient to assist them in weight management (b) Demonstrate the negotiation of SMART goals with the patients for dietary change (c) Demonstrate the correct selection of and education on the resources for individual patients, showing flexibility of approach if the patient has problems understanding the information <p>(V) Follow-up competencies To ensure seamless management of obese patients you should be able to:</p> <ul style="list-style-type: none"> (a) Discuss with the patient the previously set goals, and elicit information as to what extent the patient has managed to make change. If the patient has failed to achieve change, appropriate questions are asked determine why (b) Explain the difference between lapse and relapse (c) Explain the use of the treatment algorithm and apply this to the treatment of patients 	<hr/> <p>clinics and patient groups. This involved the WMA demonstrating practical application of the model with patients and then continuing to provide support until the core competencies had been achieved. This practice-based learning approach has been shown to be effective in changing patient care (Ogrinc <i>et al.</i>, 2003). The use of the WMA as a role model in the clinical setting is consistent with social learning, innovation and social influence/power theories of learning (Table 1). After 6 months, practices generally required minimal support and WMA input after this time was</p>
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mainly for the purpose of data collection and training new PNs.

Intervention programme

Weight loss targets

The aim of the intervention programme is for patients to achieve a modest weight loss of 5–10% of initial body weight. This has been shown to reduce physical complications such as joint pain, as well as producing clinically meaningful reductions in blood pressure and blood lipid levels

(Reisin *et al.*, 1978; Tuck *et al.*, 1981; Rissanen *et al.*, 1985; Dattilo & Kris-Etherton, 1992; Goldstein, 1992; Van Gaal *et al.*, 1997). A modest weight loss of 5–10% has also been shown to reduce the risk of developing diabetes by 58% in at risk patients (Tuomilehto *et al.*, 2001; Diabetes Prevention Programme Research Group, 2002) and reduces overall risk of mortality by 20% (Lean *et al.*, 1990; Williamson *et al.*, 1995, 2000).

Screening and treatment pathways

Patient screening and treatment pathways were developed to provide a structured approach in the management of obese patients (Figs 2 and 3). This is in line with the second step of the EBQA model of setting evidence-based guidelines. Both the Counterweight screening and treatment pathways were consistent with national and international evidence-based guidelines for obesity (SIGN, 1996; NIH, 1998; RCP, 2003). The use of guidelines to change clinician behaviour stems from cognitive theory as well as management and systems theory (Table 1).

The Counterweight screening pathway prompts the clinician to consider stages of change (SoC). Transtheoretical model of behaviour change is used widely in health practice to assess the patients' willingness to make changes to their lifestyle (Prochaska & DiClemente, 1983; Prochaska *et al.*, 1992; Logue *et al.*, 2000). The use of SoC has been found to improve attendance rates for weight management and promote dietary change (Macqueen *et al.*, 2002; Molaison, 2002).

The screening tool prioritises patients with a BMI ≥ 30 kg/m² or BMI ≥ 28 kg/m² with co-morbidities for weight management. This higher risk approach was adopted based on the evidence that patients with existing obesity-related diseases such as CHD, diabetes and sleep apnoea are at very high absolute risk of mortality (NIH, 1998). The presence of CHD risk factors such as hypertension, dyslipidaemia, impaired glucose tolerance, family history of premature CHD, age 45 years and over for men and 55 years and over for women places the obese patient at higher risk (NIH, 1998). This approach was also more likely to be acceptable as primary care practitioners tend to target lifestyle advice to higher risk groups, given the limited consultation time (Little *et al.*, 1999; Lawlor *et al.*, 2000). In line with stepped models of care for obesity, it was envisaged that the Counterweight Programme would be part of a multi-strategy approach that would include the use of self-help and commercial programmes for patients at lower risk (Thomas, 1995).

The treatment pathway suggests that all patients should be offered a minimum of three months of lifestyle intervention as the first line approach, provided in individual or group format (Fig. 3). Practice nurses were encouraged to see patients for six appointments (10–30 min each), over a 3-month period for individual intervention or for six group sessions lasting 1 h each. Follow-up appointments were recommended quarterly for all patients. The use of a 3-month period of intensive

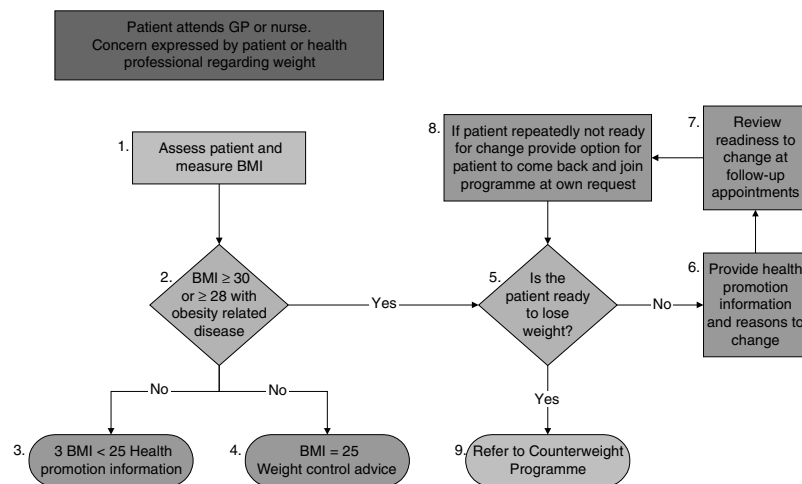


Figure 2 Counterweight screening pathway for weight management.

care (Tuomilehto *et al.*, 2001; Diabetes Prevention Programme Research Group, 2002).

Individual interventions. Individual intervention was encouraged when the group programme was not feasible in the practice or inappropriate for the patient. The two types of individual interventions used were goal-setting approach or a structured prescribed eating plan approach based on 500–600-kcal energy deficit. These were designed to be used independently based on the needs and preferences of the patient.

Goal setting is based on the PN and patient working together to mutually agree goals for dietary and lifestyle change. Once initial goals have been achieved, the clinician encourages the patient to set further goals, with the aim of making small but permanent changes in lifestyle. Goal-setting theory is widely used in promoting changes in health behaviours and has been shown to be effective in adopting dietary and lifestyle change (Strecher *et al.*, 1995; Cullen *et al.*, 2001; Schnoll & Zimmerman, 2001). Practice nurses were coached in the skills of negotiating goals to change lifestyle, as collaborative goal setting has been found to be more effective in weight management than health professional-selected goals (Alexy, 1985). A goals booklet was devised to prompt the patient and PN to set goals that were specific, measurable, achievable, realistic and time specific (SMART).

The prescribed eating plan (PEP) is an individualized food portion plan based on a 500–600-kcal deficit, with approximately 30% energy from fat. Recommended energy intake was calculated on the basis of the Schofield equation with 500–600 kcal deducted to create the energy deficit. Practice nurses were provided with a table to select the appropriate calorie amount depending on the patient's age, gender, weight and activity level. Another table detailed the number of portions of each food group corresponding to the calorie level calculated. The appropriate number of portions could then be written into a patient education booklet detailing exchange lists for each food group to promote dietary variety. The use of 600-kcal energy deficit approach is supported by SIGN (1996) and has been found to be more effective in promoting compliance and weight loss than set calorie diets (Frost *et al.*, 1991; Leslie *et al.*, 2002).

Group intervention. A group programme has been developed and is offered to practices as a first line treatment option if appropriate facilities are available. The programme is based around six one hour sessions run bi-weekly for a three month period. Sessions include discussions on weight loss targets, healthy eating, shopping, cooking, eating out, physical activity and relapse prevention. Each group aims to recruit 10–15 participants and sessions are based around the principles of adult learning, designed to encourage group interaction and active learning. Session plans, and teaching materials are provided to practices and the WMA typically facilitates the first patient group over three months with the PN observing. Following this the PN(s) is encouraged to take responsibility for facilitating the group.

There is some evidence to suggest that group therapy may provide better weight loss outcomes than individual therapy, although this is not conclusive (Jeffrey *et al.*, 1983; Hakala *et al.*, 1993; Ayyad & Andersen, 2000; Renjilian *et al.*, 2001). The group approach was deemed appropriate as it also offers practices in a cost-effective way of addressing patient numbers, and some clinical staff have experience in running groups from smoking cessation and other initiatives.

Physical activity. Goals to increase physical activity were incorporated into the individual interventions and the group programme. Patients were encouraged to aim for 30 min of moderate physical activity on most days of the week in line with current recommendations for health improvement (DOH, 1995; Harland & White, 1999). Guidance around gradually increasing physical activity levels was provided, given the poor baseline fitness of many obese individuals. Goals were based around incorporating activity into daily living, e.g. 'try to park the car a 15-min walk from work at least three times a week'. Referral to existing local exercise schemes was encouraged as part of the programme, if available and appropriate. These schemes were typically subsidised leisure centre-based exercise induction courses of 10–12 weeks duration. The evidence for the long-term effectiveness of exercise referral schemes is not conclusive (Hillsdon, 1998). Given the large number

of these schemes operating in the UK, incorporation and evaluation of this approach as part of a primary care weight management model is important (Fox *et al.*, 1997).

Incorporation of physical activity into weight-management programmes is widely recommended (NIH, 1998; SIGN, 1996) and is associated with long-term weight maintenance and CHD risk reduction (Pate *et al.*, 1995; Zachwieja, 1996). Physical activity counselling in general practice has also been found to be effective in promoting increased activity and improvement in quality of life (Elley *et al.*, 2003).

Behavioural approaches. The use of behaviour modification techniques is a core component of the Counterweight model. A number of behavioural strategies were incorporated into individual intervention and the group programme (Table 3). Evidence suggests that compliance to lifestyle change is improved with the use of behaviour change strategies (Wing, 1992; NIH, 1998). An approach which incorporates the nutrition knowledge and a behavioural approach may be more effective than providing health messages alone (Steptoe & Doherty, 1999; Anderson, 2000; Siero *et al.*, 2000).

Pharmacotherapy. Orlistat (Xenical, Roche Products Ltd, Welwyn Garden City, UK) and sibutramine (Reductil, Abbott UK, Queensborough, UK)

have both been shown to be cost-effective treatments for obesity if used in conjunction with lifestyle modification programmes (NICE, 2001a,b). Consistent with national guidelines, the Counterweight treatment pathway encourages at least a 3-month lifestyle intervention prior to considering the use of pharmacotherapy (Fig. 3) (RCP, 2003). General practitioners and PNs were provided with the prescribing and NICE guidelines for the two agents. All patients who received pharmacological intervention in the Counterweight Programme are provided with patient information booklets to explain the drug mode of action and to advise on concurrent lifestyle changes. Practice nurses and GPs were educated about commercially sponsored support programmes for these drugs and encouraged to recommend these to patients.

Orlistat is a locally acting gastrointestinal lipase inhibitor that reduces the absorption of dietary fat by about 30%. When orlistat is used in conjunction with a mildly hypocaloric diet in randomized, placebo-controlled trials, significantly greater weight loss is achieved at 1 and 2 years than with placebo and diet. Patients treated with orlistat also had significantly greater improvements in cardiovascular risk factors such as total serum cholesterol, low-density lipoprotein (LDL)-cholesterol, fasting glucose, fasting insulin and blood pressure (Sjostrom *et al.*, 1998). A 4-year double-blind,

Table 3 Behaviour modification techniques incorporated into the Counterweight Programme

Behavioural approach	Counterweight strategy
Self-monitoring	<ul style="list-style-type: none"> • Daily living diary used to record time of eating, type and amount of food, thoughts and feelings well as any physical activity
Stimulus control	<ul style="list-style-type: none"> • Personalised 5–10% weight loss targets, weight-monitoring charts • Identify external and internal triggers to eating using patient work booklet • Negotiate goals, e.g. 'try not to keep tempting food in the house'; 'if you eat when worried or stressed, make a list of relaxing activities to do instead of eating'; 'try to reduce portion sizes by using a smaller plate'
Eating behaviour	<ul style="list-style-type: none"> • Negotiate goals, e.g. 'try to avoid watching TV or reading while eating'; 'try to take a minimum of 20 min to eat a meal'
Cognitive restructuring	<ul style="list-style-type: none"> • Realistic weight loss expectations of 5–10% discussed at first appointment • Reasonable dietary and activity goals set in collaboration with the patient • Patient encouraged to challenge self-defeating thoughts with positive thoughts • Patient discouraged from using imperatives such as 'Always', 'Never'
Nutrition education	<ul style="list-style-type: none"> • Patient taught how to read food labels • Dietary goals set in line with the Balance of Good Health
Relapse management	<ul style="list-style-type: none"> • Patient encouraged to plan in advance how to prevent lapses • Management of cravings discussed • Patient encouraged to generate a list of coping strategies in high-risk situations

prospective study demonstrated the effect of orlistat and lifestyle change in reducing the incidence of type 2 diabetes compared with placebo (Torgerson *et al.*, 2004).

Sibutramine is a tertiary amine that has been shown to induce dose-dependant weight loss and to enhance the effects of a low-calorie diet for up to a year. Sibutramine inhibits the neural reuptake of serotonin and noradrenaline at the receptor sites that affect food intake, promoting satiety. It has been found to have a dual effect of preventing the decline in metabolic rate that normally accompanies weight loss (Hansen *et al.*, 1999). A 2-year randomized double-blind trial demonstrated the benefit of sibutramine in maintaining weight loss over a 2-year period (James *et al.*, 2000). Sibutramine has also been shown to improve glycaemic control and other metabolic parameters in patients with type 2 diabetes and impaired glucose tolerance (Fujioka *et al.*, 2000; Tambascia *et al.*, 2003).

Weight maintenance. Weight maintenance is encouraged once patients have achieved 10% weight loss or more or where weight maintenance is considered the preferred goal, e.g. if a patient has recently stopped smoking. Relapse prevention is discussed and weight check appointments offered at least quarterly. Evidence suggests that use of relapse prevention techniques and continued therapist contact can improve maintenance of weight loss (Baum *et al.*, 1991). General practice also provides an ideal setting for follow up, as obese patients routinely attend the practice for reasons other than weight management.

Patient education materials. An integrated package of patient education materials was developed to support the interventions, covering a wide range of topics from healthy eating and low-fat snacks to physical activity and behaviour change. The materials have a reading age of 12 years or less, and are designed to be used selectively and when appropriate. The initial audit and needs assessment revealed that only 36% of consulting rooms had weight management literature accessible and over 40% of these materials were from the pharmaceutical industry or popular press (Counterweight Project Team, 2004). Given the limited availability of materials and uncertain

quality, the development of new non commercial and professionally designed patient resources was deemed appropriate. The usefulness of the Counterweight materials will be evaluated by both clinicians and patients using qualitative research methods.

Practice incentives

A key role for the WMA was to support the GPs and PNs to implement Counterweight within routine care. Practices who volunteered to join the Counterweight programme acknowledged time and resources currently spent managing obesity and its consequences. No additional funding was provided for clinician time. The rationale for this was to evaluate what was possible to achieve within existing resources, and to assess a model which had the potential to be sustainable in the primary care setting. Practices were incentivized through audit feedback, the provision of training and free patient education materials. Furthermore, the NSF for CHD and diabetes require practices to have a structure in place for weight management, thus participation in the Counterweight programme fulfilled this requirement. The use of NSFs to promote change in clinician practice is in line with economic, power and learning theories (Table 1). Inclusion of weight management in GP contracts may be necessary however to promote wider involvement of primary care in managing obese patients.

Evaluation

The final phase of the Counterweight programme is evaluation. This involved measuring practice performance and patient outcomes in order to inform and improve future practise (steps three and four of the EBQA model of enhanced clinical care). A minimum patient data set was devised and included baseline weight, waist circumference, blood pressure, fasting lipids, glucose and HbA1c (diabetes only). These measures were to be repeated quarterly for 2 years with the exception of fasting blood values which would be repeated at 12 months for all patients and more frequently if clinically indicated. The WMA

worked with the practice to devise strategies to facilitate data collection including patient recall letters and adding reminders to computerized patient records.

Patient record cards were anonymized and copied every 6 months and then analysed to generate practice reports. These reports detailed patient characteristics, mean changes in weight and secondary end points at 3, 6 and 12 months. Aggregate data was also presented for participating practices in the region and nationally. The WMA met with the practice to feedback these data and to discuss any strategies to improve patient outcomes. The use of audit feedback has been found to improve clinical practice through marketing, behavioural and organizational approaches (Table 1; Smith, 2000).

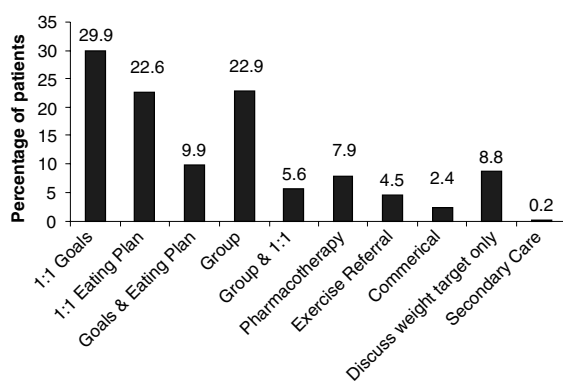


Figure 4 Weight management interventions for patients recruited to the Counterweight Programme.

Results

As of February 2004, 58 of the 62 (93.5%) intervention practices had been trained and 47 (75.8%) practices were continuing to actively recruit patients into the programme. Four (6.5%) practices withdrew prior to training, and 11 (17.7%) practices have stopped recruiting patients. The main reasons for practice withdrawal given have been a lack of resources and time and as well as staff retention issues. A total of 1256 patients had been recruited as of September 2003. At baseline 75% had at least one obesity-related co-morbidity, with 14% of patients having diabetes, 33% with hypertension, 14% having dyslipidaemia and 9% with CHD or angina. At point of entry into the programme the mean BMI was 36.9 kg m⁻² (SD 5.4) with 25% having a BMI >40 kg m⁻² (classified as severely obese). Mean age at entry of 50.6 years (SD 14).

The majority of patients (62.4%) received individual intervention during the first 12 months, with less than one-third of patients attending the group programme (Fig. 4). Goal setting was more popular than the prescribed eating plan for individual intervention, although around one in 10 patients received both. In accordance with the treatment pathway, 91% of patients received one of the core lifestyle interventions of goal setting, prescribed eating plan or the group programme.

Anti-obesity medication was prescribed to 7.9% of patients during the first 12 months. Almost all patients receiving pharmacotherapy (94%) were also provided with one of the core lifestyle

Table 4 Indicative weight change results for the Counterweight Programme

	Total (n)	Mean weight change – all patients	Weight change – fully compliant*	% with >5% weight loss** from baseline – all patients	% with >5% weight loss** from baseline – fully compliant*
Patients recruited by Sept 2003	1256				
Patients reaching 3 months	1090	–	–	13.9	15.3
Patients with data at 3 months	599	–3.4 kg	–3.7 kg	25.3	28.0
Patients reaching 6 months	904	–	–	17.3	18.9
Patients with data at 6 months	388	–4.3 kg	–4.7 kg	40.2	44.0
Patients reaching 12 months	684	–	–	13.9	17.6
Patients with data at 12 months	282	–3.2 kg	–4.7 kg	33.7	42.7

*Fully compliant being those patients who attended a minimum of four appointments in the first 3 months, five appointments in the first 6 months OR six appointments in the first 12 months.

**5% weight loss is the amount shown to prevent 58% of new diabetes (Tuomilehto *et al.*, 2001; Diabetes Prevention Programme Research Group, 2002).

interventions in accordance with the treatment pathway. A small percentage of patients were referred to a local exercise scheme or attended a commercial group outside of the practice. Only three patients were referred to a specialist secondary care centre (Fig. 4). A total of 8.8% of patients opted to lose weight on their own after discussing a weight loss target with the PN, returning only for follow-up measures. Some patients had more than one intervention over the 12-month period.

Definitive results will not be available until study completion in 2005. Indicative results are available for weight change in the subjects who have completed 3, 6 and 12 months (Table 4). These data show positive outcomes with the Counterweight Programme with one-third of all patients followed up showing clinically beneficial levels of weight loss at 12 months. When outcomes for patients fully complying with the programme are examined the figure is even more encouraging at 42.7%. A total of 51% of patients were classed as compliant in that they attended the required level of appointments in 3, 6, and 12 months to receive the Counterweight intervention. This was defined as attending four or more appointments in 3 months, five or more appointments in 6 months or six or more appointments in 12 months.

Discussion

The Counterweight Programme is an evidence-based model to improve obesity management in the primary care setting. Preliminary results indicate that the uptake of the programme into primary care has been well received, with three quarters of practices continuing to recruit patients despite no additional funding being provided. Practices have been successful in implementing a structured approach to care with over 90% of patients receiving one of the core Counterweight interventions of individual or group therapy and over a third of all patients followed up achieving a 5% weight loss or more at 12 months. While practices are self-selected with an interest in obesity and may not be representative, there is a wide cross-section of practices participating including large practices, single-handed GP practices, rural and urban, high and low deprivation areas.

The programme is unique as it targets changes in clinician behaviour and practice systems to facilitate the implementation of a structured pathway for obesity management using evidence-based interventions. In contrast, other interventions that have failed to improve patient care have primarily focused on limited clinician upskilling without the use of other strategies to promote changes in clinician behaviour (Moore *et al.*, 2003). To facilitate changes in clinical practice an evidence-based multi-faceted approach targeting key barriers to change is required (Grimshaw *et al.*, 2001). The Counterweight programme incorporates these principles and provides a best practice model to improve the management of obese patients in primary care.

Results to date indicate that practices are successfully implementing the treatment model with over 90% of patients receiving one of the core lifestyle approaches, and over 50% of the patients completing the required number appointments. These compliant patients have a greater mean weight loss and are more likely to achieve a clinical significant weight loss of 5% or more compared with noncompliant patients. It has to be recognized that not all patients are appropriate for intensive management and more rigorous patient screening using the stages of change model may improve patient selection. Strategies to improve patient attendance and compliance may improve future weight loss outcomes in primary care.

Most practices chose to provide individual intervention rather than running the group programme. Patients seen on a one to one basis were typically recruited opportunistically and seen as part of existing clinics. Lack of appropriate facilities to run groups in practices resulted in group intervention not being possible in all practices. The small number of patients opting to lose weight on their own or attend a commercial programme indicates that not all patients wish to have weight management issues addressed at the GP practice.

While a small percentage of patients were prescribed anti-obesity medication as a first-line treatment, this may reflect the multiple unsuccessful attempts to lose weight previously. It was encouraging that almost all patients receiving pharmacotherapy also received individual or

group intervention to promote lifestyle changes. This was in accordance with the Counterweight treatment pathway. The very small number of patients referred to secondary care was surprising given the high mean BMI and level of obesity-related co-morbidities. This may reflect the poor availability of specialist obesity services and/or long waiting times. The use of a structured approach to obesity management in primary care may also reduce the number of patients referred to secondary care.

The model has been designed to complement and standardise lifestyle approaches already used in practices, and it was hoped that this could be incorporated into standard care, particularly for patients with diabetes and cardiovascular disease. With the pressures on already stretched PN and GP time, it seems likely that additional funding will be needed to take on obesity management, as has been done for smoking cessation. While a lack of resources and time, as well as changes in clinical staff are the main reasons given for practice withdrawal, a qualitative study is currently underway to explore the factors which have influenced practice and patient uptake of the programme. These findings will be important for the wider implementation of the Counterweight model into primary care in the future.

Three quarters of patients recruited had at least one obesity-related co-morbidity at baseline. It is important to note that co-morbidity recording was based on coding within the primary care medical notes, rather than on initial baseline measures. Hence this may underestimate the number of patients with conditions such as hypertension and dyslipidaemia due to the poor coding of these conditions in primary care registers.

Given that around one quarter of patients enlisted were morbidly obese, with a high prevalence of obesity-related disease, it seems that the Counterweight model is mainly being used in an attempt to manage diseases which have developed secondary to obesity. This is not surprising given the NSF for CHD (DOH, 2000) and diabetes (DOH, 2001) both emphasize the importance of lifestyle change. It may also be a reflection of the time pressures on practices to implement the programme within existing resources, thus offering

obesity management to their most needy patients with existing medical conditions.

There is good evidence that moderate weight loss of 3 or 4 kg (5%) can significantly reduce the risk of developing type 2 diabetes (Tuomilehto *et al.*, 2001; Diabetes Prevention Programme Research Group, 2002). Obesity management is also central to the prevention of CHD and cancer, the two main causes of death in the UK (Calle *et al.*, 2003). From a prevention perspective, weight management strategies need to be initiated. Given that 20% of the average practice population is obese, there is a limit to the number of patients primary care can manage intensively. If the indicative results of the Counterweight model can be sustained, the programme could be part of a wider strategy to reduce and effectively manage obesity in the community.

Conclusion

The Counterweight Programme provides a new model for obesity management in primary care, and was designed to be used as part of a multi-strategy approach to managing obesity in the community. The model draws on theory and evidence for changing clinical practise as well as evidence based interventions for obesity management. Preliminary indicative results show that implementation of a structured model for weight management is feasible and effective in the primary care setting. It is envisaged that patient recruitment will continue until the end of 2004 to ensure sufficient follow-up data, with dissemination of findings in 2005. The programme will provide an evidence base for effectiveness of various obesity treatment models on long-term patient outcomes in primary care, and will have piloted patient education resources and a clinician training programme for dissemination and use nationally.

Acknowledgments

We are grateful to the participating practices for their enthusiasm and co-operation. The Counterweight Project was funded by an Educational grant-in-aid to the Project Board from Roche Products Ltd. Thanks go to Dr J. Wilding and Prof. A. Barnett who participated

in the initial discussions that led to the Counterweight Programme and to Mr A. Basar for participation during the early stages of the programme.

Contributors

The WMAs contributed to study design and conducted the audit, co-ordinated by HR. The principle investigators in each centre are members of the project board and designed the study. RL collated and analysed the data and wrote the first draft of this paper. All authors reviewed and contributed to the final manuscript.

Funding

Educational grant-in-aid from Roche Products Ltd. Intellectual property rights reside with the Counterweight Project Team.

Competing interest

HDG³, JB^{2,3}, RAL³, JPDR^{1,3}, PN³, SK^{1,2,3}, ELMcC³, MEJL^{1,2,3,4}, GFL³, GSF⁵, MSQ³, JHB^{1,2,3,4}, SMH³, NF^{1,2,3,4,5}, HMR^{3,6} declare potential competing interests, where, ¹acted as consultants, ²have received lecture honoraria, ³have attended national/international meetings as guests of Roche Products Ltd, ⁴involvement as above with other pharmaceutical companies with an interest in obesity, ⁵research grant, ⁶HMR is employed by Roche Products Ltd, but reports to the Counterweight Project Board.

Appendix 1

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