2. OPPORTUNISTIC IDENTIFICATION AND LIFESTYLE/EXERCISE ADVICE ON REFERRAL IN PRIMARY CARE SETTINGS FOR PRIMARY PREVENTION OF OBESITY

Evidence of efficacy for weight management/reduction

Nine RCTs reported weight or body composition outcomes, of which three looked at general health advice, one looked at diet interventions alone, and five looked at PA interventions alone. One systematic review looked at exercise training programmes, some of which included diet, in early postmenopausal women.

The results suggest that interventions that provide general advice, addressing both diet and activity, are more likely to prevent unhealthy weight gain than those focusing on diet or activity alone. Of those focusing on PA alone, a more positive outcome was found when interventions were delivered by facilitators from more than one discipline.

General health advice/screening – diet and activity

Three UK based RCTs (Imperial Cancer Research Fund (ICRF) 1994, 1995; Family Heart Study Group (FHSG) 1994**)** were identified with the intensity of intervention based on participants risk score. One RCT (ICRF 1994) found no effect on BMI at 1 year, but a 1.4% reduction in BMI in the intervention group compared with the control at 3 years ($p < 0.005$) (ICRF 1995). The two RCTs from the same study had different control groups. FHSG (1994) reported that the weight of the intervention group was lower by an average 1 kg compared with controls and the proportion of patients with high BMI (≥30 kg/m^2) were lower in intervention than control (no significance values stated). Both interventions were delivered by nurses.

Diet alone

The health check and diet-only RCT (John 2002) reported no difference in weight loss between intervention and control groups ($p = 0.68$) at 6 months.

Physical activity alone

Five RCTs (Taylor 1998; Halbert 2000; Lamb 2002; Elley 2005; Tully 2005) reported weight outcomes in PA interventions. Three RCTs consisted of serially reinforced advice/motivation by telephone after an initial consultation/advice session (Halbert 2000; Lamb 2002; Elley 2005). One study in the UK encouraged intervention participants to attend 'health walks' (Lamb 2002), one study in New Zealand looked at a general practitioner (GP) intervention for sedentary 40–79 year-olds and one study in Australia looked at an exercise specialist intervention in a population of older adults (≥60 years; Halbert 2000). Two RCTs looked at exercise advice or prescription alone, both in the UK. One advised non-supervised walking for healthy sedentary people aged 50–65 years (Tully 2005) and one looked at GP exercise referral to a leisure centre for 40–70-year-olds, the majority of whom were overweight or obese (Taylor 1998).

None of the five RCTs showed a significant effect for weight loss at follow-up (of up to 37 weeks depending on study) although positive trends were noted in two studies (Elley, Taylor), one showing a reduction in skinfold thicknesses up to 16 weeks (Taylor). One study (Halbert) showed a significant weight gain in women in the intervention group ($p = 0.01$). Two of the interventions were delivered by facilitators from more than one discipline (Elley: GP/practice nurse and exercise specialist; Lamb: physiotherapist and local health walks coordinator), two were delivered by an exercise specialist alone (Halbert, Taylor) and one was unsupervised (Tully).

The systematic review of exercise training in early postmenopausal women (Asikainen 2004), where some of the interventions were combined with diet, found an improved body composition in 9 of 18 studies. The best effect was in the three studies of overweight women that combined training and diet, but six of the studies with positive results included some women within the normal weight range.

Evidence of efficacy for diet outcomes
One systematic review and four more recent RCTs provide some evidence that interventions can result in changes to dietary intake.

A systematic review (Ashenden 1997; ten studies with diet outcomes, all randomised) reported that dietary advice trials were very mixed in interventions employed and study populations. Of four trials directly assessing dietary change by collecting data on fat and fibre intake, one found very positive results, one found no significant difference on either measure and two found significant differences for one measure but not the other.

Four RCTs published since the systematic review were identified. With the exception of one (Steptoe) the RCTs had predominantly white samples, two were UK-based (Steptoe, John) with one based in a low-income area (Steptoe). Two studies gave dietary advice by physicians in routine consultations (Delichatsios, Beresford), and two were provided by research nurses (Steptoe, John). Three of the RCTs (Delichatsios 2001; John 2002; Steptoe 2003) reported that individually tailored intervention resulted in increases in self-reported fruit and vegetable intake between 3 months (Delichastsios), 6 months (John) and 12 months (Steptoe) between 0.6 portion per day (Delichatsios) to 1.4 portions per day (John) compared with control groups. Steptoe reported increased consumption (at 12 months) in both a nutrition advice and tailored behaviour intervention, but stated significantly higher intake in the tailored behaviour intervention (0.6 portions per day, $p = 0.021$). Beresford (1997) measured changes in fat intake, which were significantly larger at 3 and 12 months in the intervention group.

Evidence of efficacy for physical activity outcomes
Three systematic reviews (Eakin 2000; Eden 2002; Morgan 2005), all retained because of the limited overlap, and including four UK RCTs (Stevens 1998; Taylor 1998; Harland 1999; Lamb 2002), plus one more recent study from New Zealand (Elley 2005), provide some evidence that primary care-based interventions can increase PA levels.

One systematic review concluded that counselling adults in a primary care setting is moderately effective in the short term (Eakin 2000), and one that evidence was ‘inconclusive’ (Eden 2002). Interventions tailored to the participant characteristics and which offered written materials to patients produced stronger results. The most recent systematic review (Morgan 2005) concluded that exercise referral schemes appear to increase PA levels in certain populations, namely those that are not sedentary but already slightly active, older adults and those who are overweight but not obese.

The systematic reviews were unpicked to look at the four UK studies in more detail. One UK RCT which gave physiotherapist run advice sessions to sedentary 40–70-year-olds and encouraged the intervention group to participate in lay led walking schemes reported no significant between group differences in self-reported PA at 12 months and no effect on weight loss (see above). However, when only completers were analysed, the intervention was more effective than advice only (Lamb 2002). Taylor (1998) was an exercise referral scheme intervention with weight outcomes only, discussed above. Harland (1999) was an incentives study (see Table 3) offering vouchers entitling free access to leisure facilities. Increased PA scores were reported at 12 weeks, but this increase was

not maintained in the long term (12 months). Stevens (1998) provided a consultation followed by a personalised 10-week programme to sedentary 45–70-year-olds. There was a significant net 10.6% reduction in the proportion of people classed as sedentary in the intervention compared with the control group at 8-months follow-up.

The recent New Zealand-based RCT of oral and written advice from GPs or practice nurses plus motivational phone calls by an exercise specialist reported a significant difference between intervention and control including the proportion undertaking 2.5 hours exercise per week ($p = 0.003$) at 12 months (Elley 2005).

Evidence of corroboration in the UK

Two systematic reviews, seven qualitative studies, two RCTs (one suspended), four cross-sectional surveys, one evaluation and survey and one evaluation of case studies provided evidence of UK corroboration.

Barriers to change

A systematic review (Keller 1999) found that that individual perceptions of self-efficacy ('I believe I can exercise regularly') are important and strongly related to exercise behaviour and that clinicians can help facilitate these perceptions. Four additional studies (Horsefall Turner/Wealden District Council 1997; Martin 1999; See Tai 1999; Hardcastle 2001) where participants had been referred to an exercise prescription at a leisure centre revealed a variety of barriers to adherence. These included the importance of social support (all), time (Martin; See Tai; Horsefall Turner) the gym environment and time spent with instructors (Hardcastle, Martin and Horsefall Turner). Other barriers were illness and injury, work pressure, transport, programs not appropriately tailored, lack of money. Knowing where facilities are at the start of the programme increased likelihood of completing a programme by 3.5 times ($p = 0.043$) (See Tai 1999). A qualitative study of guided walks (Ashley 1999) found that *Health Walks* were a sustainable form of exercise, but planning and promotion activities should take into account the seasons and varying needs of walkers (grades of difficulty, evening walks for workers, etc.) as well as emphasising the social benefits.

Data from two RCTs where the intervention was delivered by nurses (Baron 1990; John 2004) reported patients' barriers to healthy eating included partners and children disliking recommendations and the difficulty of preparation and finding food outside of the home. Only 10% and 8% respectively reported these barriers in the Baron study, but 37 of 40 people reported at least one barrier in John.

Patients' views of health professional advice

One cross-sectional survey of mainly white, UK patients (Duaso 2002) suggested that significantly more respondents would have liked to have received advice than did ($p < 0.001$). Women found the advice more helpful than men ($p < 0.05$). Hardcastle (2001) demonstrated the importance of encouragement from GPs in promoting PA in addition to participant commitment and confidence. However, a cross-sectional survey (Vernon 1998) on the effectiveness of walking packs found that the major barrier was lack of time (60%) rather than motivation by a GP or health professional (14%). A small qualitative study (Fuller 2003) found that couples viewed general practice as a place for treatment of illness and disease rather than provision of dietary advice. Health was only one of many factors influencing their daily decisions about food and they were concerned about contradictory messages.

Attendance at UK exercise referral schemes

A systematic review of four RCTs and five evaluation studies of UK exercise referral schemes (Gidlow 2005) found that attendance was generally poor. Approximately 80% of participants who took up referral dropped out before the end of the programme. More women than men took up referral (60 vs. 40%) but there was no evidence of higher attendance in women.

Health professionals in primary care
Activity: One evaluation of case studies of PA promotion schemes in primary care (Biddle 1994) revealed that success depends on the qualities of key personnel in contact with participants and establishing a programme depends on the enterprise of an energetic innovator. A qualitative study (Smith 1996) reported that referring practice members saw exercise promotion as a therapeutic as opposed to a preventive option and tight referral criteria was a barrier. Data from a suspended RCT (Fielder 1995) found that barriers to recruiting patients to a GP-led programme included time, overly complicated questionnaires and lack of financial incentive for the health professionals.
Diet: A qualitative study by Fuller (2003) reported that GPs viewed general practice setting as a place for treatment of illness and disease, and their advice was affected by personal preference (younger, females doctors being more enthusiastic). GPs were concerned that dietary advice could damage their relationship with patients. Hopper (1995) reported that practice nurses gave dietary advice more frequently than GPs. Time was the main barrier for GPs to training and offering dietary advice. The primary health care workers surveyed felt that their practice population was not sufficiently motivated to follow dietary advice.

Community pharmacies
Six qualitative studies, two of pharmacy contractors/advisors (Keene 1995; Ursell 1999) and four of community pharmacists (Benson 1995; Moore 1995; Ursell 1999; Coggans 2000) cited time, confidential space, training issues and cost issues (including loss of revenue) as barriers to increasing health promotion. Two of the studies (Benson 1995; Coggans 2000) noted concerns that giving lifestyle advice was ‘interference’.

One qualitative study of consumers (Anderson 1998b) found that only 40% thought it was the usual job of the pharmacist to give health promotion advice although 92% said that they would pick up health information leaflets at the pharmacy. In another study (Coggans 2000) less than 32% reported that they would seek information or help on healthy eating and only 23% would seek help on exercise at the community pharmacy. Conclusions from a Delphi study of health professionals (Coggans 2000) were that factors that facilitate pharmacy staff/customer interaction should be addressed as well as enhancing perceptions of pharmacists as key players in the health care team who provide a confidential service.

EVIDENCE TABLE 2: OPPORTUNISTIC IDENTIFICATION AND LIFESTYLE/EXERCISE ADVICE ON REFERRAL IN PRIMARY CARE SETTINGS FOR PRIMARY PREVENTION OF OBESITY

First author	**Study design**	**Research type**	**Research quality**	**Study population**	**Research question** (include power calculation if available)	**Length of follow-up**	**Main results** (include effect size(s)/confidence intervals for each outcome if available)	**Confounders** (potential sources of bias)**/comments**
Evidence of efficacy (internal validity) for weight maintenance/reduction								
Asikainen 2004	Systematic review	1	++	Literature search 1996 – November 2002. Comprehensive search strategy but English language studies only included. Twenty-eight RCTs included, 18 of which had a weight or body fat outcome (1804 subjects in all); three of these were for overweight subjects and combined exercise and diet. Location of studies not described.	**Aim:** To evaluate data on exercise training studies with special reference to improving health in early postmenopausal women.	Duration range for weight loss studies was 12 weeks to 1 year.	Body composition was improved in 9 of 18 studies. The mean weight loss ranged from 2 to 10 kg in 12 weeks to 1 year (note: the best results were accomplished in the three studies with overweight participants that used training and diet). The most effective exercise prescription for losing body fat was 30–60 min of walking or other aerobic training at 45–75% VO_{2max} on 3–5 days per week for 15 weeks to 1 year, or strength training with weight machines twice per week for 1 year. In the training studies where participants were not overweight, adipose tissue was not lost as often as with overweight participants. The authors concluded that health professionals should recommend to sedentary women in early menopause who have fitness or weight concerns, a programme of at least 30 min of daily moderate walking in one to three bouts in addition to resistance exercises	Review found in update search: unpicking not possible within timeframe for completion but six of nine studies with positive outcomes included women within normal weight range. Few studies reported in detail how randomising was performed, if there were power calculations, if staff were blinded, ITT analyses. Some did not report drop out, attendance or injury rates.

							twice per week.	
Elley 2005	RCT Cluster	1	++	All sedentary 40–79-year-old patients visiting general practitioner during study period, in eastern Waikato region of New Zealand. *n* = 878 Mean age = 57.9 years 66.5% female 47% low economic status 28% with post-high school qualification 77% European origin	**Aim:** To assess long-term effectiveness of a clinician based initiative in general practice that provides counselling on PA. GPs and practice nurses prompted by patient to give oral and written advice on PA during usual consultations. Exercise specialist continued support by phone (three calls over 3 months). Control received usual care. **Power calculation:** Sample size of 800 patients from 40 practices (power = 90%). **Delivered by:** GPs/practice nurses and exercise specialist.	12 months	85% follow-up of enrolled patients at 12 months. Very slight BMI (kg/m^2) reduction in both groups but no significant difference between intervention and control for BMI reduction (–0.06 [95% CI –0.24, 0.12], p = 0.5).	In the intervention group 385 patients received intervention from general practitioner and 66 patients received intervention from practice nurse.
John 2002 UK Study	RCT Individual	1	++	Healthy participants aged 25–64 years recruited from a primary care health	**Aim:** To evaluate the effectiveness of a brief negotiation	6 months	95% follow-up in both groups. **No difference in weight loss between groups:**	Self-reported values are susceptible to reporting bias, so results should be interpreted with caution.

				centre, Thame, Oxfordshire, UK. *n* = 690 Mean age = 46 years 51% female 49% Social Class I and II 10% Social Class IV and V 'The general practices had few patients from ethnic minorities.'	method to encourage an increase in fruit and vegetables to at least five portions/day. Intervention group received health check followed by 25 min tailored dietary negotiation. Two-week reinforcing phone call and letter sent at 3 months. Control received intervention 6 months later. **Delivered by:** Trained research nurses.		Self-reported weight loss (kg) was 0.6 (SD 2.6) in both intervention and control groups. Adjusted between group difference in change* 0.1 (95% CI –0.4, 0.6), *p* = 0.68. *Adjusted for baseline value and sex.	Same study as John 2004.
Tully 2005	RCT Individual	1	+	Thirty-one healthy, sedentary 50–65-year-olds identified by searching the medical registers of three urban general practices in Belfast, UK**,** and subsequent selection by questionnaire. Overall recruitment rate = 5.9% (31/527).	**Aim:** To examine the effects of 30 min of self-paced, non-supervised, brisk walking, 5 days per week on the health and fitness of people aged 50–65 years. Intervention group (*n* = 21) instructed to walk briskly for 30 min, five days per week for	12 weeks. No longer-term follow-up.	81% completion and 90% adherence to protocol in intervention group. 90% completion in control group. The mean time spent walking by the intervention group was 27.72 ± 9.79 min/day. No significant changes were found in weight-related measures in either group.	No allocation concealment and no ITT although >80% completion. Participants likely to be highly motivated – overall recruitment rate = 5.9%. The authors noted that reported adherence was high suggesting greater acceptability of a pedometer-driven home-based model (vs. leisure centre exercise protocol).

				No socio-economic details provided.	12 weeks (all in one session or bouts of no less than 10 min). They were asked to record in a diary the time spent walking and the number of steps using a pedometer. Control group (*n* = 10) asked to maintain habitual lifestyle. No power calculation. Intervention delivered by higher education researchers.			
Lamb 2002 UK Study	RCT Individual	1	+	Men and women aged 40–70 years taking <120 min of moderate intensity activity per week. Reading, UK. *n* = 260 48.8% male Mean age = 50.5 (SD 7.8) years	**Aim:** To compare health walks, a community-based lay-led walking scheme versus advice only (from a primary health care professional) in middle-aged adults. Intervention and control took part in a 30 min standardised advice session led by a physiotherapist. Intervention given information about health walks and received up to three	6 months and 1 year	Loss to follow-up at 12 months was approximately 27% in each group. No statistically significant differences between people lost to follow-up and those who remained in the trial. No significant within-group changes from baseline in BMI at 12 months: –0.01 kg/m² reduction in advice group and –0.002 kg/m² reduction in Health walks group. Between group difference –0.009 (95% CI –0.39, 0.194).	Low follow-up, analysis by ITT. Related qualitative study below (Ashley).

					motivational phone calls from a local health walk coordinator. Control received no further intervention. Power calculation: Sample size of 100 people for each group (power = 90%). An additional 30% included to allow for loss to follow-up. **Delivered by:** Physiotherapist and local health walks coordinator.			
Halbert 2000	RCT Individual	1	++	Adults aged ≥60 years who were healthy, sedentary and living in the community. Adelaide, Australia. *n* = 299 Mean age = 67.5 years 46% Male	To determine whether provision of individualised PA advice by an exercise specialist in general practice, reinforced at 3 and 6 months, is effective in modifying PA, compared with no advice control. **Delivered by:** Exercise specialist.	12-month follow-up.	Follow-up of 88%. Over 12 months there were no statistically significant changes from baseline in body weight within either the control or intervention group. Weight decreased in men in the intervention and control groups and in women in the control group but increased in intervention group women (p = 0.01). (Values for gender not stated so unclear if significance value for intervention women only.) **Control group values:**	Generalisable to older adults only.

							Baseline = 74 (71.8–76.1) kg and 12 months = 73.6 (71.5–75.8) kg Intervention group values: Baseline = 75.9 (73.8–78) kg and 12 months = 76.0 (73.9–78.1) kg No between group difference stated. ***[ranges or 95%CI?]***	
Taylor 1998	RCT Individual	1	+	142 recruits from 345 men and women, aged 40–70 years and identified as smokers, hypertensive of overweight on medical records in East Sussex general practices. Circa 37% men. No socio-economic details provided.	**Aim:** To examine the effects of a GP exercise referral programme on modifiable coronary heart disease risk factors. The exercise group received a Health Education Authority leaflet on preventing coronary heart disease and was offered 20 half-price sessions over 10 weeks at a leisure centre. Patients engaged in moderate and vigorous aerobic activity in a semi-supervised informal environment. The control group received the leaflet but no further intervention.	Ten-week intervention. Outcomes measured at 0, 8, 16, 26 and 37 weeks.	41% (142) of the 345 invited to enter were randomised. 50% (71) provided data at all assessments, 41% of the exercise and 69% of the control group. 87% of those referred used the prescription and 28% (high adherers) (45% of obese patients) did at least 15 sessions. The exercise group reduced sum of skinfold thicknesses by 8.1 (95% CI 2.9, 13.3)% more than the control group, up to 16 weeks after baseline. High adherers (≥ sessions attended) reduced sum of skinfold thicknesses by 9.2 (95% CI 0.9, 17.5)% more than the control group up to 26 weeks.	Randomisation by random numbers but no allocation concealment. Assessments were not blinded. ITT analysis not carried out other than for the physical self-perception assessment. Baseline measures were broadly similar but there are more obese participants in the intervention group (30 vs. 18%) suggesting a potential weakness in randomisation. Overall there were 83% overweight or obese subjects in the intervention group and 71% overweight or obese subjects in the control group. Objective measures of weight and skinfold thickness. PA (Blair's)

					Intervention provided by higher education researchers. The assessment was by a postgraduate exercise scientist and the outcomes measured by a 'trained researcher'. A power calculation was based on a 4 mmHg blood pressure reduction.			and physical self-perception (PSPP) measures well referenced and probably validated. See also companion corroborative study, Taylor 2005
Imperial Cancer Research Fund 1995 UK Study	RCT Cluster	1	+	Patients aged 35–64 years in 1989 from five urban general practices. Bedfordshire, UK. *n* = 11090 Mean age = 49 years Area chosen for mixed urban and suburban setting, range of heavy and light industry and varied demographic profile.	**Aim:** To determine the effectiveness of health checks (risk factor counselling and negotiation of targets), performed by nurses in primary care, in reducing risk factors for cardiovascular disease and cancer. Control received health check at least 1 year later. Structured dietary assessment. No description of PA component. **Delivered by:** Nurses.	Three years (although mutually arranged (or structured for some risks) follow-up visits during this time, and some randomised to annual health checks).	Comparison of groups within the randomised population. Intervention was 2205 invited for re-examination in 1992–93 after an initial health check in 1989–90. Control group was 1916 randomly allocated an initial health check in 1992–93. Follow-up in control was 81.3% (1916 of 2783 randomised*) of those randomised. Follow-up in intervention was 82.2% (1160 of 2205 randomised*) of those who attended their first health check. *Excluding those who moved from the area. Dietary advice led to a small difference in BMI in intervention groups compared with controls but	Different levels of risk factor received different levels of intensity of intervention. Follow-up sessions for all patients at mutual agreement of nurse and subject. No allocation concealment. ITT analysis carried out.

							failed to reduce the proportion of the population with obesity. At follow-up, mean BMI was lower in intervention group than in control by 1.4% ($p < 0.005$).	
Imperial Cancer Research Fund 1994 UK Study	RCT Cluster	1	+	See above.	See above.	1 year (Although mutually arranged [or structured for some risks] follow-up visits during this time.)	Comparison of groups within the randomised population. Intervention was 2136 patients invited for re-examination in 1990–92 after an initial health check in 1989–90. Control was 3988 attending first check in 1990–92. Follow-up in control was 79.1% (1908 of 2760 randomised, excluding 348 who had moved). Follow-up in intervention was 77.8% of those who attended their first health check (1616 of 2136 randomised, excluding 60 who had moved [= 2076]) At 1 year, no significant difference between groups in BMI (kg/m^2): 0.16 (95% CI –0.06, 0.38). When analysis restricted to attendees a significant difference was found (1.2%) in BMI between intervention and control (significance not stated).	See above. Treated as separate study from above as different control group.
Family Heart	RCT Cluster	1	+	Male patients on GP lists aged 40–	**Aim:** To measure change	1 year	73% response rate to initial questionnaires	No description of randomisation process

Study Group 1994 UK study				59 years in 26 practices in 13 towns, and their partners, UK. *n* = 12472 59.8% male Mean age men = 51.5 years Mean age women = 49 years	in cardiovascular risk factors achievable in families over 1 year by a nurse-led cardiovascular screening and lifestyle intervention in general practice. Intervention received 1.5-hour screening and risk-related lifestyle advice. Internal and external controls received screening 1 year later. **Delivered by:** Nurses.	(Although intervention subjects followed up during this time according to risk score.)	At 1 year, 88% follow-up in intervention males, and 85% follow-up in intervention females. Non-returnees twice as likely to be smokers, more overweight than returnees and with a slightly lower prevalence of diagnosed disease. At 1 year, in the intervention group, weight among returnees was lower by an average 1 kg compared with the internal and external control groups (no significance stated). At 1 year, the proportion of patients with high BMI (≥30 kg/m^2) were lower in the intervention group than in controls (no significance stated).	and no allocation concealment. No ITT analysis re weight outcomes. Follow-up during year dependent on risk score. Substantially more subjects in external control than intervention and internal control. Little baseline data given.

Evidence of efficacy (internal validity) for diet outcomes								
Ashendon 1997	Systematic review	1	+	Literature search year of inception – May 1995. Thirty-seven randomised trials included in all. Ten to modify dietary behaviour.	**Aim:** To explore how effective lifestyle advice provided by GPs is in changing patient behaviour.	Range of follow-up, 3 months to 2 years in ten dietary advice trials.	The dietary advice trials were very mixed in interventions employed and study populations. Of four trials directly assessing dietary change by collecting data on fat and fibre intake only one found positive results, one found no significant difference on either measure and two found significant differences for one measure but not the other. Six trials measured changes in lipid levels (outcome not included in rapid review).	Literature search did not include unpublished trials – may introduce bias. Dietary advice: Logsdon 1989 Cupples 1994 Imperial Cancer Research Fund OXCHECK 1994 Baron 1990* Koopman 1990 Cohen 1991 Beresford 1992

								Campbell 1994 Family Heart Study Group 1994* Tomson 1995 *UK or Irish study
Delichatsios 2001	RCT Cluster	1	+	Adult primary care patients. New England, USA. *n* = 504 (of 1183 eligible) **Intervention:** Mean age = 49.9 ± 12.5 years 77.4% female 83% white 62% with at least a bachelor degree. **Control:** Mean age = 56.8 ± 12.9 years 63.1% female 97% white 56.9% with at least a bachelor degree.	**Aim:** To evaluate a multifaceted nutrition intervention to improve dietary habits among adult primary care patients. Intervention vs. control. Intervention comprised brief personalised recommendations at routine office visits and mailed personalised dietary recommendations, verbal endorsement and motivational phone calls to set targets. US$5 incentive offered for	Three-month follow-up survey (although intervention taking place during this time).	85% follow-up in intervention group. 92% follow-up in control group. Adjusting for age, sex, race and baseline intake, the change in self-reported fruit and vegetable intake in the intervention group was significantly higher than control (0.6 [95% CI 0.3, 0.8] servings/day. No intervention effect on dairy products. (no significance stated).	No allocation concealment. ITT analysis carried out. Some baseline differences. Mean age higher in control group. % of African Americans higher in intervention group. Self-reported outcomes – validated questionnaire. Meets criteria for a **social marketing** intervention (see methodology).

					completion of baseline survey and US$5 for final survey. **Delivered by:** Primary care physician or nurse practitioners and trained telephone counsellors. Nutritionist if necessary.			
Steptoe 2003 UK Study	RCT Individual	1	++	Patients from a primary care centre in a deprived, ethnically mixed, inner city area, UK, aged 18–70 years. *n* = 271 61% female 26% Black 3% Asian 70% White 68% in low-income category. 34% in receipt of benefits.	**Aim:** To measure the effect of brief behavioural counselling in general practice on consumption of fruit and vegetables in adults from a low income population. Two × 15 min counselling (2 weeks apart) on: 1) nutrition counselling (education and	12 months	At 12 months, 81% follow-up in behavioural counselling group, and 80% follow-up in nutrition counselling group. Consumption of fruit and vegetables increased from baseline to 12 months by 1.5 and 0.9 portions per day in behavioural and nutrition groups (mean between group difference 0.6 [95% CI 0.1, 1.1] portions, $p = 0.021$). The proportion of participants eating five or more portions a day increased by 42% with behavioural counselling and 27% with nutritional counselling in the two groups (mean between group difference 15 [95% CI 3, 28]%, $p = 0.019$). There were significant between-group differences suggesting that one	No allocation concealment. ITT analysis carried out. No true control group and low recruitment (12%).

					information); or 2) behavioural counselling (tailored advice). **Delivered by:** Research nurses.		counselling intervention was more effective than the other. Differences were maintained when analysis restricted to 177 participants with incomes ≤£400 per week.	
John 2002 UK Study	RCT Individual	1	++	See above.	See above.	See above.	95% follow-up in both groups. Self-reported daily fruit and vegetable intake increased by a mean 1.4 (SD 1.7) portions in the intervention group and by 0.1 (SD 1.3) portion in the control group (between group difference = 1.4 [95% CI 1.2, 1.6], $p < 0.0001$).* Mean difference of 1.3 (95% CI 0.9, 1.6) daily portions between intervention and control for 'pre-contemplators', 1.6 (95% CI 1.2, 1.9) daily portions for 'contemplators' and 1.3 (95% CI 0.9, 1.7) daily portions for those in 'action' (all p values < 0.001). *Adjusted for baseline value and sex.	Self-reported outcomes.
Beresford 1997	RCT Cluster	1	+	Adult patients from six primary care clinics in Puget Sound, Seattle, USA. n = 2111* (of 3490 eligible)	**Aim:** To evaluate the effectiveness of a low-intensity dietary intervention in primary care practice in	3 months and 12 months	86.1% follow-up at 12 months. Both groups reduced their self-reported fat intake (% energy from fat) from baseline but at both 3 and 12 months, changes from baseline were significantly larger in the intervention group compared with control.	* As reported in abstract (value of 2121 given in text). Allocation concealment used but no ITT analysis.

				51% ≥ 65 years 68% female 91% White 28% income <US$25,000.	lowering dietary fat intake and raising dietary fibre intake. Physicians gave intervention patients a self-help booklet and brief motivational message during routine appointment. Reminder letter 2 weeks later. Control was usual care. **Delivered by:** Physicians.		**At 3 months:** Mean intervention effect –1.04 (95% CI –1.67, –0.41), $p < 0.01$. At 12 months mean intervention effect –1.20 (95% CI –1.68, –1.73), $p < 0.01$. The corresponding differential change in fat score was –0.046 (95% CI –0.074, –0.018), $p < 0.01$ at 3 months and –0.044 (95% CI –0.073, –0.016), $p < 0.01$ at 12 months.	
Evidence of efficacy (internal validity) for physical activity outcomes								
Eden 2002	Systematic review	1	++	Literature search 1994 – March 2002. Seven RCTs and one CCT included rated as 'good' or 'fair' quality.	**Aim:** To determine whether counselling adults in primary care settings improves and maintains PA levels.		Evidence is inconclusive that counselling adults in the primary care setting to increase PA is effective. Among six controlled trials with a usual care control group, the effects of counselling on PA were mixed with three trials showing statistically significant increases in PA and the remaining three trials showing no effect. Because most studies had at least one methodological limitation, it was difficult to rigorously assess the efficacy of	Included trials: Physically Active for Life 1999 Norris 2000 Smith 2000 Kerse 1999 Change of Heart 1999 Burton 1995 Activity Counseling Trial 2001 Swinburn 1998

							interventions. More evidence is needed.	
Eakin 2000	Systematic review	1	++	Literature search 1980–98. Fifteen RCT or quasi-experimental controlled trials reviewed.	**Aim:** To summarise primary care based interventions for increasing PA and make recommendations for integrating successful strategies into practice.		Primary care-based PA counselling is moderately effective in the short term, although there is considerable variability across studies. Studies in which the interventions were tailored to participant characteristics and which offered written materials to patients produced stronger results. Of ten studies reporting 0- to 11-month post-intervention outcomes, seven reported statistically significant PA outcomes. Of the seven studies reporting post-intervention outcomes at 12 months or longer, three reported statistically significant outcomes.	Included studies: [studies not referenced by Eakin] Goldstein 1999 Bull 1998 *Stevens 1998 *Swinburn 1998 Marcus 1997 Calfas 1996 Dowell 1996 Burton 1995 Elder 1995 Graham Clarke 1994 OXCHECK 1994 Lewis 1993 Logsdon 1989 Kelly 1989 Reid 1979
Morgan 2005	Systematic review	1	+	Literature search to 2002. English language studies only. Nine RCTs included, four of which were from the UK – see comments.	**Aim:** To review current evidence of effectiveness for exercise referral schemes. Studies had to be based in primary care settings.	Limited information in review. Unpicking required (and done for UK studies only).	Exercise referral schemes appear to increase PA levels in certain populations, namely those who are not sedentary but already slightly active, older adults and those who are overweight (but not obese). However, increases in the level of PA may not be sustained over time.	Included since updates older reviews but of lesser quality. No unpublished studies sought and English language studies only included. Little detail of quality methods and appraisal probably undertaken by one reviewer only. UK studies all unpicked: Taylor 1998; Stevens 1998; Harland 1999;

								Lamb 2002
Elley 2005	RCT Cluster	1	++	See above.	See above.	See above.	85% follow-up of enrolled patients at 12 months. Mean total energy expenditure increased by 9.4 kcal (39 kJ)/kg per week (p = 0.001) and leisure exercise by 2.7 kcal (11 kJ)/kg per week (p = 0.02) or 34 min/week more in the intervention group than in the control (p = 0.04). The proportion of the intervention group undertaking 2.5 hours/week of leisure exercise increased by 9.72% (p = 0.003) more than in the control group (number needed to treat 10.3).	See above.
Lamb 2002 UK Study	RCT	1	+	See above.	See above.	See above.	Loss to follow-up at 12 months was approximately 27% in each group. No statistically significant differences between people lost to follow-up and those who remained in the trial. There were no significant between group differences (between intervention groups) in self-reported PA at 12-month follow-up by intention to treat analysis (between group difference = 6 [95% CI –5, 16.4])%. In people who completed the trial, health walks was more effective than giving advice only in increasing moderate intensity activity above 120 min/week (between group difference = 13 (95% CI 0.003, 25.9)%, p = 0.05).	
Stevens	RCT	1	+	714 people aged	**Aim:**	10-week	1288/2253 approached completed	Randomisation method

1998				45–74 years from two London general practices classed as not active (i.e. sedentary or low/high intermediate activity). Circa 42% men, 54% economically active, 85% white, 29% degree level, 34% no qualifications. All on the surgery lists in the targeted age group were sent a PA questionnaire.	To assess the (cost) effectiveness of a primary care based intervention aimed at increasing levels of PA in inactive people aged 45–74 years. **Intervention subjects:** Consultation with exercise development officer and personalised 10-week programme combining leisure centre and home-based activities. **Control subjects:** Information on local leisure centres. Higher	intervention. Assessment 8 months after randomisation.	questionnaires (57%). 714 were randomised. Of 363 randomised to intervention 35% (126) attended the first consultation and 25% (91) returned for the second consultation at the end of the 10-week programme. There was a net 10.6 (95% CI 4.5, 16.9)% reduction in the proportion of people classified as sedentary in the intervention group compared with the control group, 8 months after baseline. The intervention group also reported an increase in the mean number of episodes of PA per week compared with the control group (an additional 1.52 (95% CI 1.14, 1.95) episodes.	not described. No concealment allocation. Self-reported PA measures but using a validated tool (Blair's 7-day recall). ITT analysis used. Most PA was undertaken away from the leisure centre and the authors concluded that environmental efforts to encourage activities not requiring attendance at a leisure centre may have a greater impact.

					education/health promotion researchers. Intervention by one exercise development officer. No power calculation.			

Evidence of corroboration (external validity)								
Evidence of salience – Is it appropriate for the UK?								
First author	**Study design**	**Research type**	**Research quality**	**Study population**	**Research question**	**Length of follow-up**	**Main results**	**Confounders/comments**
Steptoe 2003 UK Study	RCT Individual	1	++	Patients from a primary care centre in a deprived, ethnically mixed, inner city area, UK.	See above.	See above.	See above.	See above.
John 2002 UK Study	RCT Individual	1	++	Healthy participants aged 25–64 years recruited from a primary care health centre, Thame, Oxfordshire, UK.	See above.	See above.	See above.	See above.
Lamb 2002 UK Study	RCT	1	+	Men and women taking less than 120 min of moderate intensity activity per week. Reading, UK.	See above.	See above.	See above.	See above.
Tully 2005	RCT	1	+	Thirty-one healthy, sedentary 50–65-	See above.	See above.	See above.	See above.

	Individual			year-olds identified by searching the medical registers of three urban general practices in Belfast, UK.				
Taylor 1998	RCT Individual	1	+	142 recruits from 345 men and women, aged 40–70 years and identified as smokers, hypertensive of overweight on medical records in East Sussex general practices.	See above.	See above.	See above.	See above.
Imperial Cancer Research Fund 1995 UK study	RCT	1	+	Patients aged 35–64 years in 1989 from five urban general practices. Bedfordshire, UK	See above.	See above.	See above.	See above.
Imperial Cancer Research Fund 1994 UK study	RCT	1	+	Patients aged 35–64 years in 1989 from five urban general practices. Bedfordshire, UK	See above.	See above.	See above.	See above.
Family Heart Study Group 1994	RCT	1	+	Male patients on GP lists in 26 practices in 13 towns, and their partners, UK.	See above.	See above.	See above.	See above.

Evidence for implementation – Will it work in the UK?								
First author	**Study design**	**Research type**	**Research quality**	**Study population**	**Research question**	**Length of follow-up**	**Main results**	**Confounders/comments**
Gidlow 2005	Systematic review	3	++	Literature search to October 2003 for UK exercise referral interventions. Nine studies met the inclusion criteria: four RCTs and five evaluations of existing schemes.	**Aim:** To explore the attendance of UK exercise referral schemes (ERS), who attends them, why participants drop out of schemes and to compare evaluations of existing ERS with RCTs. Method of participant recruitment was the only marked difference between the two types of study. In RCTs and evaluations, rates of referral uptake and	The durations of the interventions were 10 (*n* = 5), 12 (*n* = 2) or 14 weeks (*n* = 1), although one RCT lasted 2 years despite reporting 10-month outcomes.	Attendance was generally poor; approximately 80% of participants who took up referral dropped out before the end of programmes. More women than men took up referral (60 vs. 40%) but there was no evidence of higher attendance in women. None of the participant characteristics reported were consistently associated with attendance. Most of the reasons for attrition and negative comments from participants related to practical problems associated with attending leisure facilities.	

					attendance were varied but comparable. All interventions were facility-based.			
Keller 1999	Systematic review	3	++	Literature search 1990 – June 1998. Twenty-seven primary and secondary prevention studies included.	**Aim:** To provide a critical systematic review of research using social cognitive theory in exercise research.		Individual perceptions of self-efficacy ('I believe that I can exercise regularly') are important and strongly related to exercise behaviour. Intervention studies demonstrated that participation in an exercise programme promoted self-efficacy and that programmes designed to increase outcome expectations and self-efficacy significantly increased exercise behaviour. Clinicians can facilitate perceptions of self-efficacy by verbal persuasion, modelling exercise behaviour and discussing the positive physical effects of PA.	Worldwide review. Unknown if any of the studies were based in the UK.
John 2004	Qualitative study (from RCT)	3	++	Purposive sample* (of patients not selected as contemplating change) from participants in an RCT examining effectiveness of a nurse-led intervention to increase fruit and vegetables intake. Thame, Oxfordshire, UK.	**Aim:** To examine the barriers to fruit and vegetables consumption after a 6-month trial. Participants asked at initial intervention interview to anticipate barriers and	Interviews carried out 2 weeks after 6-month follow-up.	Barriers anticipated and experienced: • Women reported children and male partners as obstructive to attempts to increase fruit and vegetables consumption. Men reported that partners were supportive. • Additional time needed to prepare food. • Perceived expense of fruit and vegetables. Barriers discovered during intervention: • Problems of getting fruit and vegetables while travelling.	*Sample selected to include those likely to have experienced different barriers. Same study as John 2002.

				n = 40 Mean age 45.9 years 47.5% female Social class I and II = 47.5% Social class III M, III NM, IV and V = 52.5% 72.5% had reported an increase in fruit and vegetables consumption.	discussed barriers at 6-month follow-up. Semi structured interviews carried out at respondents' homes by independent researcher to explore barrier issues in greater depth. **Delivered by:** Intervention by nurses.		• Problems when routine is disrupted at weekends. • 37 of 40 people reported at least one barrier, but 29 of 40 still reported increasing their fruit and vegetable consumption.	
Taylor 2005	Qualitative study (from RCT)	3	+	142 recruits from 345 men and women, aged 40–70 years and identified as smokers, hypertensive of overweight on medical records in East Sussex general practices. Circa 37% men. No socio-economic details provided.	**Aim:** To examine the effects of a GP exercise referral programme on modifiable coronary heart disease risk factors. See Taylor 1998 for details.	Ten-week intervention. Outcomes measured at 0, 8, 16, 26 and 37 weeks.	The exercise group became significantly ($p < 0.05$) more positive about their physical self-worth, physical condition and physical health (but not their physical appearance) than did the control group between baseline and subsequent assessments.	Interviews at eight weeks identified that 50% were positive, 35% had mixed feelings and 15% had only negative comments about the concept of GP referral to a leisure centre-based exercise programme. Concerns included the long waiting time before the introductory session, lack of staff support in a sometimes crowded and noisy exercise room and inconvenient times (off peak hours 09.00–17.00 hours only).

								See Taylor 1998 for quantitative results.
Fuller 2003	Qualitative Study	3	+	GPs *n* = 15 (eight female, seven male) and 30 patients (15 married couples in social class 3, 4 or 5 with young children) from general practices in the Lothian area of Scotland, UK.	**Aim:** To investigate the view of GPs and their patients about healthy eating and the provision of healthy eating advice in general practice. **Delivered by:** N/a.	N/a	GPs and couples saw the general practice setting as a place for treatment of illness and disease. Interviews with couples revealed that health was only one factor that appeared to influence day-to-day decisions about food choice, and that they felt expert messages were contradictory. They felt 'bombarded' by healthy eating information, particularly from the media. GP advice affected by personal preferences and greater enthusiasm was displayed by younger and female doctors. GPs felt that dietary advice may damage their relationship with patients.	Very small sample size, is likely to be underpowered to detect an effect if one exists.
Duaso 2002	Cross-sectional survey	3	+	Patients from a general practice in north-east of England. *n* = 516 (from 3612 eligible) Age range = 17–45 years Characteristics below for responders only (*n* = 316) 59.2% female	**Aim:** To examine patients' recall and perceptions of lifestyle counselling received from practice nurses, and whether patient needs were met. Structured postal	N/A	63% response rate (316 of 516). Those with unhealthy behaviour profiles seem to have received more advice. There appears to be a discrepancy between patients' expectations of lifestyle advice from the practice nurses and the receipt of such advice. Significantly more respondents would have liked to have received advice on diet, weight reduction and exercise than actually received it ($p < 0.001$).	Low response rate. Under-reporting by patients may have occurred due to memory or not recognising advice for what it was.

				Mean age male = 34.1 years and female 33.6 years White, male = 92% Female = 97% In full time employment, male = 98%, female = 72%	questionnaire with letter from GP and stamped self-addressed envelope included. **Delivered by:** Lifestyle counselling by nurses.		On average, patients found the advice received from the practice nurses very/fairly helpful, but significant difference between male and female perceptions: most women found the advice very/fairly helpful while male patients more dubious ($p < 0.05$).	
Hardcastle 2001	Qualitative study	3	++	Older women newly referred by their GP to an exercise programme at a local leisure centre. *n* = 15 Age range = 50–80 years	**Aim:** To explore past and current experiences of PA and perceptions of what blocks/motivates older women to be active. One 20–40 min semi-structured interview in leisure centre cafeteria (based on 'life story' technique), and two follow-up interviews at 5 and 10 weeks. **Delivered by:** Unclear,	10 weeks	80% of the women appeared to have initiated the idea for referral with their GP and the data show an informal network whereby referred women advocate exercise in the community. The data show a lack of commitment, confidence and encouragement from the GPs in promoting PA and referring to exercise programmes. The data show that social support appears to be crucial for some older people, especially regarding instruction and the interpersonal skills of the exercise instructor.	Questions posed during interviews unknown. Very small sample size, is likely to be underpowered to detect an effect if one exists.

					possibly exercise practitioner/instructor.			
Martin 1999	Qualitative data from retrospective analysis	3	+	Finishers (16 male and 26 female) and non-finishers (12 males and 23 females) of a 10-week GP referral exercise prescription programme, Margate, Kent, UK. Mean age = 52.9 years 51% had BMI >25 kg/m^2.	**Aim:** To examine characteristics of finishers and non-finishers of a GP exercise referral scheme. Semi-structured telephone interviews conducted by an independent interviewer **Delivered by:** Unclear.	N/A	Finishers were less reliant on social support and more likely to report tangible health benefits. Non-finishers relied on support from others when attending the gym. Both finishers and non-finishers felt intimidated by others at the gym and felt it was not a comfortable environment for older people. Also, there was feeling in both groups that initial exercise programmes not appropriately tailored. Reasons for non-finishing were mainly illness and injury, but work pressures, time and transport problems were also cited.	Programme had been running for 3 years – responses may be susceptible to recall bias so reliability of results is limited. Content of semi-structured interviews not reported. Results suggest that methodology used was too crude to accurately measure complex characteristics that determine differences between finishers and non-finishers.
See Tai 1999	Cross-sectional survey	3	+	Inner-city general practice patients referred to an exercise prescription at a local leisure centre. *n* = 152 71% female Age range 16–75 years	**Aim:** To examine factors that affect adherence to a GP referral to exercise prescription scheme at a local leisure centre.	N/A	Adherers to exercise programme were significantly older than non-adherers ($p = 0.026$). Previous barriers to exercise included lack of money, having no energy, not knowing about local exercise facilities, having no partner to exercise with, not being fit enough and having no time. A significantly higher proportion of those who cited 'lack of money' as a barrier	May be of particular relevance to GPs in deprived urban area where high morbidity co-exists with low incomes. Same programme as Smith 1996

					Demographic and barriers data collected at baseline and analysed for adherers and non-adherers. **Delivered by:** Referral by GPs and associated staff. Delivered by trained fitness consultant and referred back to GP.		dropped out of the programme than those who did not cite it as a barrier (55.3 vs. 44.7%, *p* = 0.024). Those who cited 'not knowing about local exercise facilities' as a barrier were 3.5 times more likely to complete the programme (*p* = 0.043).	
Ashley 1999	Qualitative questionnaire study	3	++	336 participants of a Health Walks scheme in Woodley in the Thames Valley and 22 walk leaders. **Walkers:** 78% female. Mean age 58 (SD 10.2), range 27–83 years. 2% unemployed, 47% retired, 11% home-makers. Primarily white (Woodley is 96% White).	**Aim:** To determine the effectiveness of Health Walks in an urban area, specifically looking at how the local development of schemes can be coordinated. Questionnaire study of walkers and walk leaders.	N/A	47% response (*n* = 476) to 768 surveys but only 366 had attended at least one walk and, thus, completed the questionnaire. 22/29 walk leaders (76%) completed questionnaires. The Health Walks programme was a sustainable form of exercise for the majority of participants; 90% said they would continue with the programme. The three main motivators for walk leaders were companionship, ownership of the scheme and appreciation of their commitment to the organisation. Recommendations from the research included:	Study funded by the Countryside Agency and British Heart Foundation. There were a higher proportion of respondents who had completed more than two Health Walks and women than found in Health Walks participants generally. Given the higher proportion of regular attenders, the high percentage saying they would continue walking should be treated with caution.

				Researchers probably from Oxford Brookes University.	**Delivered by:** Volunteer walk leaders.		• take into account the seasons, and varying needs (levels of difficulty, evening walks for workers etc.) in promotion and planning; • emphasise the social aspects; • target participants via general practice, including close links with local health centres; • emphasise the importance of moderate daily activity (e.g. errands by foot rather than by car).	Qualitative study linked to RCT in Lamb
Vernon 1998	Cross-sectional survey	3	+	Members of the general public living in Salisbury, UK, who had requested a walking pack. *n* = 322 71% female	**Aim:** To evaluate the 'Doorstep Walks' scheme, a pack detailing ten local walks and benefits of PA, devised by 'Salisbury Walking Forum', an alliance of local groups. Questionnaires issued to collect demographic information and identify motivations and barriers to walking. **Delivered by:**	N/A	229 questionnaires returned (71% follow-up) and 61% uptake. Few respondents (14%) thought that 'having the walks recommended by a GP or health professional' was an important motivating factor. By far the most frequently given reason for non-participation (60%) was the shortage of free time, although other barriers were having no one to walk with (15.6%), having no walks near their home (14.4%), being fearful of walking the routes unaccompanied (12.2%), physically unable (11.1%), needed more encouragement (8.9%) and cost restriction (11.1%). GP surgeries cited as the single most common place to find out about the initiative.	Study design did not allow for an analysis by activity level, which limits application of the findings.

					Salisbury walking forum, an alliance of local groups.			
Smith 1996	Qualitative study	3	++	Clinical and support staff (23 of 40) in 10 (of 14) general practices involved in referring patients to exercise prescription programme in Inner-London leisure centre. GPs *n* = 16 Practice Nurses *n* = 4 Practice Managers *n* = 4 Receptionist *n* = 1 34.8% male (all GPs)	**Aim:** To identify practices' reasons for joining exercise referral scheme, perceptions of benefit of scheme, selection criteria for referral and reported personal behaviour. Semi-structured interviews carried out at practices. **Delivered by:** N/A	N/A	Referring practice members saw exercise promotion as a therapeutic option, rather than an instrument for primary prevention. Legal implications of referring patients led to over-caution and frustration among referring practice members at not being able to refer the people they considered most in need of the scheme. (Family Health Services Association [FHSA] criteria allowed only 'low risk' patients to be referred). Majority of participants said they participated in some form of sport or leisure activity. The main reason for not doing so was lack of time due to work or social commitments.	May be of particular relevance to GPs in deprived urban area where high morbidity co-exists with low incomes. Same programme as See Tai 1999
Horsefall Turner/Wealden District Council 1997	Evaluation and survey	3	+	Patients referred by GPs to exercise prescription who presented themselves at leisure centre. East Sussex, UK.	**Aim:** To evaluate Wealden District council's Oasis programme of exercise	N/A	1994 (January–July), 21.9% completers. Males more likely to complete than females (27.4 vs. 19.1%). Older patients more likely to complete. Patients referred by GPs who referred the most patients were more likely to complete. Risk category did not affect adherence.	1994. Follow-up of non-adherers stopped when time ran out. 1997 (and 1994?). Data presented on those who were referred and

				1994: *n* = 729 65.4% female >75% aged ≥41 years **1994–1997:** *n* = 627, 66% female Mean age 52 years, range 16–87	referral from GPs to a leisure centre in terms of factors affecting adherence, client views and physiological data. **Two evaluations:** 1994 – Adherence characteristics examined through initial consultation data – non-adherers telephoned. 1997 – questionnaire survey of sample of 192 participants. **Delivered by:** Referred by GP, delivered by programme staff (including fitness instructors and		Principle reasons for non-completion were patient too busy (32.5%) or had become ill or injured (28%). Significant number dropped out due to insufficient supervision or that programme too boring. Other factors were expense and transport. December 1994 – May 1997: 43% completed (47% of males who started and 41% of females). No major differences in completion rates found according to initial fitness or location. Clients referred for medical complaints such as hypertension or arthritis appear to demonstrate better adherence than those referred for stress or weight loss. Adherence significantly better for medium-risk groups compared with high- and low-risk groups. Questionnaire sample biased towards adherers, but general satisfaction with programme. Area identified for improvement was amount of time staff have to spend with clients.	presented themselves at the leisure centre. 1994–1997. Sample selection criteria not given.

					liaison nurse) and referred back to GP.			
Fielder 1995	RCT (suspended)	1	N/A (as trial suspended)	Sedentary patients aged 18–64 years from seven general practices within a 4-mile radius of the local leisure centre. *n* = 38 (out of 900 patients needed to show an effect). RCT suspended.	**Aim:** To assess whether referral to a leisure centre programme was a major factor leading to increased PA. This paper aims to examine data from the RCT to understand failure of trial. **Delivered by:** Referral by GP and fitness assessment presumably from leisure centre staff.	N/A	Slow rate of recruitment into trial. GPs cited the increase in time spent with patients, complicated nature of questionnaire, lack of space for patient to fill in questionnaire and lack of financial incentive for GP as reasons for this.	Suspended RCT as trial did not achieve required sample size.
Hopper 1995	Cross-sectional survey/case study	3	+	Active GP practices in on Sheffield Health Authority's GP practice list. *n* = 100 Primary health care workers	**Aim:** To investigate level of advice given on dietary matters, methods used to give this advice and nutritional		Interviews conducted in 46 of 100 active practices (46% response rate). Practice nurses gave dietary advice more frequently than GPs ($p < 0.05$) and GPs were more likely ($p < 0.05$) to give verbal advice only, whereas practice nurses tended to take a dietary history and give both written and verbal advice. Most GPs	Unknown if questionnaire was validated. Low response rate.

				interviewed *n* = 58. GP *n* = 36 (83% male, mean age 56 years). Practice nurse *n* = 22 (100% female, mean age 35 years).	knowledge and attitudes towards nutrition by Sheffield Primary Health Care Trusts (PHCT), GPs and practice nurses. Structured questionnaire administered by interviewer. **Delivered by:** N/a.		surveyed mentioned the major constraint to offering dietary advice was time. All practice nurses and half of GPs surveyed were interested in attending a nutrition course, but the majority of GPs cited time as a barrier to this. A large proportion of primary health care workers felt that their practice population was not sufficiently motivated to follow dietary advice.	
Ursell 1999	Qualitative study	3	+	Community pharmacists (CPs) (*n* = 96, random sample), lead health authority pharmaceutical advisors and medical directors of public health (*n* = 26) in the West Midlands. No socio-economic information provided. Researchers from the School of Pharmacy, Aston	**Aim:** To examine the attitudes of CPs and those responsible for pharmaceutical policy at health authority level towards a role for community pharmacy in public health provision. Postal questionnaire. **Delivered by:** N/A	N/A.	Overall response rate = 48%. CPs 44%, public health directors 62% and lead pharmaceutical advisors 69%. The proportion of CPs (50%) who perceived the current role of the pharmacist in public health provision to be 'very important' was significantly greater than the corresponding group of policy makers (11%, $p < 0.01$). Lack of time was cited by 62% of CPs as the most important constraint preventing pharmacist involvement in public health promotion while financial issues were considered the most important constraint by 40% of policy-makers. When asked about possible solutions to aid pharmacy involvement, pharmacist	Brief report and very little methodological detail provided. The questionnaire does not appear to have been validated.

				University.			inclusion in primary care group function was considered essential by 27% and 79% of policy-makers and CPs respectively. The need for increased funding (73%, 96% respectively) and appropriate training (67%, 70%) were both highly regarded. The authors tentatively proposed that, given the disparity of views, a clear dialogue on the issue should be established between CPs and policy-makers.	
Anderson 1998b	Qualitative study	N/a	++	Consumers (*n* = 592) interviewed in six pharmacies in Barnet. 74% female. 40% ≥60 years old. 85% white European, 15% unemployed, 35% retired. 90% regular pharmacy users. Researchers probably from Kings College London.	**Aim:** To investigate whether consumers came to the pharmacies for advice on general health matters, read health promotion leaflets and had heard of the Barnet Health Authority High Street Health Scheme (HSHS). **Delivered by:** N/A	N/A.	Many consumers do not currently perceive that there is a role for community pharmacists in health promotion. The GP's surgery was felt to be the most convenient place to get advice about staying healthy, and the GP the best person from whom to get it. The pharmacist was rated second, above the media, although only 15% of respondents had ever asked the pharmacist for general health advice. Only 40% thought that it was the usual job of the pharmacist to give advice about staying healthy although 92% said that they could pick up health information leaflets at the pharmacy. The authors concluded that pharmacist training alone would not change the public's perception of pharmacists. There was no significant variation in responses according to age, race or	Health authority-funded project.

							employment status although women were more likely to get advice from the media.	
Keene 1995	Qualitative study	3	+	Pharmacy contractors based in West Glamorgan. *n* = 48 (of 50)	**Aim:** To examine present state of health education among pharmacists, perceived costs and benefits, and factors to increasing health education activity. Questionnaires with open and closed questions, interviews of up to 1 hour and ethnographic notes. **Delivered by:** Academic and Health Authority researchers.	N/A	Great majority of contractors expressed support for engaging in health promotion but some qualified it with arguments of it being a significant waste of resources and a diversion from core activity of dispensing. Two-fifths of respondents saw time as the strongest constraint against health promotion, one-fifth mentioned space and just under one-third referred to cost. Majority saw training as an essential part of developing pharmacy services, but concerns about co-ordination of training and lack of time for training featured prominently in the comments.	Survey small in scale and range.
Moore 1995	Qualitative study	3	++	Community pharmacists in Kingston and Richmond FHSA, UK.	**Aim:** To identify health promotion activities, and	N/A.	Pharmacists' activities in health promotion were 2.5 times more likely to be reactive rather than proactive. Barriers to health promotion experienced	

				n = 30 (of 34 approached)* *Reasons for refusal include lack of time, illness of pharmacists or unwillingness to participate.	barriers to improving and increasing health promotion activity in community pharmacies. Structured interviews by a research pharmacist. **Delivered by:** N/A		by community pharmacists were lack of time and space, need for a consulting area, desire for payment by the FHSA, need for training, insufficient support from their local health promotion unit, lack of regular contact with health promotion facilitator and the need for more staff.	
Coggans 2000	Qualitative survey, Delphi analysis and literature review	3	++	1) Semi-structured interviews with 60, 30 pharmacists and 30 pharmacy assistants, in community pharmacies in Scotland. 2) Dephi exercise with 25 health professionals. 3) Literature review. Pharmacy customers: 68% female, 7% <20 years, 22% ≥60 years. 19% higher managerial and 7% long-term	**Aim:** To find out what aspects of health promotion are pharmacy customers most receptive to and what methods are appropriate for the delivery of pharmacy health promotion. Research carried out by the Pharmaceutical Services	N/A	Although virtually every customer reported that they were happy to discuss health information with the pharmacist or assistant, <32% reported that they would seek information or help in the community pharmacy on healthy eating and only 23% would seek information or help on taking exercise. Pharmacists were willing and eager to discuss a range of health issues with customers, although there was some reluctance in relation to lifestyle issues, as well as awareness of the limitations arising from lack of privacy. Conclusions from the survey and Delphi study were that factors that facilitate pharmacy staff/customer interaction should be addressed as well as enhancing perceptions of pharmacists as key players in the health care team who provide a confidential service.	

				unemployed.	Division of the Scottish Executive Health Department. **Delivered by:** N/A			
Benson 1995	Qualitative study	3	+	Purposive sample of ten practicing community pharmacists in the UK to obtain geographic and socio-economic range. All white, Anglo-Saxon. Six women, four men. Researcher background unknown (National Pharmaceutical Association/King's College).	**Aim:** To explore pharmacists' perceptions of the nature of their health education role, the practicalities of implementing this role and the obstacles to be overcome. **Delivered by:** N/A	N/A	There was considerable uncertainty about the health education role of pharmacists. There were profound concerns among the respondents that a health education role required 'interference' in patients lives and that health education was often not income generating, a barrier for pharmacies since they run as commercial enterprises. The authors concluded that a paradigm shift would be needed to overcome the barriers of the pharmacist's traditional inclination to a product orientated approach and ethical concerns about interference.	Small sample and all White. Paper lacked methodological detail – example quotes rather than detailed summary provided.
Biddle 1994	Evaluation of case studies	3	+	Structured sample of 50 (of 173) PA promotion schemes in primary health care (20 practice managed and 30 leisure centre managed).	**Aim:** To identify existing PA interventions and any evaluations of them and identify criteria	N/A	Success of PA promotion depends on qualities of key personnel in contact with participants, in particular appropriate training in health promotion techniques and counselling for exercise. Establishing a scheme depends on the enterprise of an energetic innovator.	

				Sample structured in order to get examples from a range of environments and participant profiles. Primary health care facilitators interviewed *n* = 50.	for and barriers to success. Structured questionnaire checklists delivered over the phone (or mailed if lack of time). **Delivered by:** N/A		In most schemes participants are predominantly middle-aged women, often overweight.	
Baron 1990	Survey within RCT	3	+	Patients on the lists of a group general practice in Abingdon, Oxford, UK. Intervention subjects from an RCT investigating the effect of nutrition advice by a nurse in general practice. *n* = 187 52% male Mean age = 41.6 years	**Aim:** To examine difficulties encountered by intervention subjects (queried at 1, 3 and 12 months) with the dietary recommendations. Intervention received 30 min session with nurse aimed at lowering fat and increasing fibre intake. Booklet and two follow-up sessions at 1 and 3 months	3 months and 12 months	89.3% follow-up in intervention group at 12 months. Dietary intervention appeared to be well accepted by the intervention group. 8% thought the recommended regimen was hard to prepare or difficult to find in restaurants. 10% of the intervention group noted that they or their families disliked the recommendations and subjects with this complaint were more likely to drop out of the study.	No allocation concealment. No ITT analysis. Number of subjects evaluated for difficulties encountered with the dietary advice vary because of losses to follow-up and missing data.

					Delivered by: Intervention by nurse.			