

# A systematic review of the effectiveness of the provision of brief lifestyle advice in primary care

Jennifer Barker, Hermione Price

**Healthcare professionals are being asked to provide brief lifestyle advice at every available opportunity. This review assesses the evidence for brief lifestyle advice in primary care and further implications for management. Method: A MEDLINE library search for randomised controlled trials of brief lifestyle advice on smoking, exercise, diet and alcohol consumption that were published between January 1996 and January 2012 was carried out. Results: Nineteen randomised controlled trials were identified assessing brief intervention compared with either usual care or a more intensive intervention. The length of follow-up was a maximum of 2 years. Brief lifestyle advice was less effective than intensive intervention in six out of 10 studies. There were also six out of 10 studies showing that brief lifestyle advice was better than no intervention or usual care. Many people were lost to follow-up and outcomes were often self-reported. Conclusion: The evidence base for brief lifestyle advice remains unclear but it is seen that adverse outcomes are rare.**

**B**rief lifestyle advice has been defined as advice delivered in a single consultation (Bull and Jamrozik, 1998), often opportunistically, that is usually of only 2–3 minutes' duration (Lewis and Lynch, 1993). It is commonly delivered in primary care and supported by written information (Calfas et al, 1996; Ashenden et al, 1997; Kreuter et al, 2000). Brief lifestyle advice often addresses a variety of modifiable behaviours including diet, physical activity, alcohol consumption and smoking (Ashenden et al, 1997). Interest in brief lifestyle advice has been increasing since it was identified that modifiable lifestyle factors including diet (Liu et al, 2000; Boekholdt et al, 2006; Myint et al, 2008), smoking (Gordon et al, 1974), alcohol consumption (Foerster et al, 2009) and physical activity (Hakim et al, 1998; Manson et al, 2002; Barengo et al, 2004; Hu et al, 2004) are associated with risk of future disease. Type 2 diabetes and obesity, both of which have been described as “epidemics”, provide excellent examples of diseases in which early, effective lifestyle interventions could prove lifesaving. The NHS Future Forum has recently recommended that all NHS healthcare professionals make “every contact count”,

a proposal that encourages lifestyle advice delivered at every contact with an NHS professional (Bailey et al, 2011). This is to be supported by the UK government (Lansley, 2012). In addition, there are already financial incentives in place to provide lifestyle advice in primary care with the aim of reducing overall risk in the population (British Medical Association and NHS Employers, 2009). However, concerns have been raised that public funds may be directed towards interventions for which there is little robust evidence of success (Ashenden et al, 1997).

A systematic review published in 1997 of 37 trials investigating the impact of brief and more intensive lifestyle advice versus no advice on physical activity, diet, smoking and alcohol consumption found that while the results were in general, promising, there was insufficient evidence to conclude that lifestyle interventions could produce substantial behaviour change (Ashenden et al, 1997). Most of the trials that were included followed participants for at least 1 year. This systematic review found that the odds ratio for smoking cessation following smoking cessation advice versus no advice was 1.32 (95% confidence interval [CI] 1.18–1.48) and that more intensive versus

**Citation:** Barker J, Price H (2012) A systematic review of the effectiveness of the provision of brief lifestyle advice in primary care. *Diabetes in Practice* 1: 69–77

## Article points

1. The purpose of this review was to examine the more recent evidence to determine the effectiveness of the provision of brief lifestyle advice in primary care.
2. Brief advice was defined as being of less than 30 minutes' duration, delivered face-to-face in a single consultation with no further follow-up or reinforcement by a person routinely employed in primary care (GP or practice nurse).
3. Brief lifestyle advice may result in some benefits in particular groups of people and rarely results in adverse outcomes. It can be used as a useful adjunct in clinical care.

## Key words

- Diet
- Lifestyle advice
- Physical activity

## Authors

Jennifer Barker is Core Medical Trainee and Hermione Price is Consultant in Diabetes & Endocrinology at Oxford Centre for Diabetes, Endocrinology & Metabolism, Churchill Hospital, Oxford.

### Page points

1. A search of the MEDLINE database was conducted including articles published between 1996 and January 2012. Studies from this period were included to update the findings of the 1997 systematic review. A specific list of search terms were used to identify relevant studies.
2. The review was restricted to studies published in the English language that investigated the provision of brief lifestyle advice to adults in primary care. Only studies with a randomised design were included. The authors examined studies that provided advice concerning physical activity, diet, alcohol consumption or tobacco smoking.
3. Trials were included irrespective of the duration of follow-up but needed to include a measure of behaviour change (for example, change in body weight, blood pressure or physical activity questionnaire score).

brief advice had no impact on the success of the intervention (odds ratio 1.07 [95% CI 0.88–1.29]). For diet, alcohol consumption and physical activity, the trials were too heterogeneous to be combined in this way.

The purpose of this review was to examine the more recent evidence to determine the effectiveness of the provision of brief lifestyle advice in primary care.

## Method

### Search strategy

A search of the MEDLINE database was conducted including articles published between 1996 and January 2012. Studies from this period were included to update the findings of the 1997 systematic review. A specific list of search terms were used to identify relevant studies (*Box 1*).

In total, 469 potentially relevant articles (including reviews of the literature) were identified through this search strategy. The abstracts for studies were retrieved and the reference lists from review articles were searched. From this initial survey a set of inclusion criteria was developed and the final selection of trials to be included was made. A total of 19 trials were selected.

### Inclusion criteria

The review was restricted to studies published in the English language that investigated the provision of brief lifestyle advice to adults in primary care. Only studies with a randomised design were included. The authors examined studies that provided advice concerning physical activity, diet, alcohol consumption or tobacco smoking. Studies that included advice on more than one of these behaviours were included. Studies were included if brief advice was compared with either no advice or usual care or with a more intensive intervention.

Brief advice was defined as being of less than 30 minutes' duration, delivered face-to-face in a single consultation with no further follow-up or reinforcement by a person routinely employed in primary care (GP or practice nurse). In general, advice was provided verbally and supported by written materials. Trials were included irrespective of the duration of follow-up but needed to include a measure of behaviour change (for example, change in body weight, blood pressure or physical activity questionnaire score). Studies were excluded if the

### Box 1. Search terms used to retrieve studies for this systematic review.

To retrieve studies conducted in primary care the following search terms were used:

- Primary care
- Family practice
- General practice

To retrieve studies concerning the provision of brief lifestyle advice, the following search terms were used:

- Health promotion
- Lifestyle advice
- Risk factors
- Health behaviour
- Patient education
- Brief lifestyle advice
- Counselling

To retrieve studies concerning the provision of physical activity advice the following search terms were used:

- Exercise
- Motor activity
- Physical activity

To retrieve studies concerning the provision of dietary advice the following search terms were used:

- Diet
- Diet therapy
- Diet sodium restricted
- Diet protein restricted
- Diet Mediterranean
- Diet carbohydrate restricted
- Diabetic diet
- Diet reducing
- Nutrition therapy

To retrieve studies concerning the provision of smoking cessation advice the following search terms were used:

- Smoking
- Smoking cessation
- Tobacco
- Tobacco use cessation

To retrieve studies concerning the provision of alcohol consumption advice the following search term was used:

- Alcohol

only outcome measure was thoughts about behaviour change or change in stage of change. Trials were also excluded if the advice was accompanied by a pharmacological agent (for example, nicotine gum or patches). The major reasons for excluding trials were:

- Not relevant to review (trial protocols, cost-effectiveness analyses, duplicate studies, cross-sectional studies of advice given in general practice).
- Non-randomised study design used.

**Table 1. Characteristics of brief lifestyle advice intervention trials.**

Trial	Country	N	Inclusion criteria	Study groups	Intervener	Mode	Duration	Quality
Armit et al (2009)	Australia	136	Sedentary adults aged 50–70 years	1. Brief GP advice 2. GP and exercise specialist 3. GP and exercise specialist plus pedometer	GP	S (PA) W	6 months	A3, B1, C3
Aveyard et al (2003)	UK	2471	Adult smokers	1. Leaflet 2. Self-help manual 3. Phone intervention 4. Manual plus nurse visits	Nurse	S (smoking) W	6 months	A2, B1, C3
Bull and Jamrozik (1998)	Australia	763	Sedentary adults	1. Brief advice 2. No advice	GP	S (PA) W	12 months	A2, B2, C3
García-Ortiz et al (2010)	Spain	3698	Sedentary adults aged 30–74 years	1. Usual care 2. Brief advice with option of further session where exercise programme was prescribed	GP	M	12 months	A3, B2, C3
Goldstein et al (1999)	USA	355	Sedentary adults	1. Brief activity counselling 2. Standard care	GP	S (PA) W	6 weeks	A3, B3, C3
Grandes et al (2009)	Spain	4317	Sedentary adults aged 20–80 years	1. Advice 2. Advice and activity prescription 3. Usual care	GP	S (PA) W	6 months	A3, B2, C3
Grandes et al (2011)	Spain	4317	Sedentary adults aged 20–80 years	1. Advice 2. Advice with exercise prescription 3. Usual care	GP	S (PA) W	2 years	A3, B2, C3
Harland et al (1999)	UK	523	Adults aged 40–64 years	1. One interview 2. Six interviews 3. Exercise vouchers 4. Control group	?GP	M (PA, smoking, diet, alcohol, weight) W	12 months	A3, B2, C3
Jimmy and Martin (2005)	Switzerland	161	Individuals aged >15 years	1. Brief GP advice feeding back a PA questionnaire 2. 45-minute counselling	GP	S (PA)	14 months	A1, B3, C1
Koelewijn-van Loon (2010)	The Netherlands	615	Adults meeting national guideline for CV risk management	1. Usual care 2. Two 20-minute consultations plus telephone conversation	Practice nurse	M (diet, exercise, smoking, alcohol, 10-year CV risk assessment, patient self-reported risk perception)	12 weeks	A2, B3, C1
Lancaster et al (1999)	UK	497	Smokers >18 years old	1. Brief advice 2. Advice plus follow-up counselling from a nurse	GP	S (smoking) W	12 months	A3, B2, C3
Little et al (2004)	UK	151	Sedentary adults	1. GP advice 2. Nurse counselling 3. Leaflet	GP	S (PA)	1 month	A2, B2, C1
Marshall et al (2005)	Australia	767	Inactive 40–70 year olds	1. Brief general PA advice 2. No advice	GP	S (PA) W	6 months	A3, B2, C3

Mode of intervention is classified as an intervention addressing a single behaviour (S) or multiple behaviours (M). PA=study addressed physical activity. W=intervention was supported by written materials. Quality score: low to high score 1–3; A=selection bias at entry; B=selection bias after entry; C=bias assessing outcomes. CV=cardiovascular disease.

**Table 1 (continued). Characteristics of brief lifestyle advice intervention trials.**

Trial	Country	N	Inclusion criteria	Study groups	Intervener	Mode	Duration	Quality
Petrella et al (2003)	Canada	284	Adults over 65 years old	1. Brief advice 2. Exercise advice and assessment	GP	S (PA)	12 months	A2, B2, C3
Pieterse et al (2001)	The Netherlands	530	Adult smokers aged 18–70 years	1. Brief advice 2. Usual care	GP	S (smoking) W	12 months	A1, B2, C3
Sacerdote et al (2006)	Italy	3186	Healthy adults aged 18–65 years	1. 15-minute intervention 2. Sham intervention	GP	S (diet) W	12 months	A2, B2, C2
Steptoe et al (1999)	UK	883	Adults with one or more modifiable CVD risk factor	1. Behavioural counselling 2. Standard advice	Nurse	M (diet, smoking, PA)	12 months	A2, B2, C3
Swinburn et al (1998)	New Zealand	491	Sedentary adults	1. Brief advice plus written materials 2. Brief advice alone	GP	S (PA)	6 weeks	A1, B2, C3
van Sluijs et al (2005)	The Netherlands	358	Adults aged 18–70 years with hypertension, hypercholesterolaemia, type 2 diabetes, not physically active in last 6 months	1. Brief advice 2. Physician-based assessment and counselling for exercise	GP or nurse	S (PA)	12 months	A3, B3, C3

Mode of intervention is classified as an intervention addressing a single behaviour (S) or multiple behaviours (M). PA=study addressed physical activity. W=intervention was supported by written materials. Quality score: low to high score 1–3; A=selection bias at entry; B=selection bias after entry; C=bias assessing outcomes. CV=cardiovascular disease.

- No brief advice intervention arm.
- Review articles.

### Data extraction

The authors extracted data from the published studies.

### Quality assessment

Studies were assessed using the simplified scheme described in the 1997 systematic review described earlier (Ashenden et al, 1997; Enkin et al, 2000). Three dimensions of trial methods were assessed: selection bias at entry to the study (for example, was a robust method of randomisation used?), selection bias after trial entry (for example, were analyses by intention to treat and were rates of follow-up high and similar in all groups?) and selection bias in assessing outcomes (for example, were individuals collecting and inputting data blinded to an individual's intervention allocation?). A score of 3 was awarded if maximal attempts had been made to control bias and 1 if little or no attempt had been made. In some instances the reporting of the study was such that a low score had to be awarded if no information was provided to the contrary.

### Data analysis

The trials included reported many different outcomes in a variety of ways. In view of this, data were extracted, summarised and tabulated. Outcome measures included self-reported changes in smoking behaviour, physical activity and diet, biochemical measures of smoking cessation including salivary cotinine and objective measures of fitness including a 6-minute walk test.

## Results

### Characteristics of trials

A total of 19 trials were included in the review (Table 1). Most physical activity trials recruited sedentary adults and most smoking cessation trials recruited adult smokers irrespective of other health conditions or comorbidities. A minority of studies recruited healthy adults. The studies included a broad range of ages from 15 to 80 years old. All studies included both male and female participants. The studies included a mixture of those that compared brief lifestyle advice with no advice or usual care and those that compared brief lifestyle advice with more intensive interventions.

**Table 2. Results of brief lifestyle advice intervention trials.**

<b>Trial</b>	<b>Study groups</b>	<b>Outcome</b>	<b>Problems</b>	<b>Overall effect of brief lifestyle advice</b>
Armit et al (2009)	1. Brief GP advice 2. GP and ES 3. GP and ESP	Increase in self-reported activity in all groups with an average increase of 128 minutes per week (95% CI 79–177) at 24 weeks. No between-group differences in increase in activity but greater proportion in ES and ESP groups meeting activity target (150 minutes per week) at 24 weeks. OR 1.14 (95% CI 0.47–2.76) and 2.39 (95% CI 1.01–5.64); $P < 0.01$ in both groups.	Sample size was not big enough to detect a difference as the variance was larger than expected. Self-reported PA, inconsistent delivery, exercise specialist not blinded.	Positive
Aveyard et al (2003)	1. Leaflet 2. Self-help manual 3. Phone intervention 4. Manual plus nurse visits	Biochemically confirmed sustained quitting (salivary cotinine) at 6 months OR (versus control arm) 1.00; 1.53 (95% CI 0.68–3.42); 1.42 (95% CI 0.62–3.21); 1.81 (95% CI 0.69–4.73).	Differences in follow-up rates between groups.	Negative
Bull and Jamrozik (1998)	1. Brief advice 2. No advice	No between-group difference in self-reported PA at 1 year; 36% versus 31% physically active at 1 year.	Days of the week randomised rather than individual participants. Self-reported outcomes. Unusual definition of physically active.	Negative
García-Ortiz et al (2010)	1. Usual care 2. Brief advice with option of further session where exercise programme was prescribed	Generalised improvement in both groups with no significant difference between intervention and control groups (cardiovascular risk, blood pressure, smoking). Increased HDL-C (control 0.045 mmol/L versus intervention 0.069 mmol/L) and decreased atherogenic index (0.12 control versus 0.16 intervention, $P < 0.05$ ). No change in BMI or waist circumference.	Large number lost to follow-up. Practices randomised rather than individual participants. Participants were offered an additional session with a prescribed exercise programme (584 out of 1915 accepted) but all counted as “intervention”. No subgroup analysis.	Equivocal
Goldstein et al (1999)	1. Brief activity counselling 2. Standard care	Proportion meeting activity recommendations, self-reported (30 minutes 5 days per week) OR=1.37 (95% CI 0.77–2.43).	Seventy per cent of control practices regularly provided PA advice. Baseline assessment may have highlighted the need to increase PA.	Positive
Grandes et al (2009)	1. Advice 2. Advice and activity prescription 3. Usual care	Self-reported PA. Increase of 22.5 minutes per week in participants aged over 50 years. No significant difference in participants under 50 years in advice group compared with control in prescription group. Results similar.	Large numbers lost to follow-up, sub-group analyses.	Equivocal
Grandes et al (2011)	1. Advice 2. Advice with exercise prescription 3. Usual care	Overall improvement in both groups. No significant difference at 24 months between brief advice and control when exercise prescription group removed.	Brief advice with repeat exercise prescription improved exercise levels but significance was lost by 24 months. Significantly more participants achieved minimum recommended exercise at 24 months. Fifteen per cent were lost to follow-up. Self-reported activity outcomes. All participants in the advice arm were offered exercise prescription; therefore, they were a self-selecting group.	Equivocal
Harland et al (1999)	1. One interview 2. Six interviews 3. Exercise vouchers 4. Control group	Self-reported increases in activity not maintained at 1 year; improved PA scores seen in 38% versus 16% interventions versus controls $P = 0.001$ at 12 weeks.	Self reported PA, 20% drop-out rate, baseline assessment may have diluted intervention.	Negative

CI=confidence interval; CV=cardiovascular; ES=exercise specialist; ESP=exercise specialist plus pedometer; HDL-C=high-density lipoprotein cholesterol; OR=odds ratio; PA=physical activity.

**Table 2 (continued). Results of brief lifestyle advice intervention trials.**

Trial	Study groups	Outcome	Problems	Overall effect of brief lifestyle advice
Jimmy and Martin (2005)	1. Brief GP advice feeding back a PA questionnaire 2. 45-minute counselling	Self-reported PA about 50% active at 14 months in both groups $P=0.95$ .	Blinding of researcher collecting follow-up data. Randomisation not equal.	Positive
Koelwijn-van Loon et al (2010)	1. Usual care 2. Two 20-min consultations plus telephone conversation	Generalised improvement in both arms (primary outcomes) – no significant difference. Subgroup analysis showed increase in fruit consumption by people with diabetes in the intervention group but this was reversed in those without diabetes. The appropriateness of anxiety score in the intervention group was 6 times greater than control group (95% CI= 2.13–17.11). There was a higher level of patient satisfaction in intervention group.	Nurses were not blinded at assessment of CV risk. Outcome measures were self reported. Subgroup analysis. Sixty-seven lost to follow-up at 12 weeks. Short follow-up.	Positive
Lancaster et al (1999)	1. Brief advice 2. Advice plus follow-up counselling from nurse	Biochemically measured smoking cessation (cotinine), quit rates 3.6% versus 4.4%, difference of $-0.8\%$ (95% CI $-4.3, 2.6$ ).	Twenty-five per cent lost to follow-up.	Equivocal
Little et al (2004)	1. GP advice 2. Nurse counselling 3. Leaflet	No significant change in 6-minute walk test in single intervention groups.	Assessors not blinded.	Negative
Marshall et al (2005)	1. Brief general PA advice 2. No advice	Proportion of physically active at 6 months was 46.8% versus 29.9%, OR 2.05 (95% CI 1.33–3.16; $P=0.001$ )	Self-reported activity. Only one third received written materials.	Positive
Petrella et al (2003)	1. Brief advice 2. Exercise advice and assessment	Improvement in $VO_2$ max compared with brief advice 22.8 versus 24.9 ml/kg/min $P<0.001$	Unclear how randomisation of practices was performed.	Negative
Pieterse et al (2001)	1. Brief advice 2. Usual care	Quit rate at 12 months 13.4% versus 7.3%.	Self-reported quitting. No biochemical validation. High quit rate in control group, possibly owing to the “Hawthorne effect”. Unbalanced groups at baseline in terms of number of cigarettes smoked and level of motivation to quit.	Positive
Sacerdote et al (2006)	1. 15-minute intervention 2. Sham intervention	Net increase in portions of fruit and vegetables per week, OR 1.31 (95% CI 0.90–4.39)	Incomplete blinding of GPs. Self-reported outcome measures.	Positive
Stephoe et al (1999)	1. Behavioural counselling 2. Standard advice	Change in number of exercise sessions in past 4 weeks, OR 3.9 (95% CI 1.0–6.8).	High number lost to follow-up. Large differences in recruitment of control and intervention participants.	Negative
Swinburn et al (1998)	1. Brief advice plus written materials 2. Brief advice alone	Proportion of participants who increased their activity was 73% versus 63% ( $P=0.02$ ).	Recruitment was based on those who GPs thought would benefit from the intervention. Self-reported activity.	Positive
van Sluijs et al (2005)	1. Brief advice 2. Physician-based assessment and counselling for exercise	Increase in activity in all participants at 1 year of 61.6 minutes per week (95% CI 7.5–115.6), no between-group differences.	Self-reported activity.	Positive

CI=confidence interval; CV=cardiovascular; HDL-C=high-density lipoprotein cholesterol; OR=odds ratio; PA=physical activity.

In some instances a variety of approaches were tested in the same trial.

In the majority of trials the advice was provided by a GP, with fewer studies choosing a nurse to deliver the intervention. Most advice was supplemented by written materials.

Follow-up varied between 1 and 24 months, with the majority collecting data for between 6 and 12 months.

The quality of the studies included was generally good. The most common reason for being awarded a low score was selection bias after trial entry, with many studies reporting high losses to follow-up.

### Effectiveness of brief lifestyle advice

A summary of the results of the 19 studies included in this review is shown in *Table 2*. Overall, in the 10 studies that compared brief lifestyle advice with more intensive advice, three studies demonstrated that brief advice could be as effective as more intensive advice, six studies showed that brief advice was not as effective as more intensive advice and one study produced an equivocal result. In the 10 studies that examined the provision of brief lifestyle advice compared with the provision of usual care or no advice, six showed a positive result for the effectiveness of brief lifestyle advice, one showed a negative result and three showed equivocal results. (Please note that one of the studies [Harland et al, 1999] had brief, intensive and control arms and was therefore considered in both the groups of 10 studies above.) These results need to be qualified against the fact that in the vast majority of the studies included, outcome measures relied on self-reported behaviours. In addition, in many of the studies, follow-up of participants was not ideal with few studies being able to collect data on more than 80% of participants at follow-up. There were also too few studies that examined the impact of the provision of advice concerning more than one behaviour to draw any useful conclusions concerning this approach.

### Discussion

The evidence for the effectiveness of brief intervention in primary care remains unclear. Several studies suggest that there may be some health benefits associated with the provision of brief lifestyle advice and that brief lifestyle advice may be nearly as effective as more intensive regimens, particularly in the short term. The findings of this review are broadly in

keeping with those of the UK Health Development Agency. In its evidence briefing for brief interventions aimed at increasing physical activity levels (Hillsdon et al, 2005) the agency concludes that at the present time the evidence suggests that a single episode of brief tailored advice with some follow-up can increase physical activity, at least in the short term (Hillsdon et al, 2005). This briefing goes on to highlight various components that were associated with the greatest likelihood of success. These included the provision of tailored information delivered verbally with written support, setting goals, self-monitoring, exploring beliefs about physical activity, ongoing verbal support, providing occasional reviews, promoting moderate-intensity activity such as walking and no requirement for attending a facility (Hillsdon et al, 2005).

The evidence that brief lifestyle advice may be no less effective than more intensive advice is encouraging for more widespread adoption in routine clinical practice, particularly in primary care. The time pressures on primary care practitioners are increasingly being recognised and there now seems to be an acknowledgement that studies attempting to deliver lifestyle advice in primary care need to develop interventions that can be delivered in just a few minutes (Screening and Intervention Programme for Sensible drinking [SIPS], 2008). In addition, more robust studies are being conducted to further evaluate brief lifestyle advice in comparison with a more intensive intervention.

One of the major shortcomings of many of the studies reviewed is the lack of objective measures of behaviour, with many relying on self-reported information. There is a clear need for robust objective outcome measures of behaviour to be included in randomised trials of lifestyle interventions and not just intermediate measures (for example, intention to change behaviour and thoughts about the need to change behaviour), as have often been used in the past (Ashenden et al, 1997). Physical activity can be measured objectively using pedometers or accelerometers. Serum cotinine (Jarvis et al, 2003) is a reliable indicator of tobacco smoked and plasma vitamin C provides a robust estimate of fruit and vegetable intake (Khaw et al, 2001).

One of the authors recently carried out a pilot randomised controlled trial analysing the effect of brief intervention as well as communicating personalised cardiovascular health risk on physical activity (Price

### Page points

1. Overall, in the 10 studies that compared brief lifestyle advice with more intensive advice, three studies demonstrated that brief advice could be as effective as more intensive advice, six studies showed that brief advice was not as effective as more intensive advice and one study produced an equivocal result.
2. These results need to be qualified against the fact that in the vast majority of the studies included, outcome measures relied on self-reported behaviours.
3. Several studies suggest that there may be some health benefits associated with the provision of brief lifestyle advice and that brief lifestyle advice may be nearly as effective as more intensive regimens, particularly in the short term.

### Page points

1. The methods used to study lifestyle interventions need to adapt in order to increase the evidence base for the success of lifestyle interventions. Many studies were excluded from this review because they did not use a randomised design.
2. It is possible that over recent years the need to provide lifestyle advice may have diminished because of better knowledge among the population about healthy lifestyle choices.
3. These studies confirm that while much effort has been expended on increasing the health of the nation and increasing awareness of what constitutes a healthy lifestyle, there remains a significant proportion of the population who are unaware of rudimentary health messages (the benefits of not smoking, participating in physical activity, eating a low-fat, high-fibre diet containing plenty of fruit and vegetables and consuming alcohol in moderation).

et al, 2011). This trial followed 194 adults with an increased risk of cardiovascular disease. Participants were randomised to receive an estimation of their 10-year cardiovascular risk and then randomised again to receive a 15-minute brief intervention reinforced with written materials. The primary endpoint was activity measured with an accelerometer. Further endpoints included weight, blood pressure, high-density lipoprotein cholesterol, serum cotinine in smokers, triglyceride levels and further estimated 10-year risk.

There were no significant differences between individuals allocated to receive brief intervention versus those receiving no intervention in most primary or secondary end points. Men had a 2.6% decreased waist circumference ( $P=0.006$ ) but there was no difference in women. There was a 7.9% reduction in serum cotinine in smokers ( $P=0.028$ ) and a 10.2% decrease in triglycerides ( $P=0.02$ ; Price et al, 2011).

The methods used to study lifestyle interventions need to adapt in order to increase the evidence base for the success of lifestyle interventions. Many studies were excluded from this review because they did not use a randomised design.

The 1997 systematic review of lifestyle advice published by Ashenden and colleagues highlighted many of these issues and the inability to draw firm conclusions from the studies conducted up until then (Ashenden et al, 1997). Disappointingly, heterogeneous outcome measures, outcomes measured by self-report and non-randomised trial designs still plague this area of research. Future studies need to address these issues in their trial design.

It is possible that over recent years the need to provide lifestyle advice may have diminished because of better knowledge among the population about healthy lifestyle choices. However, despite the Government's focus on improving the health of the population in recent years, the evidence suggests that public perceptions of what constitutes a healthy lifestyle and which behaviours are unhealthy remain poor. In one UK survey of 512 adults aged 17–45 years, 25% of responders were current smokers yet only 4% recalled being advised to quit smoking (Duaso and Cheung, 2002). When asked what were their main sources of health promotion information, 67% of study participants cited magazines and 47% television. In younger people the Internet appears to be an important source of lifestyle advice (Humphreys and Costarelli, 2008).

In another study of 390 adults with and 190 without cardiovascular disease (CVD) risk factors that aimed to determine which factors predict recall of lifestyle advice, those with CVD risk factors, men and older participants were the most likely to recall that they had been given lifestyle advice (Little et al, 1999). Those able to recall lifestyle advice were more likely to report a healthier current lifestyle than those who could not recall lifestyle advice. It is of concern that 30–50% of responders who reported an unhealthy lifestyle were unaware that it was unhealthy. This study included adults from a wide range of socioeconomic backgrounds. Even in high-risk individuals, recollection of lifestyle advice can be poor. In a study of over 3000 people who had been hospitalised with heart failure and received lifestyle advice during their admission, only 46% of them could recall receiving the lifestyle advice (Lainscak et al, 2007).

These studies confirm that while much effort has been expended on increasing the health of the nation and increasing awareness of what constitutes a healthy lifestyle, there remains a significant proportion of the population who are unaware of rudimentary health messages (the benefits of not smoking, participating in physical activity, eating a low-fat, high-fibre diet containing plenty of fruit and vegetables and consuming alcohol in moderation). In view of these findings, it is important that research continues to be conducted to investigate approaches to educating the population about healthy behaviours.

### Conclusion

As diseases such as obesity and type 2 diabetes continue to increase in prevalence they present a growing challenge to 21<sup>st</sup> Century healthcare professionals. The pathophysiology and therapeutic options for these conditions are increasingly well understood. Modifiable lifestyle factors such as smoking, diet, alcohol and exercise would appear to be more straightforward targets for intervention. Despite the shortcomings of the available data as one of the studies concludes (Lancaster et al, 1999), brief lifestyle advice may result in some benefits in particular groups of people and rarely results in adverse outcomes. It can be used as a useful adjunct in clinical care. It is, however, clear that insufficient data exist to champion this method at the expense of other more evidence-based interventions. ■



- Armit CM, Brown WJ, Marshall AL et al (2009) Randomized trial of three strategies to promote physical activity in general practice. *Prev Med* **48**: 156–63
- Ashenden R, Silagy C, Weller D et al (1997) A systematic review of the effectiveness of promoting lifestyle change in general practice. *Fam Pract* **14**: 160–76
- Aveyard P, Griffin C, Lawrence T, Cheng KK (2003) A controlled trial of an expert system and self-help manual intervention based on the stages of change versus standard self-help materials in smoking cessation. *Addiction* **98**: 345–54
- Bailey V, Soni A, Alessi C et al (2011) *The NHS's role in the public's health. A Report From the NHS Future Forum*. Department of Health, London
- Barengo NC, Hu G, Lakka TA et al (2004) Low physical activity as a predictor for total and cardiovascular disease mortality in middle-aged men and women in Finland. *Eur Heart J* **25**: 2204–11
- Boekholdt SM, Meuwese MC, Day NE et al (2006) Plasma concentrations of ascorbic acid and C-reactive protein, and risk of future coronary artery disease, in apparently healthy men and women: the EPIC-Norfolk prospective population study. *Br J Nutr* **96**: 516–22
- British Medical Association, NHS Employers (2009) *Quality and Outcomes Framework Guidance for GMS Contract 2009/10*. Delivering Investment in General Practice. NHS Employers, London. Available at: <http://bit.ly/91aRVv> (accessed 14.05.12)
- Bull FC, Jamrozik K (1998) Advice on exercise from a family physician can help sedentary patients to become active. *Am J Prev Med* **15**: 85–94
- Calías KJ, Long BJ, Sallis JF et al (1996) A controlled trial of physician counseling to promote the adoption of physical activity. *Prev Med* **25**: 225–33
- Duaso MJ, Cheung P (2002) Health promotion and lifestyle advice in a general practice: what do patients think? *J Adv Nurs* **39**: 472–9
- Enkin M, Keirse M, Neilson J et al (2000) *Guide to Effective Care in Pregnancy and Childbirth* (3rd edn). Oxford University Press, Oxford
- Foerster M, Marques-Vidal P, Gmel G et al (2009) Alcohol drinking and cardiovascular risk in a population with high mean alcohol consumption. *Am J Cardiol* **103**: 361–8
- García-Ortiz L, Grandes G, Sánchez-Pérez A et al (2010) Effect on cardiovascular risk of an intervention by family physicians to promote physical exercise among sedentary individuals. *Rev Esp Cardiol* **63**: 1244–52
- Goldstein MG, Pinto BM, Marcus BH et al (1999) Physician-based physical activity counseling for middle-aged and older adults: a randomized trial. *Ann Behav Med* **21**: 40–7
- Gordon T, Kannel WB, McGee D, Dawber TR (1974) Death and coronary attacks in men after giving up cigarette smoking. A report from the Framingham study. *Lancet* **2**: 1345–8
- Grandes G, Sanchez A, Sanchez-Pinilla RO et al (2009) Effectiveness of physical activity advice and prescription by physicians in routine primary care: a cluster randomized trial. *Arch Intern Med* **169**: 694–701
- Grandes G, Sanchez A, Montoya I et al (2011) Two-year longitudinal analysis of a cluster randomized trial of physical activity promotion by general practitioners. *PLoS One* **6**: e18363
- Hakim AA, Petrovitch H, Burchfiel CM et al (1998) Effects of walking on mortality among nonsmoking retired men. *N Engl J Med* **338**: 94–9
- Harland J, White M, Drinkwater C et al (1999) The Newcastle exercise project: a randomised controlled trial of methods to promote physical activity in primary care. *BMJ* **319**: 828–32
- Hillsdon M, Foster C, Cavill N et al (2005) *The Effectiveness of Public Health Interventions for Increasing Physical Activity Among Adults: A Review of Reviews* (2nd edn). Health Development Agency, London
- Hu FB, Willett WC, Li T et al (2004) Adiposity as compared with physical activity in predicting mortality among women. *N Engl J Med* **351**: 2694–703
- Humphreys L, Costarelli V (2008) Implementation of dietary and general lifestyle advice among women with polycystic ovarian syndrome. *J R Soc Promot Health* **128**: 190–5
- Jarvis MJ, Primates P, Erens B et al (2003) Measuring nicotine intake in population surveys: comparability of saliva cotinine and plasma cotinine estimates. *Nicotine Tob Res* **5**: 349–55
- Jimmy G, Martin BW (2005) Implementation and effectiveness of a primary care based physical activity counselling scheme. *Patient Educ Couns* **56**: 323–31
- Khaw KT, Bingham S, Welch A et al (2001) Relation between plasma ascorbic acid and mortality in men and women in EPIC-Norfolk prospective study: a prospective population study. European Prospective Investigation into Cancer and Nutrition. *Lancet* **357**: 657–63
- Koelewijn-van Loon MS, van der Weijden T, Ronda G et al (2010) Improving lifestyle and risk perception through patient involvement in nurse-led cardiovascular risk management: a cluster-randomized controlled trial in primary care. *Prev Med* **50**: 35–44
- Kreuter MW, Chheda SG, Bull FC (2000) How does physician advice influence patient behavior? Evidence for a priming effect. *Arch Fam Med* **9**: 426–33
- Lancaster T, Dobbie W, Vos K et al (1999) Randomized trial of nurse-assisted strategies for smoking cessation in primary care. *Br J Gen Pract* **49**: 191–4
- Lansley A (2012) *Response to the NHS Future Forum's Second Report*. Department of Health, London. Available at: <http://bit.ly/IQIB34> (accessed 14.05.12)
- Lainscak M, Cleland JG, Lenzen MJ et al (2007) Recall of lifestyle advice in patients recently hospitalised with heart failure: a EuroHeart Failure Survey analysis. *Eur J Heart Fail* **9**: 1095–103
- Lewis BS, Lynch WD (1993) The effect of physician advice on exercise behavior. *Prev Med* **22**: 110–21
- Little P, Slocock L, Griffin S, Pillinger J (1999) Who is targeted for lifestyle advice? A cross-sectional survey in two general practices. *Br J Gen Pract* **49**: 806–10
- Little P, Dorward M, Gralton S et al (2004) A randomised controlled trial of three pragmatic approaches to initiate increased physical activity in sedentary patients with risk factors for cardiovascular disease. *Br J Gen Pract* **54**: 189–95
- Liu S, Manson JE, Lee IM et al (2000) Fruit and vegetable intake and risk of cardiovascular disease: the Women's Health Study. *Am J Clin Nutr* **72**: 922–8
- Manson JE, Greenland P, LaCroix AZ et al (2002) Walking compared with vigorous exercise for the prevention of cardiovascular events in women. *N Engl J Med* **347**: 716–25
- Marshall AL, Booth ML, Bauman AE (2005) Promoting physical activity in Australian general practices: a randomised trial of health promotion advice versus hypertension management. *Patient Educ Couns* **56**: 283–90
- Myint PK, Luben RN, Welch AA et al (2008) Plasma vitamin C concentrations predict risk of incident stroke over 10 y in 20 649 participants of the European Prospective Investigation into Cancer Norfolk prospective population study. *Am J Clin Nutr* **87**: 64–9
- Petrella RJ, Koval JJ, Cunningham DA, Paterson DH (2003) Can primary care doctors prescribe exercise to improve fitness? The Step Test Exercise Prescription (STEP) project. *Am J Prev Med* **24**: 316–22
- Pieterse ME, Seydel ER, DeVries H et al (2001) Effectiveness of a minimal contact smoking cessation program for Dutch general practitioners: a randomized controlled trial. *Prev Med* **32**: 182–90
- Price HC, Griffin SJ, Holman RR et al (2011) Impact of personalized cardiovascular disease risk estimates on physical activity—a randomized controlled trial. *Diabet Med* **28**: 363–72
- Sacerdote C, Fiorini L, Rosato R et al (2006) Randomized controlled trial: effect of nutritional counselling in general practice. *Int J Epidemiol* **35**: 409–15
- Screening and Intervention Programme for Sensible drinking (2008) SIPS Brief Advice Training. Available at: <http://bit.ly/IQH1OG> (accessed 14.05.12)
- Step toe A, Doherty S, Rink E et al (1999) Behavioural counselling in general practice for the promotion of healthy behaviour among adults at increased risk of coronary heart disease: randomised trial. *BMJ* **319**: 943–7
- Swinburn BA, Walter LG, Arroll B et al (1998) The green prescription study: a randomized controlled trial of written exercise advice provided by general practitioners. *Am J Public Health* **88**: 288–91
- van Sluijs EM, van Poppel MN, Twisk JW et al (2005) Effect of a tailored physical activity intervention delivered in general practice settings: results of a randomized controlled trial. *Am J Public Health* **95**: 1825–31

**“These studies confirm that while much effort has been expended on increasing the health of the nation and increasing awareness of what constitutes a healthy lifestyle, there remains a significant proportion of the population who are unaware of rudimentary health messages. In view of these findings, it is important that research continues to be conducted to investigate approaches to educating the population about healthy behaviours.”**