PRACTICE OBSERVED

Practice Research

District programme to reduce smoking: effect of clinic supported brief intervention by general practitioners

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Abstract

By encouraging and supporting general practitioners to undertake brief intervention on a routine basis smokers' clinics could reach many more smokers than are willing to attend for intensive treatment. In a study with 101 general practitioners from 27 practices 4445 cigarette smokers received brief intervention with the support of a smokers' clinic, brief intervention without such support, or the general practitioners' usual care. At one year follow up the numbers of smokers who reported that they were no longer smoking cigarettes were 51 (13%), 63 (9%), and 263 (8%), respectively ($p<0.005$). After an adjustment was made for those cases not validated by urine cotinine concentrations the respective success rates were 8%, 5%, and 5%.

Use of nicotine chewing gum was associated with higher self reported success rates. General practitioners providing supported brief intervention encouraged not only more smokers to use the gum but also more effective use; gum users in this group reported a success rate of 27% at one year. Compliance by the general practitioners in recording smoking state averaged 45%, and significantly higher success rates were reported by patients whose smoking state had been recorded.

Brief intervention by general practitioners with the support of a smokers' clinic thus significantly enhanced success rates based on self reports. Better results might be obtained if general practitioners' compliance with the procedure could be improved and if they encouraged more of their patients to try nicotine gum. Collaboration of this kind between a smokers' clinic and local general practitioners could deliver effective help to many more smokers than are likely to be affected if the two continue to work separately.

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Introduction

Antismoking publicity and campaigns in the mass media have been based mainly on educational approaches to inform the public of the risk of smoking. They have had some success; in Britain the prevalence of smoking has been declining, especially over the past 10 years, and most smokers now want to stop. A large proportion of them are, however, dependent on the habit, and, even though they want to stop smoking and try to do so, only one in three smokers succeeds in stopping permanently before the age of 60.[1] Thus, many smokers may need additional help and guidance on how to overcome their dependence. In other words, educational methods may need to be supplemented with some form of support and treatment. But what form should this additional treatment take?

Conventional smokers' clinics can offer effective treatment, but they attract few smokers and therefore cannot provide help on the scale required to reduce the prevalence of smoking in a whole community.[2,3] Mass media campaigns and videotapes, however, are effective in motivating smokers to stop smoking but relatively ineffective in helping them to succeed.[4,5] Brief personal contact seems to be more effective; advice from a general practitioner helped a small, but appreciable, proportion (about 5%) of smokers to stop smoking, and the success rate doubled when the smokers were also offered nicotine chewing gum.[6-8] Many smokers consult their general practitioners each year, so general practitioners

collectively have the opportunity of giving them advice and help not only on a personal level but also on a large scale.

The purpose of this programme was to evaluate a wider role for smokers' clinics and to see whether by mobilising, supporting, and coordinating intervention by general practitioners and other health professionals in a district health authority it would be possible to reduce the prevalence of smoking in the whole community of the district. Emphasis was on brief interventions by the various staff in the health professions that could be incorporated into their normal contacts with smokers during the course of their work. The first priority was to develop an effective package to facilitate and support intervention by general practitioners and to make it sufficiently flexible to span the whole range of general practices from the keen to the reluctant. The second priority is to develop an intervention package for health visitors, and the next will be an approach for pharmacists.

We report here the results of a one year prospective study to assess the effect of a brief intervention procedure by general practitioners on the smoking habits of their patients. We will report later the cumulative effect of sustaining the intervention over 30 months.

Subjects and methods

DOCTORS

Altogether 101 doctors in 27 practices took part in the study, as well as their locums and assistants. In our local Camberwell district we approached all practices with three or more partners, the two largest practices with two partners, and one singlehanded practice which shared a health centre with other participating practices. Seventeen out of 21 practices approached agreed to take part; seven were willing to undertake brief intervention with clinic support (group A), four opted for brief intervention without clinic support (group B), and six agreed to work as usual (controls; group C). Twelve group practices in south Hammersmith were asked to take part as controls, and 10 agreed (group D). Use of a control district (south Hammersmith) was not essential for the present study but was necessary for the long term aims of the programme. In most cases the few practices who did not take part gave good reasons. No attempt was made to select the better organised practices or those with an interest in research; the practices were therefore fairly representative of inner London group practices, though not of single handed and two handed practices. We would have preferred to assign the practices in Camberwell randomly to groups A, B, and C, but the number of practices willing to undertake brief intervention with clinic support was too small; thus assignment to the groups was selected by each practice, which required the inclusion of within practice controls into the design (see below).

PATIENTS

The target samples comprised all cigarette smokers aged 16 or more who attended the surgeries to see a doctor over designated two week periods during October and November 1982. Cigarette smokers were identified by their response on a self completion questionnaire given to them by the receptionists. Those who responded "yes" to the question, "Do you smoke cigarettes?" were included in the study. Of the 4888 smokers recruited, 443 died or moved to an unknown address during the year of follow up. The analysis was based on the 4445 smokers available for follow up, of whom 3193 (72%) provided adequate data at one year. Non-respondents were counted as continuing smokers.

Demographic data were missing in some cases. The average age of the sample was 41 (SD 16·6) (n=4349); 65% (2855 out of 4423) of the subjects were women, 18% (583 out of 3187) were from social classes I and II, and the average number of cigarettes smoked daily was 17 (SD 10·1) (n=4341). None of these characteristics differed significantly among practice groups or intervention conditions.

DESIGN AND ASSIGNMENT TO INTERVENTION GROUP

As we could not assign practices in Camberwell randomly to the three intervention conditions (supported brief intervention, brief intervention, and usual care) we provided within practice controls. Thus practices in group A recruited subjects for all three conditions and practices in group B recruited subjects for brief intervention and usual care. It would have been difficult for these practices to recruit subjects in a balanced order to each of the intervention conditions, so a bias is possible; the earlier recruitment periods would have been overrepresented by frequent attenders as subjects who reattended were not counted again but remained assigned to the condition given at their first attendance. Table I shows the design of the study and the numbers of smokers assigned to the three intervention conditions; practices in group A and group B provided within practice comparisons to supplement the analyses of the total sample.

TABLE I—*Study design showing numbers of smokers recruited, numbers available for follow up, and numbers responding at one year follow up, by practice group and type of intervention. Dates in parentheses refer to recruitment periods*

Practice group	Usual care (5-18 October)	Brief intervention (26 Oct-8 Nov)	Supported brief intervention (10-25 November)*
Group A (seven practices):			
No recruited	929	513	429
No available for follow up	832	469	396
No (%) responding at 1 year	632 (76)	338 (72)	270 (68)
Group B (four practices):			
No recruited	560	277	
No available for follow up	533	260	
No (%) responding at 1 year	378 (71)	164 (63)	
Group C (six practices)†:			
No recruited	757		
No available for follow up	683		
No (%) responding at 1 year	493 (72)		
Group D (10 practices)†:			
No recruited	1423		
No available for follow up	1272		
No (%) responding at 1 year	919 (72)		
Groups A, B, C, and D:			
No recruited	3669	790	429
No available for follow up	3320	729	396
No (%) responding at 1 year	2422 (73)	502 (69)	270 (68)

*Recruitment period was extended by two days to recruit more smokers.
†Smokers were recruited over two separate weeks (5-11 October and 17-23 November) rather than two consecutive weeks.

INTERVENTION AND CONTROL PROCEDURES

Control subjects received the doctors' usual care, which in some cases may have included active advice and help to stop smoking. For both intervention procedures doctors (*a*) noted the smoking habits of all adult patients attending their surgeries; (*b*) advised all cigarette smokers to stop; (*c*) gave them a leaflet about smoking and how to give it up; and (*d*) offered nicotine chewing gum (on private prescription) to those who felt unable to stop without something to help. Those who accepted the gum were also given a manufacturer's booklet explaining how it should be used.

For patients assigned to brief intervention only the doctors recorded smoking state in their own handwriting in the patients' notes and received no back up or support from the smokers' clinic. They were, however, given special folders containing the materials and guidance on the protocol to keep on their desks. For patients assigned to supported brief intervention there was continuing support and back up for the doctors from the smokers' clinic, including special smoker/non-smoker labels for the patients' notes with space for follow up attendances, a leaflet about the smokers' clinics available in the district, and reply paid postcards for referral by the general practitioner and self referral to the clinic of the patient's choice. These materials with appropriate instructions were put in a convenient folder for the doctors' desks, which was slightly more glossy than those used for the brief intervention procedure. Finally, we designed a series of five brightly coloured posters about the risks of smoking for use in the waiting rooms of practices undertaking supported brief intervention. The periodic changing of posters and renewal of other materials were used as opportunities for staff in the smokers' clinic to maintain personal contact with the staff and doctors of the practices giving supported brief intervention and to remind and encourage them to persist with the procedures. These practices also received a personal letter every three to four months from the consultant in charge of the smokers' clinic.

Uniike previous studies, in which intervention was applied only briefly to single cohorts of patients,[6-8] we wanted to assess the cumulative effect of sustaining the intervention for several years. Thus practices in group A continued with supported brief intervention and practices in group B with brief intervention after the cohorts of patients shown in table I had been recruited. Although the patients' notes were labelled to alert the doctors to each patient's intervention condition, any patients receiving usual care or

brief intervention who reattended practices in group A during the ensuing year would have been exposed to the posters at least.

QUESTIONNAIRES AND FOLLOW UP

A short "smoking record card" was given out by the receptionists to all patients, who completed it while waiting to see their doctor. Apart from details of name, address, age, sex, and occupation, it contained four questions on past and present smoking habits. Equally brief one page questionnaires headed "smoking survey" were posted to the subjects identified as smokers after six months and one year with personalised covering letters from their doctors. A freepost return envelope addressed to their doctor was also enclosed. Non-respondents received two further mailings and at one year follow up a third mailing by recorded delivery.

GENERAL PRACTITIONERS' COMPLIANCE

After the one year follow up checks were made on the extent to which the general practitioners had complied with the intervention protocols. These included checking for records of smoking state in patients' notes, checking the doctors' desks for the intervention folders, and analysing the use of the clinic referral cards by both doctors and patients.

BIOCHEMICAL VALIDATION

Several general practitioners were reluctant for us to attempt biochemical validation in all patients who claimed to have stopped smoking cigarettes at one year follow up and for us to pursue non-respondents in any way. We opted therefore to obtain a rough estimate of the overall deception rate by urinary cotinine analysis in a subsample of the subjects, concentrations above 50 μg/l being regarded as inconsistent with non-smoking. Jarvis *et al* showed this concentration to be the cut off point for maximal sensitivity (97%) and specificity (99%) in patients attending a cardiovascular clinic.[9] For operational reasons and interruption by Christmas holidays the validations were conducted three months after the one year follow up. Half of those who claimed not to be smoking at one year were taken at random and asked, by letter with one reminder, to attend their doctor's surgery to provide urine specimens as part of a screening survey for urinary abnormalities. The urine samples were tested for glucose and protein, but the patients were not aware that they were also tested for cotinine concentration. The response rate and deception rate were therefore unlikely to be biased by any knowledge that the test was linked to smoking. We considered this approach to be justified because the staff in the practices were not told who failed validation as a non-smoker and the researchers did not know or meet the patients.

STATISTICAL ANALYSES

All analyses were based on a full logistic linear model using the GLIM and SAS statistical packages[10,11] to allow for the self selection of practices to intervention or control groups, for the sequential assignment of subjects to the different interventions in groups A and B, and for differences between practices within each group. Variables included in the model and adjusted for when appropriate were: practices, practice groups, level of intervention, age, sex, social class, and daily cigarette consumption. As no studies had ever shown a negative effect of intervention by general practitioners sample sizes were designed to have statistical power to test the one sided hypothesis that increasing levels of intervention result in higher rates of success.

Results

OUTCOME

Table II shows the self reported progress in stopping smoking at six months and one year. There was a clear and significant effect of intervention on outcome at both six months and one year, which was mainly due to the effect of supported brief intervention. The results of the brief intervention group were similar to those of the usual care controls, and no difference was detected between them in any of the measures of outcome. The success rates of the supported brief intervention group, however, were about 50% higher than those of the two other groups combined on all the measures with the exception of the rate of relapse after six months. In comparison with the brief intervention group alone significantly more smokers in the supported brief intervention group stopped smoking after six months ($\chi^2=4{\cdot}4$, $p<0{\cdot}025$) and more were not smoking at one year ($\chi^2=5{\cdot}7$, $p<0{\cdot}01$).

TABLE II—*Results of self reported changes in smoking behaviour six months and one year after starting intervention. Values are numbers of smokers (percentages)*

Self reported changes*	Usual care (n=3320)	Brief intervention (n=729)	Supported brief intervention (n=396)	Significance†‡
Not smoking at six months	200 (6)	49 (7)	36 (9)	(*a*) $\chi^2_L=3{\cdot}9$, $p<0{\cdot}025$ (*b*) $\chi^2=4{\cdot}4$, $p<0{\cdot}025$
Relapse rate between six months and one year	85/200 (43)	22/49 (45)	15/36 (42)	(*a*) $\chi^2_L<0{\cdot}1$ $p>0{\cdot}1$ (*b*) $\chi^2<0{\cdot}1$ $p>0{\cdot}1$
Not smoking at six months and one year	115 (4)	27 (4)	21 (5)	(*a*) $\chi^2_L=2{\cdot}4$, $p<0{\cdot}07$ (*b*) $\chi^2=3{\cdot}0$, $p<0{\cdot}05$
Smoking at six months but not smoking at one year	148/3120 (5)	36/680 (5)	30/360 (8)	(*a*) $\chi^2_L=5{\cdot}2$, $p<0{\cdot}025$ (*b*) $\chi^2=6{\cdot}7$, $p<0{\cdot}005$
Total not smoking at one year	263 (8)	63 (9)	51 (13)	(*a*) $\chi^2_L=7{\cdot}4$, $p<0{\cdot}005$ (*b*) $\chi^2=9{\cdot}4$, $p<0{\cdot}003$

*Non-respondents were counted as continuing smokers.
†Although the logistic linear model adjusted for significant covariate effects, the unadjusted figures are shown.
‡(*a*) $\chi^2_L=\chi^2$ For linear trend across the three conditions; (*b*) $\chi^2=\chi^2$ for usual care plus brief intervention *v* supported brief intervention.

The overall pattern of the results was that brief intervention had no detectable effect on outcome, whereas supported brief intervention increased significantly the rate of stopping smoking reported during both the first and second six months of the follow up year. Although supported brief intervention had no significant effect on reducing the relapse rate of those who had stopped in the first six months, it had a small effect in increasing the proportion who reported that they were not smoking at both six months and one year.

Although supported brief intervention depended on the willingness of the general practitioners to provide it, the statistical methods used and the inclusion of within practice controls make it unlikely that the effects on outcome were due to self selection factors. To illustrate this, when the analysis was confined to practices in group A the proportions of smokers who were not smoking at one year were 8%, 10%, and 13% for usual care, brief intervention, and supported brief intervention, respectively ($\chi^2_L=5{\cdot}9$, $p<0{\cdot}01$). The similarity in the outcome of usual care among the four practice groups also testifies to this: the proportions not smoking at one year were 8%, 7%, 8%, and 8% in groups A, B, C, and D, respectively.

USE OF NICOTINE GUM

Table III shows that only 449 (10%) patients reported having tried nicotine chewing gum during the year of follow up, but the two intervention procedures had a small significant effect in encouraging more smokers to try using it ($\chi^2_L=3{\cdot}7$, $p<0{\cdot}05$) (table III). Although the use of gum was associated with higher success rates, the effect was not significant in the usual care and brief intervention groups. In the supported brief intervention group, however, the success rate reported by gum users was more than double that reported by non-users, indicating that gum, when used, was used more effectively by smokers in this group.

TABLE III—*Numbers (percentages) of smokers in each intervention group using nicotine gum, and self reported success rates by gum use*

	Usual care (n=3320)	Brief intervention (n=729)	Supported brief intervention (n=396)
Smokers who used nicotine gum	320 (10)	81 (11)	48 (12)
Those not smoking at one year:			
Gum users	26/320 (8)	8/81 (10)	13/48 (27)
Non-users	237/3000 (8)	55/648 (9)	38/348 (11)
χ^2*	1·6	1·6	11·6
p	>0·1	>0·1	<0·001

*Statistical tests adjusted for cigarette consumption.

GENERAL PRACTITIONERS' COMPLIANCE

One check on the extent to which general practitioners carried out the intervention procedures was to see whether they had recorded their patients' smoking state or used the special labels for this purpose. We examined the notes of 436 of the 729 (60%) patients receiving brief intervention (groups A and B) and all 396 of the patients receiving supported brief intervention. Table IV shows the results. Compliance averaged 45% and was similar in the two groups. In both cases success rates were significantly higher when the notes had been appropriately recorded. After adjusting for intervention procedure and cigarette consumption compliance showed a significant effect ($\chi^2=8\cdot1$, df=1, $p<0\cdot003$). We found no interaction between compliance and intervention ($\chi^2=0\cdot5$), indicating that the effect of compliance did not differ significantly in the two intervention groups.

A second check conducted at the same visit was an inspection of the doctors' desks for the presence of the special intervention folders; 79% of folders for supported brief intervention and 45% of folders for brief intervention were found to be in place.

A final check on the general practitioners' compliance was on the use made of the clinic referral cards. Referral cards from the general practitioner were received for only 99 of the 396 (25%) smokers in the supported brief intervention group, and their success rate at one year was not significantly higher than that of the remaining 297 patients in this group (17% *v* 12%). The general practitioners' compliance fell during the year, with the receipt of referral cards for smokers not in the prospective cohort falling to about 60 a month over the last six months. Self referral cards were received from only 28 of the 396 (7%) smokers in the supported brief intervention group. This low response from patients may have been due in part to failure of their general practitioners to give them the cards. The success rate of the 28 responders was significantly higher than that of the remaining 368 patients after cigarette consumption was controlled for (25% *v* 12%; $\chi^2=5\cdot3$, $p<0\cdot02$) even though only 11 of them attended the clinic for treatment, of whom two were not smoking at the one year follow up.

TABLE IV—*General practitioners' compliance with labelling or recording of smoking state in patients' notes, and self reported success rates by general practitioners' compliance*

	Brief intervention (n=436)	Supported brief intervention (n=396)
No (%) of notes available for inspection	389 (89)	348 (88)
No (%) of available notes with smoking state recorded	179/389 (46)	150/348 (43)
No (%) not smoking at one year:		
Notes recorded	22/179 (12)	26/150 (17)
Not recorded	12/210 (6)	20/198 (10)

ADJUSTED ONE YEAR SUCCESS RATES

Among those who claimed to have stopped smoking at one year, 209 were asked to provide a urine sample and 157 (75%) complied. Ten of these were pipe or cigar smokers, and 57 of the remaining 147 (39%), who claimed to have stopped all smoking, exceeded the 50 μg/l cotinine cut off point. We did not ask about current use of nicotine gum, so we do not know how many patients may have failed validation as non-smokers for this reason.

Compliance with the test was significantly lower in the intervention groups, the proportions providing a urine sample being 80%, 68%, and 58% in the usual care, brief intervention, and supported brief intervention groups, respectively ($\chi^2=6\cdot3$, df=2, $p<0\cdot05$). There was also a tendency for the proportions who failed validation to be higher. Of those tested, the proportions exceeding the cotinine concentration cut off point were 37%, 38%, and 58%, respectively ($\chi^2=2\cdot1$, df=2, NS); the lack of significance was possibly due to the low number of patients tested in the supported brief intervention group (n=12). Similar trends in both these factors were evident in practices in group A, which provided within practice controls, though they did not reach significance.

Adjustments based on deception rates of the individual groups gave validated success rates of around 5% in all three groups. The numbers tested in each group, however, were rather small for reliable estimates on a within group basis, especially for the supported brief intervention group. Our limited validation procedure was designed to provide an average estimate across all three groups; using an overall deception rate of 39% for adjusting the self reports gave validated success rates at one year follow up of 5%, 5%, and 8% in the usual care, brief intervention, and supported brief intervention groups, respectively.

Discussion

The main purpose of this study was to develop a brief procedure for general practitioners as an intervention against smoking that could be incorporated into their routine contacts with patients and sustained indefinitely. Brief intervention given without the support and back up of the local smokers' clinic had no detectable advantage over general practitioners' usual care. The supported brief intervention procedure, however, significantly increased the success rate, and at one year 13% of smokers in this group claimed to have stopped smoking cigarettes compared with 8% of the controls given usual care. The supported brief intervention procedure seemed to help the general practitioners sustain their efforts throughout the year, and self reported rates of stopping smoking during the second six months were also significantly higher with supported brief intervention than with usual care. Use of nicotine chewing gum was associated with higher success rates. With the supported brief intervention procedure, not only did general practitioners encourage more patients to try the gum but when patients did use it they used it more effectively; the one year success rate reported by gum users in this group reached 27%.

We cannot identify the most effective elements in the supported brief intervention from this study. The compliance of the general practitioners in recording the smoking state of their patients was 45% and was not increased by the provision of special labels. These labels, however, may have reminded them to intervene again when the patients reattended, and this may account for the sustained effect of supported brief intervention throughout the year. The cards for referral to the smokers' clinic may have contributed to a small degree.

The lack of effect of brief intervention without the support of a smoker's clinic may seem surprising in view of reports of a significant effect with intervention of this kind.[6-8] One explanation is that in those earlier studies brief intervention was compared with non-intervention whereas we compared it with usual care, which for many general practitioners may include some counselling and help with smoking. The fact that 10% of smokers receiving usual care also obtained nicotine chewing gum supports this view.

The importance of biochemical validation of non-smoking state is shown by the high failure rate on urinary cotinine testing in smokers who claimed to have stopped smoking (57 out of 147 tested (39%)). Although other studies used higher cut off points of cotinine concentration than our value of 50 μg/l—for example, 100 μg/l[7]—this would have made little difference. The adjustments for non-validation made on a within group basis seem to have eroded completely the differences in self reported success rates in the intervention and control groups. This raises the question of whether the intervention had any long term effect on smoking behaviour. It may have affected mainly what the smokers reported and led those who misreported to avoid or fail biochemical validation. Before this pessimistic view is accepted, however, these findings would have to be confirmed by biochemical validation in all smokers who claimed to have given up smoking. We were unable to do this, and our estimates of deception are based on subsamples, which in some cases were small. In our view, therefore, the adjustments based on the overall deception rate are probably more reliable. Another consideration is that cotinine concentration may not be the best method of validation when prolonged use of nicotine gum is a possibility; we wanted to avoid linking the validation procedure with its true purpose so we did not question subjects about their current use of gum. Our results highlight the need for biochemical validation in the evaluation of smoking behaviour and cast doubts on studies that rely solely on self reports.

In conclusion, this study indicates that many general practitioners are willing to expend much time and effort in advising and helping their patients to stop smoking. It is important to ensure that this is time well spent. At present we cannot give them such assurance.

We thank the Department of Health and Social Security for most of the long term funding of this programme and the Medical Research Council for supporting the staff responsible for its design and analysis. We also thank Pamela Hancox and Sheila Lachhman for secretarial help. Above all, we thank all the general practitioners and their receptionists.

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(Accepted 27 August 1987)

Audit Report

Surveillance of body weight in general practice

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This department carried out an audit of the surveillance of body weight in one small general practice with a stable population, which had a policy of weighing adults every three years. We tried to answer three questions: How many patients were weighed? How common was overweight? How did body weight vary with time?

How many patients were weighed?—Over seven years 252 (78%) of the 323 adults over the age of 20 in the practice population had their weight recorded at least once and 149 patients (46%) at least twice. Although only 9% of women (three out of 32) over the age of 56 had not been weighed, half of the men (20 out of 40) aged 20-35 were missed. The 149 patients who were weighed at least twice in seven years weighed more on average (65·9 (SD 14·6) kg) than the 103 patients who were weighed only once (61·8 (12·6) kg).

How common was overweight?—Both height and weight were recorded in only 158 patients, who were heavier (65·7 (13·4) kg) than the 94 others (59·5 (12·2) kg). Body mass index (weight/height^2) was calculated for these 158 patients; 43 of them were unequivocally obese (body mass index >29), and a further 57 were overweight with a body mass index of 25-29. Seventeen out of 36 (47%) women aged 20-35 but all 29 women aged over 56 were overweight or obese.

How did body weight vary with time?—Of the 149 patients whose weight was recorded twice or more, 106 (71%) showed little change while the weight of 37 (25%) changed by 10%-20% and that of six (4%), including three patients with serious diseases, changed by over 20%.

Measuring weight at every visit unless last done in the past two years will mean that most patients will have their weight measured regularly, but younger men may often be missed. For effective surveillance, however, height needs to be measured as well as weight.

(Accepted 9 September 1987)

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