Multifaceted support to improve preventive cardiovascular care: a nationwide, controlled trial in general practice

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SUMMARY

Background: *Multifaceted interventions improve the quality of preventive cardiovascular care in general practice when applied in small-scale research trials.*

Aim: *To test the transferability of observations from research trials on preventive cardiovascular care to a real-world situation and, therefore, evaluate the effectiveness of a nationwide project with a large number of practices. The intervention comprised a combination of conferences, dissemination of manuals, and support from trained non-physicians during outreach visits.*

Design of study: *A controlled before-and-after trial with two arms: multifaceted support versus no special attention. Analysis after 2 years.*

Setting: *617 general practices in The Netherlands.*

Method: *Outcomes measures were the compliance rates for 15 indicators. Structure-of-care indicators included the use of reminders, specific computer files, written protocols, and special clinics. Process-of-care indicators included the assessment of modifiable risk factors and use of a minimal contact intervention (MCI) for smoking cessation. Compliance of general practitioners (GPs) was assessed using self-administered questionnaires.*

Results: *The intervention group improved on all eight of the structure-of-care indicators when compared to the control group. A positive effect was also found on the extent to which the GPs measured blood pressure in 60-year-old patients and on the use of an MCI for smoking cessation. No effect was found on the completeness of the risk-factor profiles that the GPs assessed in specific groups of high-risk patients.*

Conclusion: *The nationwide intervention appeared to improve certain aspects of preventive cardiovascular care. Nevertheless, the National Association of GPs decided to stop the project. This decision was made within the context of discussions about the heavy workloads and insufficient incomes being experienced by GPs.*

Keywords: *cardiovascular disease; prevention and control; quality of health care; family practice.*

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Submitted: 3 February 2003; Editor's response: 14 June 2003; final acceptance: 29 July 2003.

Introduction

GENERAL practitioners (GPs) should pay special attention to the assessment of cardiovascular risk factors in patients at high cardiovascular risk. It has been argued that this should be done for high-risk patients in particular, as most of these patients have multiple risk factors and stand to benefit the most from preventive therapy.[1-5] Previous studies have nevertheless shown the assessment of cardiovascular risk factors in high-risk patients in general practice to be less than optimal.[6,7]

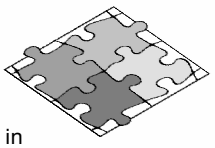
Specific strategies are needed to improve the structure and process of health care.[8] In the past, a variety of single interventions have been undertaken, such as the dissemination of guidelines, organisation of educational conferences, use of educational materials, and the holding of small-group meetings. Multifaceted interventions have, however, been found more effective than single interventions.[9,10] A combination of feedback with educational outreach visits has proven to improve cardiovascular disease (CVD) prevention in general practice in particular.[11-15] These positive results have been obtained in small-scale research trials, however. It remains unclear whether such interventions are successful in a nationwide project with a large number of practices. The management of a nationwide project is obviously complicated and most GPs may be less motivated to adopt new ideas than those who volunteer to participate in research trials.

The objective of the present paper was to evaluate the feasibility and effectiveness of a nationwide implementation project for CVD prevention. The results for specific aspects of both the structure and process of preventive care, the costs, and the barriers to change will be considered. Finally, the barriers to further implementation will be discussed.

Background and setting

Dutch GPs and their professional organisations have progressively implemented a number of preventive activities during the past few years. In 1995, the National Association of General Practitioners (NAGP; the 'labour union') and the Dutch College of General Practitioners (DCGP; the scientific association) initiated a nationwide prevention programme. With the financial support of the government, cervical cancer screening and vaccination for influenza improved significantly.[16,17] In 1998, the NAGP and DCGP added a third topic to the programme: to improve the structure and process of the assessment of cardiovascular risk factors in patients at high cardiovascular risk. Eight hundred practices (17% of all Dutch practices) participated at the start of this CVD prevention project.

HOW THIS FITS IN



What do we know?

Multifaceted interventions improve the quality of preventive cardiovascular care in general practice when applied in small-scale research trials.

What does this paper add?

A combination of conferences, dissemination of manuals, and support from outreach visitors can improve the structure, and to some extent the process, of preventive cardiovascular care when applied on a nationwide scale. Such observations do not guarantee nationwide application, however, and income policy and the workload of the care providers can block the actual adoption of evidence-based medicine.

Method

Study design and participants

We conducted a controlled before-and-after trial to assess the feasibility and effectiveness of a multifaceted intervention when applied on a nationwide scale. A group of practices receiving the intervention was compared to a group of practices receiving no special attention. The trial groups were recruited by inviting a random sample of 420 practices from the 800 practices participating in the project for further study, and by inviting 600 practices from the other 4000 practices in The Netherlands. The sampling was stratified by type of practice; that is, single-handed versus group, and practice location; that is, >50 000 inhabitants or not.

The 800 practices receiving the multifaceted intervention were recruited between January 1998 and August 1998 and equally distributed across the 23 districts for general practice. All Dutch practices were invited via regional GP bulletins to participate in the project and each district included practices until approximately 15% of the practices in that district were recruited. The inclusion criteria were the use of a clinical computer system and employment of one or more practice assistants. While a vast majority of the Dutch practices have computers and practice assistants, we considered these criteria crucial for the conduct of the project. In The Netherlands, practice assistants are qualified to perform administrative and organisational tasks (including the triage of patients) as well as medical activities such as blood pressure measurement and the provision of lifestyle advice. Practices received a recompense of £300 (450 Euro) per standard practice per calendar year (with a standard practice in The Netherlands containing 2350 patients) for participation in the intervention.

Intervention

The practices in the intervention group received multifaceted support to implement a stepwise protocol. The content of the protocol was derived from the well-accepted recommendations from national and international guidelines[3,18,19] and is presented in Figure 1. The stepwise design was intended to provide firm guidance for the practices and minimise any obstacles with regard to workload. The protocol was focused on improvement of the assessment and recording of cardiovascular risk factors in high-risk patients, and use of the Dutch minimal contact intervention (MCI) for smoking cessation[20]; the further promotion of the prescription of preventive drugs and the provision of lifestyle advice was considered beyond the scope of the present project. The multifaceted support comprised educational conferences for the GPs and practice assistants, dissemination of a manual, and four outreach visits per practice. Details of the support are presented in Box 1. The intervention period lasted from September 1998 to September 2000.

The facilitators who conducted the outreach visits were specially trained to implement the project protocol. Their training involved 10 half-day workshops during the course of the project. Regional meetings for the facilitators from different district offices and the national staff were also organised about five times a year, and a national newsletter for all of the facilitators was distributed on a bi-monthly basis. Most of the facilitators had experience with the implementation of prevention activities in general practice from previous projects. Most of the facilitators had also worked as a practice assistant in the past but none of them were trained physicians.

Outcome measures

The key measures for improvement were the compliance rates for indicators related to the structure and process of preventive cardiovascular care. We used eight indicators related to the structure of care; six indicators related to the process of assessing modifiable risk factors; and one indicator related to the application of the MCI for smoking cessation (Table 2). We assumed that improvement of the structure of preventive cardiovascular care would also promote the process of care. The process indicators were derived from the evidence-based project protocol.

Assessments

We used postal questionnaires to gather both baseline information (October 1998) and post-intervention information (September 2000). Reminders were sent to non-responders after 2 and 4 weeks. Those practices that responded at baseline but not after the post-intervention reminders were sent shortened versions of the questionnaire. The information was provided by one GP per practice and the same GP for both measurement points.

The questionnaires assessed elements of the structure and process of preventive care. The GPs were asked whether they used specific reminders, specific computer files, written protocols, and/or separate clinics for the assessment of cardiovascular risk-factor profiles and the detection of hypertension. The GPs were also asked whether they assessed specific modifiable risk factors in patients with diabetes mellitus, hypertension, hypercholesterolaemia, a history of CVD, or parents/siblings with coronary heart disease before the age of 60 years. Furthermore, the GPs were asked to indicate the extent to which they measured blood pressure in 60-year-old patients who visited the practice and had no previous blood pressure measurement during the last year (i.e., all, most, some, or no patients). Finally, the GPs were asked whether the MCI for

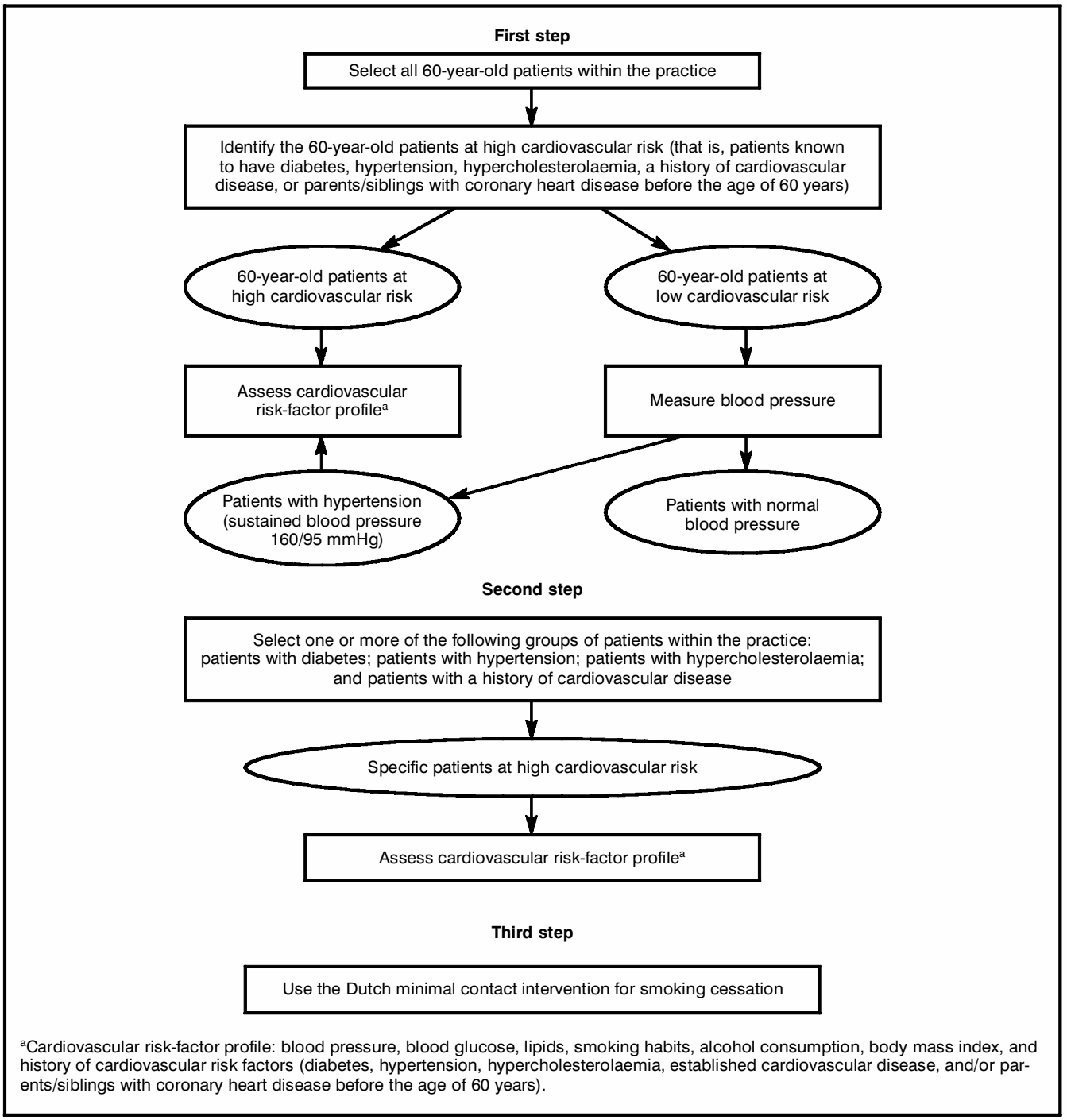


Figure 1. Project protocol

smoking cessation was used in their practices.

We also collected information on the costs of the intervention, the time spent by the GPs and practice assistants to implement and execute the project protocol, and a number of practice characteristics and potential barriers to change. The accounts of the NAGP provided information about the costs of the nationwide prevention programme and also the recompense for the practices that received the intervention on CVD prevention. The national prevention staff advised to estimate the salary costs and also the other expenses for the 3-year project on CVD prevention at 50% of those for the entire prevention programme. We used the results of a separate study of the project to estimate the amount of time spent by the GPs and practice assistants.[21] Baseline information on the type of practice and practice location was obtained from the Netherlands Institute for Health Services Research. Furthermore, the baseline questionnaires included items pertaining to the degree (always/mostly versus sometimes/never) to which the GPs delegated clinical tasks to their practice assistants

- one or two conferences per district *(months 1–3)*
- dissemination of the project manual *(months 1–3)*
- support from trained facilitators during four outreach visits per practice
  - first visit *(months 4–6)*: advice on the selection of specific groups of 60-year-old patients
  - second visit *(months 5–11)*: advice on the assessment and recording of cardiovascular risk factors
  - third visit *(months 12–19)*: advice on the selection of specific groups of patients at high cardiovascular risk
  - fourth visit *(months 20–24)*: advice on the use of the minimal contact intervention for smoking cessation
- telephone calls from the facilitators to the practice teams between the different visits
- letters to the practice teams about the preliminary results and progress of the project
- recompense of £300 (450 Euro) per standard practice per year

Box 1. A 2-year intervention among 800 practices to improve the assessment and recording of cardiovascular risk factors. (For additional data, see Supplementary Box 1.)

(expressed by a validated 'delegation index', including five clinical tasks: venepuncture, removing stitches, removing earwax, checking patients with hypertension, and freezing warts).[22] The post-intervention questionnaires included items pertaining to the extent to which certain factors (Table 4) acted as barriers to change. This set of potential barriers to change was derived from in-depth interviews with 19 practice teams that received the intervention.[21]

Statistical analysis

We used multivariate logistic regression analyses to estimate the effect size of the intervention. For each indicator, the quality of care was treated as a binary dependent variable: either the practices complied with the indicator or not. The independent variables in each model were allocation to the intervention versus control group and compliance versus no compliance with the dependent variable at baseline.

Results

A total of 316 GPs participating in the project (84.0%) and 301 non-participants (77.2%) responded both at baseline and post-intervention and thus formed the intervention group and control group, respectively (Figure 2). Thirty seven of the GPs in the intervention group (11.7%) and 74 of the GPs in the control group (24.6%) returned the shortened version of the post-intervention questionnaires. Both the intervention and control group constituted a representative sample of all Dutch practices with regard to type of practice and practice location (Table 1). However, the intervention group showed higher scores for task delegation to the practice assistants when compared to the control group (65% versus 49%, $P<0.001$, χ^2 test). At baseline, the control group showed lower scores for the structure of preventive cardiovascular care when compared to the intervention group, but in general relatively higher scores for the process of care (Table 2). During the course of the trial, both the intervention and control group improved statistically significantly with regard to the use of specific computer files and also the completeness of the risk-factor profiles that the GPs assessed in high-risk patients (with the exception of the patients with diabetes). The intervention group also improved for all of the other indicators (Table 2).

Outcome measures

The intervention group improved in 10 of the 15 indicators when compared to the control group. A positive effect was found on all eight of the structure-of-care indicators, on the extent to which the GPs measured blood pressure in 60-year-old patients, and on the use of the MCI for smoking cessation. No effect was found on the completeness of the risk-factor profiles that the GPs assessed in specific groups of high-risk patients (Table 3).

Barriers to change

The percentage of the GPs experiencing a barrier to change ('much' or 'very much') varied from 2% to 26% (Table 4). Time constraints on the GP, time constraints on the practice assistant(s), and insufficient financial recompense were viewed as particular barriers to change. The quality of the intervention (i.e., the conferences, the manual, the facilitator)

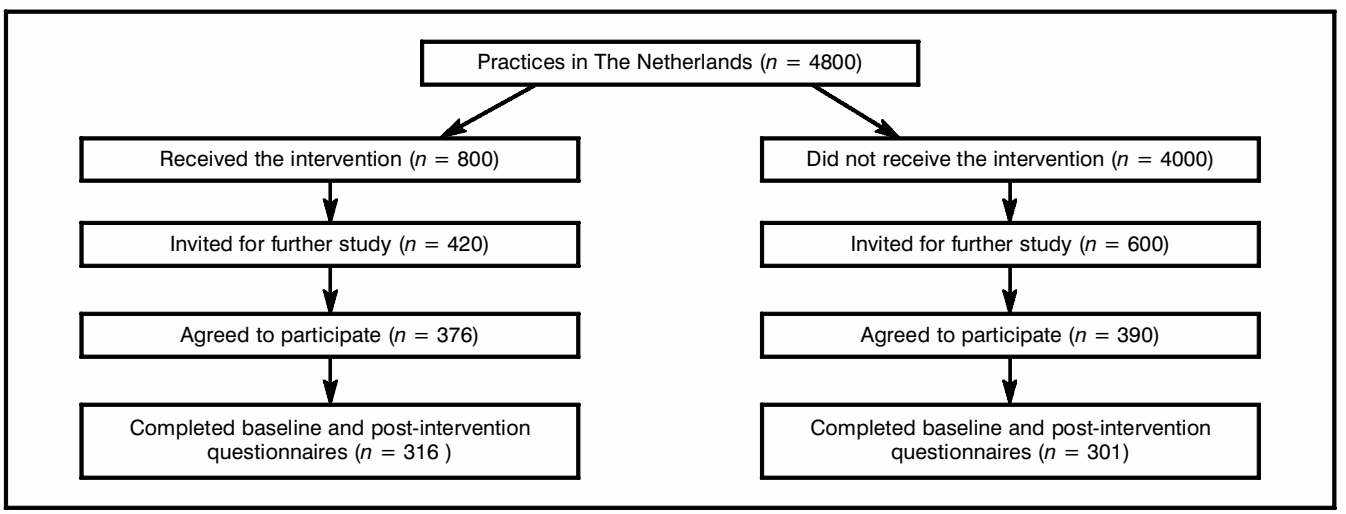


Figure 2. Trial profile.

Table 1. Baseline characteristics of the practices in the trial groups versus all Dutch practices.

Practice characteristic	Intervention group (%) (n = 316)	Control group (%) (n = 301)	All Dutch practices (%) (n = 4800)
Single-handed	68	70	67
Urban location[a]	41	39	41
High delegation-index[b]	65	49[c]	not available

[a]>50 000 inhabitants; [b]Three to five specific clinical tasks were always/mostly delegated to the practice assistants; [c]$P<0.001$ when compared to the intervention group, χ^2 test.

was rarely viewed as a relevant barrier.

Costs and time

The 3-year project for preparing and executing the intervention among 800 practices cost £3 000 000 (4 750 000 Euro) or £3750 (6000 Euro) per practice. These costs included the salaries of the staff at the district and national levels (£1 700 000); expenses for premises, travel, and other issues (£500 000); and recompense for the participating practices to implement the protocol (£800 000). These costs did not include the extra time spent by the practice teams to actually assess and manage the various cardiovascular risk factors. In a separate study (n = 80 practices receiving the intervention), the GPs and practice assistants were found to spend an average of 15 hours per person to implement and execute the project protocol during the 2-year intervention. These hours included the time for an average of 3.6 (95% confidence interval = 3.1 to 4.1) outreach visits per practice.[21]

Discussion

A multifaceted intervention involving 800 general practices appeared to improve the quality of certain aspects of preventive cardiovascular care. At baseline, the performance of the GPs was generally found to not be very adequate, and thus stresses the need for improvement. A positive effect of the intervention was then found on the structure of the assessment of cardiovascular risk factors, on the extent to which the GPs measured blood pressure in 60-year-old patients, and on the use of the Dutch MCI for smoking cessation. There was no effect with regard to the completeness of the risk-factor profiles in any group of patients at high risk. The control group showed improvement on six of the 15 indicators. These changes in the control group can be attributed to discussions and publications relating to the present project, the publication of the revised national guidelines for cardiovascular and diabetes care during the course of the study, and the so-called Hawthorne effect. After the intervention, ample room for further improvement still existed. Some 25% of the GPs reported time constraints as a barrier to change and some 25% mentioned insufficient financial recompense as a barrier to change.

Comparison of the effects and costs of the present nationwide intervention with those of small-scale interventions is hindered by differences in the outcome measures and economic evaluation. Nevertheless, a small-scale, randomised controlled trial (n = 124 Dutch practices) on all aspects of preventive cardiovascular care showed an increase of 14–31% in the scores for the structure of care and 0–19% in those for the process of care. The multifaceted intervention comprised feedback reports and support from facilitators during 15 outreach visits per practice across a period of 21 months.[13-15] In the present nationwide intervention, the effects on the process of care were small also. The small-scale intervention cost £2700 (4300 Euro) per practice and thus appeared less expensive than the present nationwide intervention that cost £3750 (6000 Euro) per practice. The difference is partly due to the salary costs and other expenses of the national staff for preparing and managing the nationwide project. Both studies indicate that multifaceted interventions are expensive while the effects are small to moderate. However, single interventions — that may be less expensive — are seldom effective[8] and, thus, mostly a waste of time and money.

Limitations

The present study has some limitations. Certain effects may have been overestimated as the groups were not randomised.[23] In fact, the trial groups differed at baseline with the intervention group showing relatively greater task delegation and a higher quality of care structure that may have facilitated greater change in turn. Also, the intervention practices volunteered to participate and may have been more motivated to change than other practices. Furthermore, the use of self-administered questionnaires may have biased the results and increased the observed effects on the process of care in particular.[24] Nevertheless, most of the statistically significant differences between the trial groups involved pronounced changes and appeared to be caused — at least in part — by the intervention. Finally, we did not evaluate patient outcomes and the outcomes measured here are only first steps in adequate cardiovascular risk management. The next steps — drug therapy and lifestyle advice in particular — need to be optimal also.

Ongoing developments

In September 2000, the funding committee of the Ministry of Health and also the NAGP assembly considered the continuation of the project on CVD prevention. The funding committee aimed to provide further funds to include more practices and also more objectives; such as, improvement of preventive drug therapy, in the project. The NAGP assembly, however, decided to put a stop to all of the activities in January 2001. The assembly also decided that the project should not be continued for those GPs willing to participate on a voluntary basis. These decisions were made within the context of discussions about the heavy workloads and insufficient incomes being experienced by GPs in The Netherlands. The NAGP urged the government to provide extra resources for increased general practice staff and to raise the incomes of GPs. The issue of workload was not very prominent in 1998 when the project on CVD prevention

Table 2. Compliance with the content of the indicators at baseline and post-intervention measurement. Values are number of practices (%) unless stated otherwise.

Indicator	Subjects (*n*)	Compliance: Baseline (*n* [%])	Compliance: Post-intervention (*n* [%])	Difference: %	Difference: 95% CI
Structure of care					
Reminder (via computer or written note) for the assessment of cardiovascular risk-factor profiles in (certain) patients at high cardiovascular risk[a]					
Intervention	279	83 (29.7)	118 (42.3)	12.5	5.7 to 19.3
Control	227	42 (18.5)	50 (22.0)	3.5	-2.7 to 9.8
Reminder (via computer or written note) for blood pressure measurement in 60-year-old patients					
Intervention	272	33 (12.1)	140 (51.5)	39.3	32.3 to 46.3
Control	215	16 (7.4)	8 (3.7)	-3.7	-7.3 to -0.1
Record cardiovascular risk factors in a specific computer file					
Intervention	279	116 (41.6)	215 (77.1)	35.5	28.8 to 42.2
Control	227	69 (30.4)	99 (43.6)	13.2	6.0 to 20.4
Record blood pressure readings in a specific computer file					
Intervention	316	155 (49.1)	223 (70.6)	21.5	16.2 to 26.9
Control	301	111 (36.9)	131 (43.5)	6.6	1.6 to 11.6
Written protocol for the assessment of cardiovascular risk-factor profiles					
Intervention	259	15 (5.8)	82 (31.7)	25.9	20.2 to 31.6
Control	190	5 (2.6)	10 (5.3)	2.6	-1.1 to 6.4
Written protocol for the detection of hypertension					
Intervention	261	23 (8.8)	70 (26.8)	18.0	12.2 to 23.8
Control	193	4 (2.1)	8 (4.1)	2.1	-0.8 to 5.0
Separate clinics for the assessment of cardiovascular risk-factor profiles					
Intervention	272	23 (8.5)	86 (31.6)	23.2	17.4 to 28.9
Control	216	8 (3.7)	13 (6.0)	2.3	-1.0 to 5.6
Separate clinics for the detection of hypertension					
Intervention	268	32 (11.9)	93 (34.7)	22.8	16.6 to 28.9
Control	215	6 (2.8)	9 (4.2)	1.4	-2.2 to 4.9
Process of care					
Assessment of (almost) complete risk-factor profiles[b] in patients with:					
Diabetes					
Intervention	316	254 (80.4)	254 (80.4)	0.0	-5.9 to 5.9
Control	301	238 (79.1)	230 (76.4)	-2.7	-8.4 to 3.0
Hypertension					
Intervention	316	173 (54.7)	231 (73.1)	18.4	11.7 to 25.0
Control	301	176 (58.5)	223 (74.1)	15.6	9.5 to 21.7
Hypercholesterolaemia					
Intervention	316	183 (57.9)	223 (70.6)	12.7	6.0 to 19.3
Control	301	183 (60.8)	205 (68.1)	7.3	1.0 to 13.6
Cardiovascular disease					
Intervention	316	158 (50.0)	199 (63.0)	13.0	6.3 to 19.6
Control	301	168 (55.8)	198 (65.8)	10.0	3.3 to 16.6
Parents or siblings with coronary heart disease before the age of 60 years					
Intervention	316	119 (37.7)	155 (49.1)	11.4	4.7 to 18.1
Control	301	138 (45.8)	159 (52.8)	7.0	0.2 to 13.8
Measurement of blood pressure in all/most 60-year-old patients					
Intervention	300	103 (34.3)	209 (69.7)	35.3	28.7 to 42.0
Control	289	106 (36.7)	118 (40.8)	4.2	-1.5 to 9.8
Use of the Dutch minimal contact intervention for smoking cessation					
Intervention	308	84 (27.3)	114 (37.0)	9.7	3.2 to 16.3
Control	297	69 (23.2)	84 (28.3)	5.1	-0.6 to 10.7

[a]Patients known to have diabetes, hypertension, hypercholesterolaemia, established cardiovascular disease, or parents/siblings with coronary heart disease before the age of 60 years; [b]Assessment of at least four of the following risk factors: blood pressure, cholesterol, blood glucose, smoking habits, and body mass index.

Table 3. Effect size of the intervention[a].

Indicator	Odds ratio	95% CI
Structure of care		
Reminder (via computer or written note) for the assessment of cardiovascular risk-factor profiles in (certain) patients at high cardiovascular risk[b]	2.37	1.57 to 3.56
Reminder (via computer or written note) for blood pressure measurement in 60-year-old patients	27.13	12.86 to 57.24
Record cardiovascular risk factors in a specific computer file	4.27	2.86 to 6.38
Record blood pressure readings in a specific computer file	3.44	2.30 to 5.15
Written protocol for the assessment of cardiovascular risk-factor profiles	8.36	4.14 to 16.90
Written protocol for the detection of hypertension	7.62	3.54 to 16.38
Separate clinics for the assessment of cardiovascular risk-factor profiles	7.12	3.77 to 13.44
Separate clinics for the detection of hypertension	10.94	5.34 to 22.44
Process of care		
Assessment of (almost) complete risk-factor profiles[c] in patients with:		
Diabetes	1.26	0.85 to 1.86
Hypertension	0.99	0.69 to 1.44
Hypercholesterolaemia	1.18	0.82 to 1.68
Cardiovascular disease	0.94	0.67 to 1.32
Parents or siblings with coronary heart disease before the age of 60 years	0.93	0.67 to 1.30
Measurement of blood pressure in all/most 60-year-old patients	4.25	2.91 to 6.21
Use of the Dutch Minimal Contact Intervention for smoking cessation	1.45	1.02 to 2.07

[a]Multivariate logistic regression analysis with adjustment for baseline compliance; [b]Patients known to have diabetes, hypertension, hypercholesterolaemia, established cardiovascular disease, or parents/siblings with coronary heart disease before the age of 60 years; [c]Assessment of at least four of the following risk factors: blood pressure, cholesterol, blood glucose, smoking habits, and body mass index.

*Table 4. Opinions of the general practitioners (*n*=316) in the intervention group concerning barriers to change.*

Barrier	(Very) much	To some extent	(Almost) not at all (%)
Time constraints for the general practitioner	26	32	42
Time constraints for the practice assistant	26	30	44
Insufficient financial recompense	26	23	51
Change of practice assistants in the practice	13	8	79
Temporary absence of the practice assistant	11	8	81
Absence of separate consulting room for the practice assistant	10	10	80
Resistance to measurement of blood pressure in all 60-year-old patients	9	13	78
Insufficient skill on the part of the general practitioner to use the software package	8	11	81
Insufficient skill on the part of the practice assistant to use the software package	7	10	83
Unclear computer manual	6	11	83
Insufficient knowledge/skills on the part of the practice assistant	5	11	84
Poor quality of the informational conferences	5	8	87
Resistance to the assessment of risk-factor profiles in patients at high cardiovascular risk	4	9	87
Insufficient support from the facilitator	3	5	92
Unclear project manual	2	9	89
Resistance from patients	2	9	89
Change of general practitioners in the practice	2	4	94
Insufficient skill on the part of the facilitator	2	4	94

was initiated, whereas, in 2000 the assembly refused to intensify any of the existing GP tasks. The decision of the assembly was thus primarily strategic, but the members of the assembly also had their doubts about the effectiveness of blood pressure measurement in all 60-year-old people. The original recommendation from the DCGP guidelines to measure blood pressure in all patients 60 or more years old was based on consensus rather than evidence. Nevertheless, the majority of the Dutch experts on CVD prevention, and also the board of the DCGP, called for improved general practice management of patients at high cardiovascular risk.

Implications

In our opinion, future initiatives to improve CVD prevention in general practice should specifically address workload. A general practice study in the United Kingdom objectively showed the assessment of risk factors in all patients at high cardiovascular risk to substantially increase the workload for many GPs.[25] Priorities must be set, and extra resources and personnel will be needed. That is, assessment of cardiovascular risk factors can be done by nurses or practice assistants, but newly identified risk factors may call for extra effort on the part of the GPs themselves. And despite some positive effects of the present intervention and the positive impressions of the participating GPs, most of the GPs in The Netherlands will probably not adopt any new implementation activities for CVD prevention unless

their current workload is somehow reduced.

References

1. Campbell NC, Thain J, Deans HG, *et al*. Secondary prevention in coronary heart disease: baseline survey of provision in general practice. *BMJ* 1998; **316:** 1430-1434.
2. Fahey TP, Peters TJ. A general practice-based study examining the absolute risk of cardiovascular disease in treated hypertensive patients. *Br J Gen Pract* 1996; **46:** 655-659.
3. Wood D, De Backer G, Faergeman O, *et al*. Prevention of coronary heart disease in clinical practice. Summary of recommendations of the Second Joint Task Force of European and other Societies on Coronary Prevention. *J Hypertens* 1998; **16:** 1407-1414.
4. Collins R, Peto R, MacMahon S, *et al*. Blood pressure, stroke, and coronary heart disease. Part 2, short-term reductions in blood pressure: overview of randomised drug trials in their epidemiological context. *Lancet* 1990; **335:** 827-838.
5. Ross SD, Allen IE, Connelly JE, *et al*. Clinical outcomes in statin treatment trials, a meta-analysis. *Arch Intern Med* 1999; **159:** 1793-1802.
6. Khunti K, Baker R, Rumsey M, Lakhani M. Quality of care of patients with diabetes: collation of data from multi-practice audits of diabetes in primary care. *Fam Pract* 1999; **16:** 54-59.
7. Brady AJB, Oliver MA, Pittard JB. Secondary prevention in 24 431 patients with coronary heart disease: survey in primary care. *BMJ* 2001; **322:** 1463.
8. Bero LA, Grilli R, Grimshaw JM, *et al*. Closing the gap between research and practice: an overview of systematic reviews of interventions to promote the implementation of research findings. *BMJ* 1998; **317:** 465-468.
9. Hulscher MEJL, Wensing M, van der Weijden T, Grol R. Interventions to implement prevention in primary care (Cochrane review). In: *The Cochrane Library*, Issue 4, 2002. Oxford: Update Software.
10. Wensing M, van der Weijden T, Grol R. Implementing guidelines and innovations in general practice: which interventions are effective? *Br J Gen Pract* 1998; **48:** 991-997.
11. Hulscher MEJL, van Drenth BB, van der Wouden JC, *et al*. Changing preventive practice: a controlled trial on the effects of outreach visits to organise prevention of cardiovascular disease. *Qual Health Care* 1997; **6:** 19-24.
12. Feder G, Griffiths C, Highton C, *et al*. Do clinical guidelines introduced with practice based education improve care of asthmatic and diabetic patients? A randomised controlled trial in general practices in east London. *BMJ* 1995; **311:** 1473-1478.
13. Lobo CM, Frijling BD, Hulscher MEJL, *et al*. Improving quality of organizing cardiovascular preventive care in general practice by outreach visitors: a randomized controlled trial. *Prev Med* 2002; **35:** 422-429.
14. Frijling BD, Lobo CM, Hulscher MEJL, *et al*. Multifaceted support to improve clinical decision making in diabetes care: a randomized controlled trial in general practice. *Diab Med* 2002; **19:** 836-842.
15. Frijling BD, Lobo CM, Hulscher MEJL, *et al*. Intensive support to improve clinical decision making in cardiovascular care: a randomised controlled trial in general practice. *Qual Saf Health Care* 2003; **12:** 181-187.
16. Hermens RPMG, Tacken MAJB, Hulscher MEJL, *et al*. Attendance to cervical cancer screening in family practices in The Netherlands. *Prev Med* 2000; **30:** 35-42.
17. Hak E, Hermens RPMG, Hoes AW, *et al*. Effectiveness of a coordinated nationwide programme to improve influenza immunisation rates in The Netherlands. *Scand J Prim Health Care* 2000; **18:** 237-241.
18. Geijer RMM, Burgers JS, van der Laan JR, *et al*. *NHG-Standaarden voor de huisarts [Guidelines from the Dutch College of General Practitioners]*. Vol 1. Utrecht: Dutch College of General Practitioners, 1999.
19. Thomas S, Geijer RMM, van der Laan JR, Wiersma Tj. *NHG-Standaarden voor de huisarts [Guidelines from the Dutch College of General Practitioners]*. Vol 2. Utrecht: Dutch College of General Practitioners, 1996.
20. Pieterse ME, Seydel ER, de Vries H, *et al*. Effectiveness of a minimal contact smoking cessation program for Dutch general practitioners: a randomized controlled trial. *Prev Med* 2001; **32:** 182-190.
21. Van Leest LATM, Schattenberg G, Mulder J, *et al. De effecten van invoering van preventie van hart- en vaatziekten [Results of implementing cardiovascular disease prevention]*. Nijmegen: Centre for Quality of Care Research, 2001.
22. Nijland A, Groenier K, Meyboom-de Jong B, *et al*. Determinanten van het delegeren van (medisch-technische) taken aan de praktijkassistente [Determinants for delegating (medical-technical) tasks to the practice assistant]. *Huisarts Wet* 1991; **34:** 484-487.
23. Kunz R. Oxman AD. The unpredictability paradox: review of empirical comparisons of randomised and non-randomised clinical trials. *BMJ* 1998; **317:** 1185-1190.
24. Eccles M, Ford GA, Duggan S, Steen N. Are postal questionnaire surveys of reported activity valid? An exploration using general practitioner management of hypertension in older people. *Br J Gen Pract* 1999; **49:** 35-38.
25. Hippisley-Cox J, Pringle M. General practice workload implications of the national service framework for coronary heart disease: cross-sectional study. *BMJ* 2001; **323:** 269-270.

Acknowledgements

This project was supported by a grant of ZON (Health Care Research in The Netherlands). Thanks are due to Jan Mulder for performing the statistical analyses. We would also like to thank all of the GPs, practice assistants, facilitators, and national staff members who participated in this project.

Supplementary information

Additional information accompanies this paper at
http://www.rcgp.org.uk/rcgp/journal/supp/index.asp