Practice visits as a tool in quality improvement: mutual visits and feedback by peers compared with visits and feedback by non-physician observers

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Abstract

Objective—To evaluate and compare the effects of two programmes of assessment of practice management in a practice visit: mutual visits and feedback by peers compared with visits and feedback by non-physician observers.

Design—Prospective, randomised intervention study, with follow up after one year.

Setting—General practices in the Netherlands in 1993 and 1994.

Subjects—A total of 90 general practitioners (GPs) in 68 practices; follow up after one year comprised 81 GPs in 62 practices.

Main measures—Scores on indicators and dimensions of practice management in the visit instrument to assess practice management and organisation (a validated Dutch method to assess practice management in a practice visit). Change was defined as the difference in score between the first visit and the visit after one year on 208 indicators and on 33 dimensions of practice management.

Results—Data of 44 mutual visits by peers were compared with data of 46 visits by non-physician observers. After a year both programmes showed improvements on many aspects of practice management, but different aspects changed in each of the two programmes. After mutual practice visits, GPs scored significantly higher on content of the doctor's bag, on collaboration with colleagues, on collaboration with other care providers, and on accessibility of patient information than after a visit by a non-physician observer. The visits by non-physician observers resulted in a higher score on extent of use of records and on assessment on outcome and year report.

Conclusion—Change after mutual practice visits and feedback by peers is more marked than after a visit and feedback by a non-physician observer.

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Keywords: practice visit; outreach visit; practice management; educational assessment; peer review; audit

One of the most challenging questions in quality of care today is how to change the practice performance of care providers. Effective and feasible methods which improve performance and justify the investment of money and man-

power are urgently required.¹ Educational outreach visits in combination with other interventions proved to be effective, especially in the reduction of inappropriate prescribing²—hence their popularity with pharmaceutical companies—and have shown their potential for change. Some multifaceted interventions are effective in inducing change in general practice. Information linked to performance is not necessarily effective, although social influence and management support may help to improve its effectiveness.³ Assessment in a practice visit is a multifaceted intervention, in which one or more observers come to a practice to assess and discuss the quality of care or services preferably against guidelines and criteria. This may be a creative and stimulating way of assessing how well general practitioners (GPs) and practices measure up to their intended performance, pointing the way to how the practice can develop.⁴ However, the effectiveness of practice visits should be known both to GPs and policy makers because visits require manpower, money, and time.

Since Collings reported on the grim situation of English general practice in 1950 on the basis of a sample of 55 practices,^{5,6} practice visits have been acknowledged as a powerful means of achieving change, and a great possible asset in quality improvement. In a search in the *Cochrane Library* on the effectiveness of outreach visits, positive effects were observed in all 18 selected trials, which were mainly about prescription and diagnostic tests.² Steel proved that outreach visits were even more effective for the reduction in prescription than audit and feedback.⁷ These results, however, may not hold true for practice visits.

In several countries a practice visit is used in quality improvement as a tool to identify weak and strong points in the quality of care and to set priorities for change, as well as to value the practice standard of service and care. The methods for assessing general practices in a practice visit currently used in the UK,^{8,9} Canada,¹⁰ Australia,¹¹ New Zealand,¹² and Sweden¹³ differ in type of programme (for example in the qualifications and number of observers/assessors, in the length of the visit, or in the method of data collection), in content,^{9,14} and in objectives (educational *v* selective, for example becoming a fellow of the Royal College of General Practitioners in the UK or identifying GPs in need of extra training in Canada¹⁴ and Australia¹⁵). All except the Cana-

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dian College assume that a colleague should do the visit, assuming a peer is more effective.

In the Netherlands and Tasmania conducting a practice visit was assumed to be more effective than merely being visited and therefore educational programmes using mutual practice visits were tried, offering colleagues the opportunity to assess and to be assessed. The programmes were not evaluated, however.

Information feedback in general practice in the UK supported by visiting colleagues (clinical facilitators) was more effective than statistical feedback in producing behavioural changes at GP level^{16 17} (but not at practice level¹⁸). In his study on peer review in local GP groups, Grol found that after one year there were changes in history taking, patient education, involving patients in the consultation, follow up, and prescribing drugs.¹ However, the practice visits in his study were not evaluated. Peer review in local GP groups was evaluated as being up to three times more effective than other methods of quality improvement.¹⁹ Colleagues, Grol concluded, could be more knowledgeable, committed, supportive, constructive, and understanding—all qualities needed for awareness and change—however, they could also be opinionated and thoughtful in solutions, stereotypes, and truisms.¹⁹ On the other hand, feedback by non-physician observers could be less intrusive and better substantiated.²⁰ It may well be the programme of a visit rather than the content that determines its effectiveness. If we could find clues for establishing a better programme, it could boost the implementation of practice visits. This study sets out to compare the changes after two prevailing programmes: practice visits by peers compared with visits by non-physician observers. It will also answer what aspects of practice management changed after each programme. A separate article about the feasibility of both programmes is also published in this issue of *Quality in Health Care* (page 167).

Methods

STUDY DESIGN AND PARTICIPANTS

We invited 15 local GP groups—teams of GPs sharing responsibilities for care and continuity and participating in continuous medical education or audit—with a total of 109 Dutch GPs (box 1) to participate in a prospective randomised intervention study (table 1). Recruitment implied advertising in medical journals or during postgraduate courses and approaching key people in the profession and representatives of GP groups. The GP practices applied at intervals of one to four weeks. On application, the practices were randomly assigned to either programme: (a) a visit by a peer or (b) a visit by a non-physician observer. For practical reasons

- In total 7170 GPs (= 1 GP/2274 patients²⁹; men = 87%, women = 13%)
- Single handed GPs = 49%; dispensing GPs = 11%, GP trainers = 14%, group practice = 20% (10% salary paid)
- 60% of the patients are on a capitation fee; 40% are private patients (fee for service)
- The GP has a role as gatekeeper and refers only 6% of all patients that he sees to a specialist³⁰
- GP (locum) groups coordinate emergency care (24 hours/day, seven days/week), home care, cooperation, and quality improvement
- Practice assistant works partly as a receptionist and partly as a practice nurse

Box 1 The setting and management of Dutch general practice

we chose not to improve further matching for GP characteristics. Table 2 shows the characteristics of the GPs.

The GPs and their practices were visited with the same practice visit method (VIP: visit instrument to assess practice management and organisation, a Dutch instrument) using the same indicators but a different procedure.^{21 22} Two different procedures or programmes of practice visits were compared: “assessment in mutual practice visits by peers” (a colleague or peer does the visit, gives feedback, and in his turn is visited by another colleague of the GP group) versus “assessment in a practice visit by a non-physician observer” (experienced practice assistants, a role requiring two to three years of specific education in the Netherlands, who had three days of instruction in conducting a practice visit). GPs did not receive training except for the brief introduction and a written instruction. After a year all GPs were revisited by non-physician observers using the same VIP, but were given an adapted feedback report.

In both programmes the GPs met with their local GP group after all visits had been completed to discuss the results and to make plans for changes during a two hour meeting. All GPs were recommended to discuss the feedback report with the participants in their practice at a later date.

INSTRUMENTS AND VARIABLES

The practice visit method (VIP) consists of instruments for data collection (a questionnaire for the GP and one for the first practice assistant in rank, 30 questionnaires for patients, and a tally list for the observer), a programme for the visit, and a prestructured feedback report. Feedback in the report implied comparison of individual GP/practice

Table 1 Study design

Initial visit	Intervention	Follow up visit (after 1 year)
Practice visit by a peer, using the VIP	Feedback by a peer (1 hour), 2 hours of discussion in the GP group plus a practice visit to another colleague	Practice visit by a non-physician observer, using the VIP
Practice visit by a non-physician observer using the VIP	Feedback by a non-physician, trained observer (1 hour) plus 2 hours of discussion in the GP group	Practice visit by a non-physician observer, using the VIP

Table 2 Characteristics of the 90 GPs over both conditions after randomisation

Condition	Total no of participants	Mutual visit by a peer	Visit by a non-physician observer
Number of groups	14	7	7
Number of GPs	90	44	46
Sex (male)	71	32	39
Practice assistant qualified	62	27	35
Practice assistant has own treatment room	72	34	38
Health centre	16	7	9
Group practice	16	14	2
Twin practice	17	10	7
Single handed	41	13	28
Rural practice <30 000 people	50	32	18
Working full time	61	28	33
GP trainer	9	7	2
GP did vocational training	71	35	36
Member of the Dutch College of GP	65	33	32

Need to put a Q TO A in about rural practice - what is <30?

scores to a large representative sample of 110 GPs in 88 practices,^{21 22} and histograms to visualise the score. In a one hour meeting the GP discussed the feedback report either with a peer or with a non-physician observer.

For the measurement of change we used all 208 indicators included in the practice visit method. They were proportionally distributed over six different chapters of practice management; 187 of these 208 indicators fitted into 33 internally consistent dimensions of practice management.²²⁻²⁴ The number of indicators

forming a particular dimension or scale varied from three to 14 (table 3). The remaining 21 indicators may not have been related to other aspects, but were relevant in themselves.

Change in practice management was defined as the differences in score on the 208 indicators and on the 33 dimensions of practice management, measured during the first visit and during the visit after a year. The differences in change were analysed for each programme, mutual visits by peers and visits by non-physician observers. We did a linear multilevel variance analysis (proc mix SAS). Level 1 = the practice or GP, level 2 = GP group. We also mentioned the intraclass correlation in the table (table 3).

Results

Of the 15 GP groups of 109 GPs, 14 groups with 90 GPs in 68 practices entered the study (table 4); seven groups with 44 GPs were assigned to mutual visits by peers and seven groups with 46 GPs were allocated to visits by non-physician observers. The GPs in both conditions were comparable for sex, qualified practice assistant, own treatment room for the practice assistant, working full time, having completed vocational training, and being a member of the Dutch College of GPs.

Table 3 Change on aspects of practice management between two visits (1 year interval). Comparison of mutual visits by peers (n=41) and a visit by a non-physician observer (n=40)

Main chapters and dimensions in practice management (number of indicators in the chapter or dimension)	Level	(A) Mutual visits by peers (n=41) % change	(B) Visit by non-physician observer (n=40) % change	A-B† Difference % (95% CI)	Intraclass correlation (GP group)
P = practice level; GP = GP level					
Premises and equipment (45)					
Equipment in treatment/examination room and lab (14)	P	8	-1	11 (-2 to 24)	0.07
Hygiene (8)	P	13	-0.8	14 (-7 to 34)	0.07
Use by GP of equipment, diagnostics, and therapeutics (12)	GP	5	16	-9 (-22 to 4)	0.12
Content of the doctor's bag (11)	GP	27	-3	26 (9 to 43)**	0.08
Delegation and collaboration (57)					
Medical technical tasks delegated to assistant (9)	P	13	21	-3 (-20 to 13)	0.0
Laboratory tasks delegated to assistant (4)	P	3	4	2 (-19 to 22)	0.13
Informing patients on diseases by the assistant (3)	P	-8	7	-15 (-37 to 8)	0.0
Medical organisational tasks delegated to assistant (4)	P	16	3	9 (-13 to 32)	0.26
Secretarial tasks delegated to assistant (5)	P	16	9	9 (-16 to 34)	0.0
Collaboration with colleagues (GP group) (12)	P	16	-5	23 (4 to 42)*	0.28
Collaboration with partners in primary care (5)	P	-4	-3	1 (-31 to 34)	0.20
Collaboration with partners in secondary care/hospital (7)	P	4	4	6 (-20 to 32)	0.19
Collaboration with homes for the elderly and other care providers (8)	P	41	-8	43 (16 to 70)**	0.07
Service and organisation (30)					
Accessibility (patient Q, 6)	P	-2	-0.3	-2 (-6 to 3)	0.01
Organisation of surgeries/availability (patient Q, 5)	P	-4	-9	5 (-7 to 18)	0.0
Use of patient information on disease by GP (patient Q, 3)	GP	7	6	2 (-13 to 16)	0.08
Accessibility of patient information for GP or patient (7)	GP	22	-6	25 (3 to 47)*	0.04
Organisation of preventive activities (9)	P	6	9	-4 (-22 to 14)	0.0
Record keeping (20)					
Recording using the SOAP system (4)	GP	17	6	10 (-3 to 22)	0.26
Recording of prescriptions (4)	GP	26	12	5 (-29 to 40)	0.36
Basic data or list of problems/ illnesses (5)	GP	10	-5	13 (-4 to 30)	0.07
Extent of use of records by GP (3)	GP	-3	24	-24 (-46 to -3)*	0.0
Level of computerisation of administration (4)	P	22	25	0 (-32 to 32)	0.0
Organisation of quality improvement (9)					
Assessment on outcome and a year report (6)	P	-8	392‡	-133 (-212 to -54)**	0.0
Quality improvement (audit, reading, education; 2 hours/week) (3)	GP	2	-6	7 (-13 to 27)	0.0
Workload and job stress (18)					
Workload (- = less time, + = more) (13)					
Consultations (surgery, visits, telephone calls to patients; 35 hours/week)	GP	5	-0.3	8 (-7 to 23)	0.29
Indirect patient care (administration, duty; meetings; 14 hours/week)	GP	-1	-10	7 (-14 to 28)	0.20
Meetings (professional, administrative; 1 hour/week)	GP	-26	-18	-5 (-53 to 42)	0.0
Job stress (- = less; + = more) (5 scales)					
Job satisfaction (pleasure, interest, and commitment)	GP	-5	-6	-2 (-20 to 16)	0.07
The GP is satisfied with the available time	GP	8	3	5 (-14 to 4)	0.0
Costs v benefits of the job are favourable	GP	10	5	6 (-16 to 3)	0.0
GP experiences less workload	GP	-4	0.5	-4 (-2 to 9)	0.05
GP experiences inappropriate demands by patients	GP	-7	-4	-2 (-11 to 16)	0.01

Significance of the difference between both methods: *p≤.05; **p≤.01.

†Because the percentage of change is related to the average of each group and the difference between the group is related to the average of both groups, the calculated difference may deviate to some extent.

‡Change from an average of 0.3 to 1.2 on a scale of 6 indicators explains the high percentage.

Table 4 Participation and dropout of GPs

	GPs (no of GP groups)	Peer visits (no of GP groups)	Observer
GPs reflecting to the call for participation and entering the randomisation of GP groups to peer visits and visits by non-physician observer	109 (15)		
After randomisation (1 group of 9 GPs refused peer visits)	100 (14)		
Number of GPs that made an appointment for the visit*	92 (14)	45 (7)	47 (7)
Number of feedback reports entering the analysis†	90	44	46
Revisited after one year‡	81	41	40

*Dropout (n=8) for various reasons: rebuilding, too busy, close to retirement.

†Dropout (n=2) because the feedback report was unsuitable for analysis.

‡Dropout (n=9) because GP changed practice, was ill, retired, died, had no time, was not interested anymore.

However, significantly more single handed practices (28 *v* 13) were visited by non-physician observers (table 2). Paired data on practice management were available for 81 visits in 62 practices; nine visits—equally distributed over both programmes—were not repeated.

After a year both programmes showed improvements on many aspects of practice management, but different aspects changed in each of the two programmes (table 3). The improvement was more noticeable after mutual practice visits than after a visit by a non-physician observer. After mutual practice visits, GPs scored significantly higher on the content of the doctor's bag, on collaboration with colleagues, on collaboration with homes for the elderly/other care providers, and on accessibility of patient information for both GP or patient (95% confidence interval). The two aspects of record keeping—that is, using the SOAP (subjective, objective, analysis, plan) system and basic data or list of problems/illnesses—also changed more in mutual visits, but the results were not significant. The only two aspects that improved significantly more after a visit by a non-physician observer were the extent of use of records by GP and assessment on outcome/year report.

In each programme the top 10 indicators accounting for the biggest change in score were exemplary of actual change (table 5). There were no overlapping indicators in the top 10 of

each programme. Most changes were at practice level. Not all aspects and indicators in the VIP are equally relevant. Some of the top 10 indicators are minor items, such as a bucket for used instruments or the presence of a proctoscope, others imply clear organisational improvements, such as having a list of patients with diabetes, agreement on medication policy with homes for the elderly, or sending an agenda for the GP group meetings in advance.

Discussion

This is probably the first study comparing the effectiveness of different programmes for practice visits in general practice: an outreach visit with an intervention (a peer visit) compared with an outreach visit alone. The Cochrane study on outreach visits specifically points out that such a study is as yet missing.² Our results indicate that assessment in a practice visit has the potential to become a powerful tool in quality improvement. The practice visit method (VIP) resulted in actual change on many aspects, the change being significantly more marked after mutual practice visits by peers. Change after mutual visits was more marked for aspects that had been studied or observed in detail by the visiting peer, such as the content of the doctor's bag and aspects of record keeping. Visiting a colleague in another practice was likely to be the biggest help for the

Table 5 Top 10 aspects of practice management, for which GPs changed most before and after one year; top 10 of mutual visits by peers (n=41) and of GPs visited by non-physician observers (n=40)

Mutual visits by peers (n=41)		Number of GPs changed (no now complying)	
1	Acquaintance with arrangements for temporary patient care requiring community support	P	14 (38)
2	Arrangement with cardiologists for a request on electrocardiogram diagnosis without referral	P	11 (26)
3	Presence of an arrangement in case of sick leave of GP	P	11 (34)
4	Presence of caustics for treatment of recurrent epistaxis	P	11 (32)
5	Presence in the surgery of a leaflet on acne	GP	11 (30)
6	Agreement with the homes for the elderly on when to call a GP in emergencies	P	10 (23)
7	Agreement on the division of tasks between GPs and ambulance service	P	9 (23)
8	Presence of a proctoscope in the treatment room	P	9 (26)
9	Presence in examination room of a bucket filled with water and antiseptic for used equipment	GP	9 (36)
10	The agenda is sent in advance to all members of the GP group	P	8 (18)
Visits by non-physician observer (n=40)			
1	Audit on outcome of prescriptions	P	17 (21)
2	GP applies a pressure gradient bandage for venous ulcer	GP	9 (27)
3	Audit on data provided by the health insurance funds	P	8 (11)
4	Practice assistant applies a pressure gradient bandage for venous leg ulcer	P	8 (14)
5	Practice assistant does the examination and follow up of cardiovascular patients	P	8 (18)
6	Practice assistant provides information to patients with diabetes, asthma/chronic obstructive pulmonary disease, cardiovascular risk	P	7 (24)
7	A leaflet with practice information is available for the patient	P	7 (36)
8	Presence of a survey list of patients with diabetes	P	7 (29)
9	The agenda is posted in advance to all members of the GP group	P	7 (37)
10	The presence in the doctor's bag of sticks to measure blood glucose	GP	6 (34)

P = practice level; GP = GP level.

improvement of one's own practice management rather than getting the feedback of a colleague.

However, the background of the observer was to some extent relevant to the changes that occurred. We have already mentioned the changes in collaboration seen after peer visits. After the visit and feedback by a non-physician observer—a practice assistant by profession—more change occurred in delegated medical technical tasks (not significant) and extent of use of records by GPs. The considerable change on assessment on outcome and year report is misleading because the group made a start near zero to 1.2 (the average in the other group).

After a year all GPs improved on two aspects of workload and on four (out of five) aspects of job stress. This improvement is relevant because the increasing workload of GPs (55 hours/week) in the Netherlands has made improvement of workload and job stress the top priority for the professional organisations. More proactive time management by GPs after the visit may explain the lower rating of organisation of surgeries and availability by the patient.

The two lists of the top 10 indicators for each programme give a good example of the concrete changes in practice management. Also, there is no overlap in the indicators that changed most.

The conclusions need to be interpreted with some caution. A control group without intervention was not included because it would still require data collection in a practice visit. Also, some indicators and aspects may just have changed over time. The level of computerisation of medical records is an aspect that changed equally in both programmes, probably due to the fast developments in this field. This may also hold true for delegated medical technical tasks. Computerisation may account for some of the change in the score on recording, using the SOAP system, prescriptions, and basic data or list of problems/illnesses. We may have to attribute change to the two hour discussion of the feedback in the GP group rather than to the feedback after the visit, but this could not be evaluated. A possible source of bias may have been the dropout of nine, mostly older, GPs, but the dropout was mainly caused by reasons not related to the study. The long term effect has not been studied, but may be less evident because changes on motivational aspects (such as keeping up the content) tend to diminish over time. Finally, one has to realise that it is unclear how these changes in structural aspects of care effect the quality of care. The relation with more clear endpoints (referral rates, prescription) deserves further study. A first step to study such a relation was made in a study on the association between scores on practice management using VIP and consulting skills of GPs.²⁵

Our findings are consistent with published work on strategies for change. In a study of hundreds of doctors (including GPs) divided over different sites in health care, Payne showed that non-coercive methods involving

care providers in problem identification, problem solving, and implementing solutions were effective.²⁶ Different interventions involving data collection on performance and seminars with active participation were compared with change of management and with no intervention. The more intense the intervention the greater the change is on a physician performance index. Multifaceted interventions are more effective than single interventions.³ Already in earlier studies, feedback to GPs of objective data on clinical competence and performance proved to be more effective than continuing medical education. A combination of information transfer and learning through social influence or through a management supported strategy—feedback and peer review in the VIP—is effective in most situations.^{3 27} When we apply these findings to our study, it may be said that a visit with only feedback from a non-physician observer may be considered a single or less multifaceted intervention resulting in less change when compared with the multifaceted intervention that included a visit to a peer. The greater effectiveness of mutual visits by peers has to be balanced against the efforts required. The feasibility aspects will be addressed in the second article.

There may be no magic bullets for change,²⁸ but interventions, based on a valid and reliable method of listing problems followed by a programme of problem solving, planning, and implementing change, are promising.

- 1 Grol R. Quality improvement by peer review in primary care: a practical guide. *Quality in Health Care* 1994;3:147–52.
- 2 Thomson MA, Oxman AD, Davis DA, *et al.* Outreach visits to improve health professional practice and health care outcomes. *Cochrane Library*. 1997: issue 4.
- 3 Wensing M, Van der Weijden T, Grol R. Implementing guidelines and innovations in primary care: which interventions are effective? *Br J Gen Pract* 1998;48:991–7.
- 4 Marinker M. *Medical audit and general practice*. London: BMJ Books, 1990.
- 5 Collings JS. General practice in England today: a reconnaissance. *Lancet* 1950;i:555–85.
- 6 Petchey R. Collings report on general practice in England in 1950: unrecognised, pioneering, piece of British social research? *BMJ* 1995;311:40–2.
- 7 Steel MA, Bess DT, Franse VL, *et al.* Cost effectiveness of two interventions for reducing outpatient prescribing costs. *Drug Intell Clin Pharm* 1989;23:497–500.
- 8 Royal College of General Practitioners. *Guide and criteria for fellowship by assessment*. Occasional paper 50. London: RCGP, 1990.
- 9 Royal College of General Practitioners. *What sort of doctor? Assessing quality of care in general practice*. London: RCGP, 1985.
- 10 College of Family Physicians of Canada. *Practice assessment program*. Montreal: CFPC, 1990.
- 11 Royal Australian College of General Practitioners. *Entry standards for general practices*. Sydney: RACGP, 1996.
- 12 Royal New Zealand College of General Practitioners. *Quality in family practice training program*. Wellington: RNZCGP, 1988.
- 13 Eliasson G, Berg L, Carlsson P, *et al.* Facilitating quality improvement in primary health care by practice visiting. *Quality in Health Care* 1998;7:48–54.
- 14 Berwick DM. Continuous improvement as an ideal in health care. *N Engl J Med* 1989;320:53–6.
- 15 Hull R. Audit of general practice in Australia. *Medical Audit News* 1995;5:92.
- 16 Mugford M, Banfield P, O'Hanlon M. Effects of feedback of information on clinical practice: a review. *BMJ* 1991;303:398–402.
- 17 Horder J, Bosanquet N, Stocking B. Ways of influencing the behaviour of general practitioners. *J R Coll Gen Pract* 1986;36:517–21.
- 18 Szczepura A, Wilmot J, Davies C, *et al.* Effectiveness and cost of different strategies for information feedback in general practice. *Br J Gen Pract* 1994;44:19–24.
- 19 Grol R. *Kwaliteitsbewaking in de huisartsgeneeskunde. Effecten van onderlinge toetsing*. [Quality control in general practice. Effects of peer group review.] Thesis. Nijmegen/Meppel: Krips Repro, 1987.

- 20 Essex B, Bate J. Audit in general practice by a receptionist: a feasibility study. *BMJ* 1991;302:573-6.
- 21 Van den Hombergh P, Grol R, Smits AJN, et al. Visitatie van huisartspraktijken; naar toetsing van de praktijkvoering. [A practice visit to assess the organisation of the general practitioner.] *Huisarts Wet* 1995;38:169-74.
- 22 Van den Hombergh P, Grol R, Van den Hoogen HJM, et al. Assessment of management in general practice: validation of a practice visit method. *Br J Gen Pract* 1998;48:1743-50.
- 23 Groenewegen PP, Hutten JBF. Workload and job satisfaction among general practitioners: A review of literature. *Soc Sci Med* 1991;32:1111-19.
- 24 Van Dierendonck D, Groenewegen PP, Sixma Opgebrand H. Een inventariserend onderzoek naar gevoelens van motivatie en demotivatie bij huisartsen. [Burnout. A study of feelings of motivation and demotivation of GPs.] Utrecht: NIVEL, 1992.
- 25 Ram P, Grol R, Van den Hombergh P, et al. Structure and process: the relationship between practice management and actual clinical performance in general practice. *Fam Pract* 1998;15:354-62.
- 26 Payne BC, Lyons TF, Neuhaus E, et al. Method of evaluating and improving ambulatory medical care. *Health Serv Res* 1984;19:218-45.
- 27 Wensing M, Grol R. Single and combined strategies for implementing changes in primary care: a literature review. *Int J Qual Health Care* 1994;6:115-32.
- 28 Scrivens E. Policy issues in accreditation. Editorial. *Int J Qual Health Care* 1998;10:1-5.
- 29 Harmsen J, Hingstman L. *Cijfers uit de registratie van huisartsen, Peiling 1996*. [Data from time registration of GPs.] Utrecht: NIVEL, 1996.
- 30 Boerma WGW, De Jong FAJM, Mulder PH. *Health care and general practice across Europe*. Utrecht: NIVEL, 1993.

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