

Practice Facilitators: A Review of The Literature

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Background: Practice facilitators (PFs) are health care professionals who assist primary care clinicians in research and quality improvement projects. Although they have been used in Europe and Australia for more than 20 years, the concept is relatively new in the United States. The recent evolution of primary care practice-based research networks (PBRNs) has led to greater awareness and expansion of this concept. **Objectives:** This study's objective was to review the literature on PFs and describe their origin, training, funding, roles, methods they use, and their impact on patient care outcomes in primary care. **Methods:** We searched four electronic databases from 1966 through the present, reviewing all articles pertaining to PFs in an effort to understand the history, training, financing, roles, methods, and impact of PFs. **Results:** Since the early 1980s, PFs have worked with individual practices on relationship building, education, and quality improvement (QI), particularly in the area of prevention. A number of publications provide information on the roles of PFs in primary care and methods they use to enhance practices. Many prospective, uncontrolled studies and a few randomized, controlled trials have documented the effectiveness of PFs but usually in combination with other interventions. A number of primary care PBRNs in the United States have begun to use PFs as a way to bridge the gap between research and practice. Limited information has been published about the training and funding of PFs. **Conclusions:** The PF concept seems to be a useful practice enhancement approach in primary care.

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Advances in medicine, technology, and health care management have resulted in an increase in the complexity of primary care. Physicians, nurses, nurse practitioners, physician assistants, and clinic staff must work together as well-organized teams, often under challenging conditions, to meet the ever-increasing expectations of patients, peer providers, third-party payers, business partners, and state and national health care authorities. Confronted with these challenges, clinicians have recognized the advantage of new resources for sustaining continuous quality improvement.

Practice facilitators (PFs) are one such resource available to primary care practices in several countries. PFs are health care professionals who assist primary care clinicians in research and quality improvement projects.¹ Another resource is the increasing number of primary care practice-based research networks (PBRNs). PBRNs bring together clinicians, research-

ers, PFs, and a variety of other partners (eg, quality improvement organizations, health departments, insurance carriers, etc) to discover and develop better ways to handle the many challenges of practice.² In this context, PFs can effectively assist clinicians and their staff to implement changes suggested by research or existing guidelines, help the office staff use information technology, and facilitate research and quality improvement projects.

This article's purpose is to review the literature on PFs. We will describe their roles in practice enhancement projects and their influence on patient care outcomes.

Methods

Publication Search Strategy

We performed a systematic literature review to answer the questions shown in Table 1. We searched the English-language literature based on systematic MEDLINE (PubMed), OVID, AMED, and EBM Reviews queries for the keyword "facilitator," in combination with the next keywords: "primary care,"

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“family medicine,” “general practice,” “family physician,” “practice-based research,” “audit,” “prevention,” “quality improvement,” “practice enhancement,” and “evidence based” between 1966 and 2004. Our primary search yielded 217 individual abstracts that included combinations of these keywords. If an abstract was not available, we obtained the full-text article.

One of us reviewed the abstracts and full-text articles and eliminated those that were not relevant to our review. We also reviewed the references in these publications and consulted experts to identify additional articles that might provide information about PFs. If published information was inadequate, we researched the topic via personal communication with authors.

Subsequently, all three authors reviewed the remaining 78 articles and determined the final list of papers by consensus, applying the following inclusion criteria: First, the publication had to characterize PFs as individuals working with primary care practices in research or quality improvement activities. Second, the work of the facilitator described in the report went beyond data collection and feedback or providing only information and included interaction with the practice(s) over a sustained period of time (generally more than 1 month). Third, the article was not a commentary or letter to the editor. A total of 47 articles met the inclusion criteria. These publications were then analyzed by the authors to answer the review questions.

Due to the limited number of publications on the role of PFs in the United States, we also surveyed members of the Agency for Healthcare Research and Quality PBRN and Federation of PBRNs e-mail lists (listserves). We received information from 11 PBRNs that reported use or plans for utilization of PFs in various capacities.

Results

Origin of the Practice Facilitator Concept

The PF concept can be traced back to the Oxford Prevention of Heart Attack and Stroke Project (Oxford Project) in England (1982–1984).³ The project examined the effect of providing practical help to general practitioners via facilitators on screening for cardiovascular disease. Encouraged by the success of Dr Arnold Elliott, the first peer physician facilitator in Islington, England,⁴ investigators used primary care facilitators to assist in the Oxford Project. The earliest reports that demonstrated the characteristics of the facilitator were published by Fullard et al.^{3,5} Fullard was the first primary care facilitator used by The Oxford Centre for Primary Care Prevention “for the purpose of promoting prevention in primary health care” and to “bridge the gap, or establish a new channel of communication between the general practitioner and his coworkers.”⁶ This report characterized the facilitator as a health care professional who helps the primary care team assess the current state of the practice and then plan, implement,

Table 1

Review Questions

- When, where, and why was the PF model developed?
- How is the work of PFs financed?
- How are PFs trained, and what is their background?
- What are the roles of PFs as described in the literature?
- What methods do PFs use to facilitate practice improvements?
- What impact have PFs had on primary care practices and patient care outcomes?
- How are PFs being used in practice-based research networks in the United States?

PF—practice facilitator

and evaluate the effectiveness of office system interventions that enhance prevention. The office system intervention typically includes chart audits and feedback, nurse training, identifying high-risk patients, printing risk cards, patient reminders and education materials, establishing recall systems, and “cross-pollination” of good ideas and information. In a later publication, Cook summed up the characteristics of the facilitator: “an agent of change, coordinator, a cross-pollinator of good ideas, a resource-provider, an information-giver, a trainer, researcher, adviser, and mentor.”¹ The PF concept has subsequently been implemented in other countries, notably in Australia,^{7,8} Canada,^{9,10} The Netherlands,^{11,12} and the United States.¹³

Our review of the literature yielded a number of versions of the facilitator’s title, including “facilitator,”¹ “clinical facilitator,”^{14,15} “prevention facilitator,”¹⁰ “audit facilitator,”¹⁶ “educational facilitator,”¹⁷ “project facilitator,”^{13,17} “nurse facilitator,”⁸ “primary care facilitator,”¹ and “practice enhancement assistant.”²²

Financing the Work of Practice Facilitators

We found limited information on financing the work of PFs. When funding was mentioned, it always related to the specific project discussed in the publication, but little or no information was provided on the sustainability of PF work across and between projects.^{8,11,12} PFs were generally hired by an academic medical center (The Netherlands, Canada, and the United States)^{11,13} or a health care authority, such as the Family Health Services Authority (FHSA, England),^{18,19} or Regional Health Authority (RHA, New Zealand)⁸ for a particular project. Generally, funding for individual projects was provided from government sources (England) or academic research grants (The Netherlands, Canada, Australia, and the United States).^{8,10}

Background and Training of Practice Facilitators

The most detailed description of facilitator training is provided by Carroll et al.²⁰ Based on the Oxford

Facilitator Model, the National Facilitator Development Project (NFDP) has trained hundreds of facilitators in England. Their training included methods of communication and collaboration, the audit cycle and its application in general practice, standard setting with practice teams, principles of data collection and analysis, managing change, and encouraging teamwork. The PFs who were hired usually had previous health care training, such as work as practice assistants,^{11,12} health visitors,²¹ or masters of community nursing.²² Although some additional information is available on the Internet, these Web sites generally do not detail the organizational aspects of PF employment.

Roles of Practice Facilitators

Facilitators assist clinicians with a variety of activities, including enhancement of documentation and delivery of clinical interventions, particularly preventive services; improvement of office systems (CQI); and implementation of Health Information Technology (HIT). A number of publications indicate that one of the most important functions of the facilitator is to promote prevention in primary care.^{6,17,23} This applies to classic preventive care (primary and secondary prevention) and to preventive services associated with management of chronic diseases (tertiary prevention). PFs also serve as a resource for practices that want to develop evidence-based behavioral interventions, such as smoking cessation programs.¹⁷

PFs work with the office staff to develop reminder systems for recalling and tracking patients.¹⁰ To increase the rate of preventive services and enhance chronic patient care, PFs assist with implementation of guidelines. PFs make these guidelines available and teach the office staff how to implement them.¹⁸ For example, facilitators provide education on evidence-based preventive services and service delivery models.¹⁷

Facilitators can participate in clinical research as research assistants.¹⁷ They generally focus on the practice-level implementation phase of research projects, serving as a resource for the practice. In this role, PFs have helped bridge the gap between academic researchers and clinicians. Facilitators have been especially effective in multi-center studies, where personal knowledge and regular contact with a large number of professionals and practices are necessary, and quality control is often difficult.^{16,24}

It has also been reported that facilitators enhance office staff involvement in research and continuous quality improvement (CQI) projects and generate a positive attitude toward change.^{9,12} In addition, they can help raise awareness, increase practice knowledge, strengthen partnerships,²⁵ and help with consensus building.¹⁰ Specifically, nurse training and empowerment has been an important aspect of the facilitator's work.²¹ PFs have helped practices develop the nurse role

within the practice and supported a better utilization of staff resources by increasing the nurses' responsibility in patient care. Particularly in England, facilitators have played an important role in assisting nurses to acquire and improve their clinical and administrative skills.²⁶⁻²⁸

The facilitator concept encourages a reevaluation of the traditional physician-centered practice.²⁹ Facilitators help providers use their human resources and expertise optimally by encouraging task reassignments to nurses, midlevel providers, and clinic staff. This approach relies on the clinician's willingness to share more responsibility with the clinic staff.

As more providers turn to electronic health records (EHRs) and other electronic office systems,³⁰ facilitators with information technology (IT) expertise provide low-cost technical support. This occurs both during the transitional process to EHRs and in maintenance of existing electronic systems.^{2,10,31}

Methods Used by Practice Facilitators

A common method used by PFs involves conducting chart audits. Based on these audits, PFs prepare reports, give feedback to the clinical staff, and assist them in planning the steps to bring about change. When conclusions are reached, or ideas for improvement are identified, they also help practices implement the changes.^{2,11} One of the most elaborate descriptions of facilitating change in primary care practices was provided by Atkins et al,³³ in which facilitators followed the "change management method" to ensure the success of effective and lasting interventions. They used the Practice Characterization Model (PCM) to draw up a tailored Practice Development Plan (PDP) to apply the most appropriate interventions to improve the work of the practice.

PFs also enhance communication and spread useful ideas between practice sites (cross-pollination). Primary care providers often work in isolation from each other, even in the same practice group, and generally do not share methods, ideas, or discovered practical solutions with each other. PFs can effectively connect providers and share ideas and resources, so that a network of clinicians functions as a learning community.²⁵

PFs use the Plan-Do-Study-Act (PDSA) cycle, a method integral to CQI to achieve lasting change through system-level interventions.^{20,34,35} In this method, a PF, often as a member of a quality improvement team, interacts with practice staff to plan the intervention, determine and assign tasks, study the effect of the intervention, and refine the intervention based on staff feedback and pilot results.

PFs also establish new connections between members of the same practice or different practices within a network of providers.³⁶ These connections are par-

ticularly important for rural practices that are isolated from metropolitan area resources (such as tertiary medical centers).

PFs implement different practice enhancement strategies alone or in combination to achieve and sustain change through system-level interventions.³⁷ Single strategies include group education, individual instruction (social interaction), feedback, and reminders. Combined strategies are education materials and feedback, group education combined with other strategies, individual instruction with other strategies, feedback and reminders, and feedback combined with peer reviews or academic detailing.

Impact on Practices and Patient Care Outcomes

Of the 47 articles we reviewed, 25 measured the effect of interventions involving facilitators on patient care outcomes. We have summarized the major findings of outcome studies utilizing PF interventions in Table 2. Only eight of the studies were randomized, controlled trials (RCTs), and seven of them investigated multi-component interventions in which practice facilitators were only a part. Table 3 demonstrates the methodological quality of the randomized clinical trials. We must note that in system-level improvement studies, blinding of study subjects to administrators of interventions is simply not feasible, or in some cases it would be deleterious to the intervention. Study designs and outcomes of the eight RCTs are detailed below (see Table 2 for details).

Frijling et al reported that feedback from facilitators increased the rates of diabetic foot and eye examinations in general practices in The Netherlands.¹¹ This was a cluster RCT including 124 practices and 185 general practitioners. The study did not address the direct effect of simply giving more attention to the intervention group (Hawthorne effect) versus the effect of the intervention itself.

In another study involving 98 physicians, Dietrich et al demonstrated that facilitators increased the number of office system interventions on cancer early detection and preventive services.^{13,38} The study did not examine which parts of the multifaceted intervention contributed to the improved outcomes.

Margolis et al examined the role of PFs in improving delivery systems for prevention in primary care in 44 practices.³⁹ The authors found that continuing education in combination with PF-facilitated process improvement methods is effective in increasing preventive service delivery rates for children.

Modell et al reported that nurse facilitators working with a team of primary care clinicians improved screening for carriers of hemoglobin disorders in 26 practices.²⁶ The facilitator intervention was particularly effective in practices in areas with a high prevalence of ethnic minorities.

In a rigorous, randomized study including 40 primary care practices, Baskerville et al and Lemelin et al demonstrated that nurse facilitators improved preventive care performance and successfully changed physician practice patterns.^{10,22}

Kinsinger et al reported that facilitators in 62 practices assisted community primary care physicians in an academic research team to implement an office system intervention for increasing breast cancer screening rates in 20 rural counties in North Carolina.³²

Goodwin et al described a group randomized clinical trial to test a practice-tailored approach to increase the delivery of preventive services, particularly through health habit counseling.²⁴ They found that the tailored approach to increase a range of evidence-based preventive services can enhance the potential of practices to meet the preventive needs of their patients.

Bryce et al tested whether an audit facilitator could change the pattern of diagnosis and treatment of childhood asthma in an RCT (3,373 children ages 1–15 years) conducted at the University of Dundee in the United Kingdom.⁴⁰ The inclusion of an audit facilitator in 12 Tayside clinics led to favorable changes in the process of care of childhood asthma.

Other investigators have reported that proper utilization of facilitators may result in better patient care without increasing costs, but this effect did not last after the facilitator stopped visiting the clinics.¹² The facilitator model appears to be optimal for small or medium-size practices.¹² Large practices are less likely to be able to use the resources of the facilitator due to the scale of operations necessary for quality improvement. The net cost savings generated by the facilitator might justify the costs associated with the employment of the facilitator, depending on whether one considers short-term or long-term outcomes.¹⁶

Use of Practice Facilitators in PBRNs in the United States

At least 11 primary care PBRNs in the United States use PFs. Areas of facilitator activity within US PBRNs include coordination of research projects, development and implementation of system-level interventions such as immunization and preventive services, chronic disease management, chart audits, feedback for quality improvement, and patient education.^{2,41}

For example, the Oklahoma Physicians Resource/Research Network (OKPRN) uses five full-time equivalent (FTE) facilitators, called practice enhancement assistants (PEAs). The PEAs help member practices participate in individual and network-wide research and quality improvement projects. Initial PEA training includes a comprehensive introduction program followed by project-specific training (Table 4). PEA training materials are published in a PEA Training Manual. PEAs are funded from academic grants and

Table 2

Outcome Studies of Practice Facilitator Interventions

<i>Study Type</i>	<i>Study Outcome</i>	<i>Type of Study</i>	<i>Year of Publication</i>
Prevention	Feedback reports and support by the facilitator increased diabetic eye and foot examination rates in primary practice. ¹¹	RCT	2002
	Quality improvement of preventive care performance was associated with implementation of information technology, staff involvement or staff turnover, characteristics of the facilitator, relationship between the facilitator and the practice. ⁹	Case control study	2002
	Facilitator-assisted office system intervention resulted in an increase in mammography, recommendation to do breast self-exams, clinical breast exams, fecal occult blood testing, and advice to quit smoking. ¹³	RCT	1992
	Facilitators enhanced the understanding and utilization of smoking cessation toolkits but not cost-effectively. ¹⁷	Before/after study of three intervention groups	1992
	Facilitators helped enhance preventive service delivery rates in a 1-year follow-up trial. ²⁴	RCT	2001
	Facilitators improved preventive services performance and modified physician practice patterns in a multifaceted intervention. ^{10, 22}	RCT	2001
	Facilitators helped increase prevention rates for cardiovascular disease in multidisciplinary primary care teams. ³	Before/after study	1987
Chronic Disease Management	Facilitators were cost-effectively utilized as general auditors in diabetic retinal photographic screening. ⁸	Case control study	1999
	Facilitators helped improve preventive cardiovascular structure-of-care indicators in general practices. ⁴²	Before/after study	2003
	Improving the pattern of diagnosis and treatment of childhood asthma justified the deployment of facilitators. ^{10, 45}	Before/after study	1997, 1995
	Facilitators improved diabetes quality-of-care measures utilizing the best practices approach combined with health information technology. ²	Before/after study	2003
	Facilitators helped increasing general practitioner involvement in diabetes care and amelioration of identified constraints. ⁴³	Before/after study	1992
Improved Relationships	Facilitators were essential in reaching out to isolated rural practices in practice-based research networks. ⁴⁴	Descriptive analysis	2001
Professional Education	Intensive presence of the facilitator was necessary to maintain the effect of improvements made in a practice. ¹²	Before/after study	1999
	Facilitators improved the recognition of psychiatric illnesses by general practitioners. ¹⁸	Before/after study	2000
System-level Improvements	Clinic staff was more willing to implement changes when they were persuaded that it benefited the health of a significant portion of their patients. This task was ideally done by a facilitator via literature review, feedback, and providing materials. ²⁶	RCT	1998
	Extent of understanding and implementation of quality improvement methodology was significantly higher in practices with facilitators. Practice team members' attitudes improved. ²⁹	Before/after study	1996
	Facilitator interventions very significantly increased proper documentation of vital signs and smoking status. ²¹	Before/after study	1987
	Facilitators helped improve the management of prescription refills in primary care practices through a quality improvement process in a multi-professional team. ³⁴	Before/after study	1999
	Facilitators assisted in testing an academic research team approach to increase breast cancer screening rates in community primary care practices. ³²	RCT	1998
	Facilitators enhanced the utilization of health summary sheets and patient recall systems. ⁴⁵	Before/after study	1993
	Facilitators increased preventive service delivery rates through office systems implementation in a practice improvement team. ⁴⁶	Before/after study	2001
Facilitators successfully supported quality improvement programs for primary health care teams and sustained practice changes. ⁴⁷	Before/after study	1998	

RCT— randomized clinical trial

Table 3

Methodological Quality of Randomized Clinical Trials (RCTs)*

RCT Study	1	2	3	4	5	6	7	8	9	10	11	Total
Frijling et al, 2002 ¹¹	+	+	+	+	-	-	?	+	-	+	+	7
Dietrich et al, 1992 ¹³	+	+	-	+	-	-	?	+	-	+	+	6
Modell et al, 1998 ²⁶	+	+	-	+	-	-	?	+	-	+	+	6
Baskerville et al, 2001 ¹⁰	+	+	+	+	-	-	?	+	-	+	+	7
Kinsinger et al, 1998 ³²	+	+	+	+	-	-	+	+	-	+	+	8
Margolis et al, 2004 ³⁹	+	+	+	+	-	-	?	+	-	+	+	7
Goodwin et al, 2001 ²⁴	+	+	-	?	-	-	?	+	-	+	+	5
Bryce et al, 1995 ⁴⁰	+	+	+	?	+	-	-	+	+	+	+	8

* Scores in PEDro Scale. Total score is determined by counting number of criteria satisfied. “+” criterion was clearly satisfied, “-” not satisfied, “?” unclear whether it was satisfied

1. Eligibility criteria were specified.
2. Subjects were randomly allocated to groups.
3. Allocation was concealed.
4. Groups were similar at baseline.
5. Subjects were blinded.
6. Those who administered the intervention were blinded.
7. Assessors were blinded.
8. Measurements of key outcomes were obtained from >85% of subjects.
9. Data were analyzed by intention to test practice facilitator intervention.
10. Statistical comparisons between groups were conducted.
11. Point measures and measures of variability were provided.

renewable contracts. Other PBRNs in the United States have also reported using PFs. For example, the Oregon Rural Practice-based Research Network (ORPRN) uses practice enhancement and research coordinators (PERCs) as project managers to find the balance between practice enhancement and research coordination. The Western New York Practice-based Research Network (WNYPRN) has recently implemented the Oklahoman PEA model and started recruiting physicians with the PEAs' help. The Wisconsin Research Network (WReN) and the Arkansas Research Collaborative (ARC) have also reported that PFs participate in their research projects. Research Network (ResNet) employs 3.5 FTE trained clinical study assistants (CSAs) in a variety of research projects who assist participating clinics in studies. The Alabama Practice-based Research Network (APBRN) uses community health advisors (CHAs) who receive rigorous training and work closely with providers on smoking cessation and obesity projects. Four other PBRNs indicated that they plan to use PFs in the future.

Table 4

Topics Covered in Practice Enhancement Assistant (PEA) Training

- Administrative and departmental procedures
- Human subjects protection training
- Health Insurance Portability and Accountability Act (HIPAA) training
- Research skills
- Chart auditing
- Rapid cycle quality improvement process
- Group facilitation
- Practice visits (shadowing PEAs in practices)
- Health information technology utilization (PDAs, PCs, applications, clinical databases)
- Clin-IQ Process
- Notebooks from past and ongoing studies
- Best practices study process
- Preventive services guidelines and implementation
- Billing and coding
- Electronic Practice Record that includes demographics, progress notes, and plans for practice sites
- Handouts, education materials, PEA resources
- Project-specific training

Many quality improvement organizations also use professionals on the state level who engage in activities similar to that of the PFs in a contractual relationship but not in the context of a PBRN (eg, Lumetra, Calif; HealthInsight, UT-NV; OFMQ, OK, etc).

Conclusions

The PF concept originated from the facilitator model developed in Oxford, England in 1982–1984. PFs are health care professionals who assist primary care providers in a variety of research and quality improvement activities. PFs are usually hired and trained by academic or government health care organizations for particular projects and/or work closely with a set of practices over an extended period of time.

PFs increase preventive service delivery rates, improve relationships and communication between providers and practices, assist clinicians with chronic disease management, provide professional education, and facilitate system-level improvements using CQI methodologies. A number of PF interventions have improved practice processes and patient care outcomes, though much more research is needed on the effect and cost-effectiveness of using PFs. At least 11 PBRNs in the United States use or are planning to use PFs.

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REFERENCES

- Cook R. Primary care. Facilitators: looking forward. *Health Visit* 1994;67(12):434-5.
- Nagykaldis Z, Mold JW. Diabetes Patient Tracker, a personal digital assistant-based diabetes management system for primary care practices in Oklahoma. *Diabetes Technol Ther* 2003;5(6):997-1001.
- Fullard E. Extending the roles of practice nurses and facilitators in preventing heart disease. *Practitioner* 1987;231(1436):1283-6.
- Elliott A. General practice facilitator—a personal view. *Health Trends* 1984;16(4):74-9.
- Fullard E, Fowler G, Gray M. Facilitating prevention in primary care. *Br Med J (Clin Res Ed)* 1984;289(6458):1585-7.
- Fossum S. [The health consultant. A new profession]. *Tidsskr Nor Laegeforen* 1990;110(8):988-90.
- Rotem A, Youngblood P, Harris P, Godwin P. Becoming a GP facilitator. A training approach. *Aust Fam Physician* 1996;25(3):378-81.
- McKenzie A, Grylls J. Diabetic retinal photographic screening: a model for introducing audit and improving general practitioner care of diabetic patients in a rural setting. *Aust J Rural Health* 1999;7(4):237-9.
- Hogg W, Baskerville N, Nykiforuk C, Mallen D. Improved preventive care in family practices with outreach facilitation: understanding success and failure. *J Health Serv Res Policy* 2002;7(4):195-201.
- Baskerville NB, Hogg W, Lemelin J. Process evaluation of a tailored multifaceted approach to changing family physician practice patterns improving preventive care. *J Fam Pract* 2001;50(3):W242-9.
- Frijling BD, Lobo CM, Hulscher ME, et al. Multifaceted support to improve clinical decision making in diabetes care: a randomized controlled trial in general practice. *Diabet Med* 2002;19(10):836-42.
- Geboers H, van der Horst M, Mookink H, et al. Setting up improvement projects in small-scale primary care practices: feasibility of a model for continuous quality improvement. *Qual Health Care* 1999;8(1):36-42.
- Dietrich AJ, O'Connor GT, Keller A, Carney PA, Levy D, Whaley FS. Cancer: improving early detection and prevention. A community practice randomised trial. *BMJ* 1992;304(6828):687-91.
- Rowan P. Clinical facilitators: a new way of working. *Nurs Stand* 2000;14(52):35-8.
- Beckett C, Wall M. Role of the clinical facilitator. *Nurse Educ Today* 1985;5(6):259-62.
- McCowan C, Neville RG, Crombie IK, Clark RA, Warner FC. The facilitator effect: results from a 4-year follow-up of children with asthma. *Br J Gen Pract* 1997;47(416):156-60.
- Cockburn J, Ruth D, Silagy C, et al. Randomised trial of three approaches for marketing smoking cessation programmes to Australian general practitioners. *BMJ* 1992;304(6828):691-4.
- Bashir K, Blizard B, Bosanquet A, Bosanquet N, Mann A, Jenkins R. The evaluation of a mental health facilitator in general practice: effects on recognition, management, and outcome of mental illness. *Br J Gen Pract* 2000;50(457):626-9.
- Havelock PB, Schofield T, Tapsfield J. Health promotion in primary care: the British perspective. *Am J Prev Med* 1994;10(3 Suppl):S33-S35.
- Carroll L, Thirlwall M, Wilson A. Medical audit and the role of the facilitator. *Int J Health Care Qual Assur* 1994;7(3):8-10.
- Fullard E, Fowler G, Gray M. Promoting prevention in primary care: controlled trial of low technology, low cost approach. *Br Med J (Clin Res Ed)* 1987;294(6579):1080-2.
- Lemelin J, Hogg W, Baskerville N. Evidence to action: a tailored multifaceted approach to changing family physician practice patterns and improving preventive care. *CMAJ* 2001;164(6):757-63.
- Fowler G, Fullard E, Gray M. Facilitating prevention in primary care. *BMJ* 1992;304(6835):1177.
- Goodwin MA, Zyzanski SJ, Zronek S, et al. A clinical trial of tailored office systems for preventive service delivery. The Study to Enhance Prevention by Understanding Practice (STEP-UP). *Am J Prev Med* 2001;21(1):20-8.
- Mold JW, Peterson KA. Primary care practice-based research networks: working at the interface between research and quality improvement. *Ann Fam Med* 2005;3(suppl 1):S12-S20.
- Modell M, Wonke B, Anionwu E, et al. A multidisciplinary approach for improving services in primary care: randomised controlled trial of screening for haemoglobin disorders. *BMJ* 1998;317(7161):788-91.
- Sharpe J, Atkinson R. The role of the diabetes facilitator in providing care. *Community Nurs* 1999;5:31-2.
- McBride A, Moorwood Z. The hospital health-promotion facilitator: an evaluation. *J Clin Nurs* 1994;3(6):355-9.
- Lawrence M, Packwood T. Adapting total quality management for general practice: evaluation of a programme. *Qual Health Care* 1996;5(3):151-8.
- Andrews JE, Pearce KA, Sydney C, et al. Current state of information technology use in a US primary care practice-based research network. *Inform Prim Care* 2004;12:11-8.
- Mold JW. Use of practice enhancement assistants (PEAs) in practice-based research. In: Convocation of Practices, AAFP National Research Network, March 18–21, 2004. Leawood, Kan: American Academy of Family Physicians, 2004.
- Kinsinger LS, Harris R, Qaqish B, Strecher V, Kaluzny A. Using an office system intervention to increase breast cancer screening. *J Gen Intern Med* 1998;13(8):507-14.
- Atkins EM, Duffy MC, Bain DJ. The practice characterization model: the importance of organizational life cycles and targeted interventions in general medical practice. *Int J Health Plann Manage* 2001;16(2):125-38.
- Cox S, Wilcock P, Young J. Improving the repeat prescribing process in a busy general practice. A study using continuous quality improvement methodology. *Qual Health Care* 1999;8(2):119-25.
- Solberg LI, Reger LA, Pearson TL, et al. Using continuous quality improvement to improve diabetes care in populations: the IDEAL model. Improving care for diabetics through empowerment, active collaboration, and leadership. *Jt Comm J Qual Improv* 1997;23(11):581-92.
- Astrop P. Facilitator—the birth of a new profession. *Health Visit* 1988;61(10):311-2.
- Wensing M, Grol R. Single and combined strategies for implementing changes in primary care: a literature review. *Int J Qual Health Care* 1994;6(2):115-32.
- Carney PA, Dietrich AJ, Keller A, Landgraf J, O'Connor GT. Tools, teamwork, and tenacity: an office system for cancer prevention. *J Fam Pract* 1992;35(4):388-94.

39. Margolis PA, Lannon CM, Stuart JM, Fried BJ, Keyes-Elstein L, Moore DE, Jr. Practice-based education to improve delivery systems for prevention in primary care: randomised trial. *BMJ* 2004;328(7436):388.
40. Bryce FP, Neville RG, Crombie IK, Clark RA, McKenzie P. Controlled trial of an audit facilitator in diagnosis and treatment of childhood asthma in general practice. *BMJ* 1995;310(6983):838-42.
41. Niebauer L. Practice research coordinators. In: North American Primary Care Research Group Annual Meeting. Banff, Alberta, Canada: North American Primary Care Research Group, 2003.
42. Frijling B, Hulscher ME, van Leest LA, et al. Multifaceted support to improve preventive cardiovascular care: a nationwide, controlled trial in general practice. *Br J Gen Pract* 2003;53(497):934-41.
43. Jones JN, Marsden P. Improved diabetes care in a UK health district. *Diabet Med* 1992;9(2):176-80.
44. Laurence CO, Beilby JJ, Marley JE, Newbury J, Wilkinson D, Symon B. Establishing a practice-based primary care research network. The University Family Practice Network in South Australia. *Aust Fam Physician* 2001;30(5):508-12.
45. Crotty M, Litt JC, Ramsay AT, Jacobs S, Weller DP. Will facilitators be acceptable in Australian general practice? A before and after feasibility study. *Aust Fam Physician* 1993;22(9):1643-7.
46. Bordley WC, Margolis PA, Stuart J, et al. Improving preventive service delivery through office systems. *Pediatrics* 2001;108(3):E41.
47. Hearnshaw H, Reddish S, Carlyle D, Baker R, Robertson N. Introducing a quality improvement program to primary health care teams. *Qual Health Care* 1998;7(4):200-8.