

Primary Care Research: Barriers and Opportunities

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A paucity of relevant scientific evidence limits the ability of the primary care disciplines to practice evidence-based medicine and to advocate for health care policy. Significant barriers to primary care research still exist, including difficulties in translating practice-based wisdom into methodologically sound research, the lack of a critical mass of researchers, a poorly developed research culture, and competing demands faced by investigators. In addition, the categorical nature of most available research funding is unfavorable for the generalist focus of primary care research.

Efforts to advance primary care research will require support from health care organizations, dedicated federal and state funding sources, and foundations. In ad-

dition, there is a need to provide sophisticated methodological training for a small cadre of primary care researchers while increasing opportunities for a large number of clinicians to participate in research. Opportunities for transdisciplinary collaboration need to be increased, including the creation of primary care research centers.

The development of a scientific basis for primary care practice will require policy advocacy, development of infrastructure, and creative and sustained individual effort.

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Primary care practice is experiencing unprecedented growth and recognition as a central feature of health care delivery and reform.^{1,2} Primary care has traditionally focused on practice rather than research. This focus on "taking care of the folks"³ has positioned the primary care specialties as leaders in meeting most health care needs of the population. The focus of primary care clinicians on practice, however, and the focus of primary care academicians on education has left primary care clinicians to practice without a relevant scientific knowledge base⁴ or based on "hand-me-down tertiary care knowledge."⁵ Policy advocates for primary care approaches are similarly left without a strong scientific base upon which to make decisions.

Research is needed to increase our understanding of the primary care setting and our approach to patients.⁴

Yet significant barriers to primary care research exist.^{6,7} This paper addresses barriers and opportunities in five aspects of the primary care research process and closes with recommendations for policymakers and researchers.

Barriers and Opportunities

Primary care research depends on the work of motivated, trained *investigators* operating in supportive *environments*. Beginning with innovative *ideas* grounded in practice, good primary care research applies rigorous *methods* using opportunities created by adequate *funding*. There are barriers and opportunities in each of these aspects of the research process (Table).

Investigators

The lack of a critical mass of investigators is a major impediment to primary care research. Typically, researchers with methodological skills have little opportunity for creative collaborative interactions with primary care clinicians, who are closest to patients and therefore more at-

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Table. Factors Affecting Primary Care Research: Barriers and Opportunities

Factor	Barriers	Opportunities
Investigators	Lack of critical mass Competing demands	Training Incubator environments
Infrastructure/ environment	Limited number of mentors Lack of a research culture	Multiple mentors Transdisciplinary collaboration
Ideas	Reductionistic vs generalist models Lack of operationalized theory	Seeking the perspective of primary care clinicians Development of grounded theories Focus on effectiveness research
Methods	Hard-to-measure variables Classic study designs do not fit the questions Access to relatively unselected populations	Adapting measures from other disciplines Development of new measures Multi-method approaches Development of primary care research laboratories
Funding	All the above Square peg in a round hole phenomenon Categorical review and funding	Linking primary care perspective to other funding priorities Agency for Health Care Policy and Research Foundations Partnership with managed care and payer organizations Federal and state agencies devoted to developing and supporting primary care research

tuned to the important questions. In addition, the opportunities that are created by renewed interest in primary care create an environment of competing priorities for potential and actual primary care researchers.⁸ The increasingly large difference in compensation between practice and academic positions creates a strong disincentive for primary care clinicians to pursue research careers. Increasing demands in patient care and teaching⁵ make it difficult for primary care clinicians and academicians to channel their energies into innovative, cutting-edge research.

Participation in research-focused postresidency fellowships⁹ and faculty development fellowships¹⁰ is associated with greater research productivity. A small cadre of sophisticated primary care investigators with skills in advanced research methods could be developed through some expansion of the current fellowships. It is important that these fellowships include strong training in method-

ological skills and opportunities for hands-on research experience, while providing grounding in the primary care perspective. In addition, offering a limited but exciting research training experience during primary care residencies, combined with training in population-focused¹¹ and evidence-based medicine,¹² also could develop over time a critical mass of sophisticated practitioners to carry out practice-based research and to participate in research networks.

Infrastructure and Environment

Primary care lacks a well-developed research culture. Patient care and teaching tend to be valued over research. This leads to a lack of professional socialization in the research process.^{13,14} Opportunities exist for inexperienced primary care researchers to develop relationships with multiple mentors. Fledgling primary care researchers are well served by proactively identifying specific needs that would be met by a mentoring relationship.¹⁵

There is a great need to develop incubator environments that will support junior researchers' development and growth as primary care researchers. The Robert Wood Johnson Generalist Physicians Faculty Scholars Program is a national example that is providing mentorship and opportunities for a small number of junior primary care researchers. By providing support, credibility, and mentoring on a national basis, the program helps to develop local incubators for the development of primary care researchers.

Although successful research requires individual leadership, the development of transdisciplinary teams and collaboration can foster the scholarly development and professional socialization of junior primary care researchers. Collaborative teams involving partnerships between clinicians and academic medical centers or managed care organizations can allow primary care researchers who are facing multiple demands to share some of the burdens and opportunities.

Practice-based research networks are a major resource for primary care research that integrates practical practice perspectives and access to relatively unselected patient populations in real-world settings.¹⁶ The full potential of practice-based research, which is yet to be realized, would be enhanced by the expansion and support of the practice infrastructure for research through data systems, staff training, and greater clinician involvement.

Ideas

Original ideas in the form of research questions and hypotheses that are grounded in a primary care perspective

are tremendously important if primary care is to develop a unique and relevant body of knowledge. One significant barrier is the dominance of the reductionistic biomedical model. While focusing narrowly on a researchable question is important in any kind of research, this reductionistic paradigm is very different from the generalist perspective. Its dominance in academic medical centers, however, often constrains the thinking of people who are trying to do primary care research that emphasizes care of the whole patient in the context of family and community.

Primary care researchers tend to engage in an eclectic mix of research topics, stimulated by the diversity of patients and problems in the scope of primary care practice. Sustaining a research trajectory of successive inquiries into an area of focused expertise, while retaining a generalist perspective, is a major challenge for primary care researchers.

Primary care researchers also need to embrace advances in biomedical technology as primary care research opportunities. For example, there is great potential for advances in molecular biology to lead to genetic screening and treatment.¹⁷ The widespread application of such techniques is dependent not only on further advances in molecular biology technology, but on answering practical primary care questions that will affect translation into practice. How do patients and clinicians interpret genetically based risk?^{18,19} What are the positive and negative consequences of genetic screening?^{17,20} Among the competing demands of the primary care setting, how can we identify high-risk patients who would be most likely to benefit from genetic screening and treatment?

Rather than developing a coherent set of theories applicable to practice, primary care practitioners focus on what works in caring for patients.⁸ Additionally, many of primary care's theoretical underpinnings²¹⁻²⁵ have not been adequately operationalized into research questions and measurable constructs. Operationalizable models of generalist approaches to patient care are needed to guide research²⁶; for example, how do physicians make decisions when facing competing demands,²⁷ or what is the effect of continuity on patient outcomes?

The *primary care setting* and the *generalist perspective* are two important components that characterize primary care research. Seeking the ideas of primary care clinicians and the perspective of patients is essential to the development of any agenda for primary care research. For example, the Ambulatory Sentinel Practice Network (ASPN) develops its research priorities and questions from the experience of participating practicing physicians.²⁸ We need to use practice-based wisdom¹⁶ and emerging data from primary care research to develop grounded theories that make sense in primary care settings. This process naturally leads to a focus on effectiveness and outcomes

research, particularly on outcomes that are important to patients and policy.^{29,30}

Methods

Many of the traditional research laboratories, measures, and designs are not directly relevant to primary care. The lack of relevant methods tends to constrain us to "look under the light," whereas many of the problems and solutions are in the darkness of the complexity of the primary care setting.

Some of the methodological barriers include accessing relatively unselected primary care populations or subsets of high-risk groups among the populations seen in primary care settings. Practice-based networks can help us address this problem by taking research out of the academic medical center and into the primary care setting where its findings will be applied.

When primary care researchers talk about hard science, what they really mean is that the important variables are hard to measure. Health services and primary care researchers have advanced the measurement of health status, quality of life, and other constructs that are important to primary care research. These measures need to be more widely adapted and applied to primary care research questions.

Much of the primary care research to date has been descriptive.^{31,32} There is a need for greater use of stronger experimental study designs that examine primary care research questions.³³

At the Institute of Medicine invitational workshop on the Scientific Base of Primary Care, I was struck by the schism between the shared *research paradigm* that requires narrowing the focus and isolating phenomena from their contexts, and the *patient stories* that kept bubbling up from clinicians. This conflict between isolating as opposed to embracing the patient perspective and context is at the core of the uneasiness felt by primary care researchers who are trying to achieve methodological rigor while still asking the right questions and addressing the context of the patient's environment and values. Many primary care research questions require methods that include measurement and assessment of the effect of context, in addition to isolating the phenomenon under study from its context. Therefore, multimethod approaches represent a major opportunity for primary care research. These approaches combine some of the quantitative techniques from epidemiology, health services research, and biomedicine with inductive, qualitative techniques that focus simultaneously on meaning and context.³⁴

For example, my colleagues and I are involved in a study that includes an examination of time use and preventive service delivery in a practice-based network of 138

family physicians, the Research Association of Practicing Physicians. We have had to adapt some measures from other disciplines, and develop many new measures that are applicable in the primary care context. Nurses conducting research for the study gathered data on the content and context of the outpatient primary care patient visit and on preventive service delivery. Multiple data sources provided the perspective of the patient, clinician, the medical record, and billing data. In addition, the nurses' direct observations were also used to document what services are delivered and to quantitate how time was spent during the visit.³⁵ At the same time, the nurses made qualitative observations and developed questions that did not fit a priori hypotheses and were not captured by the quantitative data-collection techniques. These qualitative observations about context, the study design, or new hypotheses and measures were captured by ethnographic field notes. Analysis of these field notes is being used to critique the study methods, to develop new hypotheses and new quantitative measures, and to explain the meaning of the quantitative study findings.

Such multimethod approaches represent an opportunity to combine rigorous epidemiological study designs and quantitative measures with grounded qualitative techniques that focus on meaning. The marginal cost of adding brief qualitative techniques to examine meaning and context is very small in studies that are already doing quantitative data collection.³⁶ Such multimethod research approaches were the focus of a recent conference on primary care research methods.³⁷

Funding

All the barriers to primary care research described above are also barriers to funding. Funding primary care research often feels like trying to put a square peg in a round hole. The primary care perspective does not fit the categorical paradigm and agendas of most funding agencies or specialist-dominated scientific review committees.

Researchers with true primary care questions do not have a funding home to support their finding answers to those questions. To fund their research, many primary care researchers link and often subjugate their primary care perspective to other funding priorities. If primary care research is to advance beyond entry level or marginally relevant studies, a dedicated funding base must be developed.

Managed care organizations emphasize primary care as the backbone of their health care delivery systems,³⁸ but they are in great need of information to improve the delivery of health care services to the populations they serve.^{39,40} Managed care organizations that are able to take a long-term perspective will find great benefit in

supporting primary care research. There is an urgent need for such organizations and practitioners to develop and implement low-overhead mechanisms to collect and analyze primary care data. Such data systems can meet both continuous quality improvement and research agendas and have the potential to make primary care research a relatively self-sustaining enterprise.

The central role of primary care as an agent for change within the health care system^{1,41} makes primary care a logical focus for the research agendas of some of the major foundations interested in health care. In addition, a federal funding program devoted to developing and supporting primary care research is needed to allow primary care researchers to come out of the closet with a primary care perspective and to start asking questions that do not conform to the categorical way the National Institutes of Health and other funding agencies are currently configured.

The Agency for Health Care Policy and Research (AHCPR) has funded a small number of primary care research projects and has recently designated a Center for Primary Care Research. Two of its scientific review committees represent primary care and health services research perspectives. Although this is an important start, AHCPR is undergoing considerable uncertainty about its future, and the funds available for extramural research are relatively small. Unless primary care becomes a major focus of an agency, primary care research development is likely to languish or be subjugated to other agendas.

Recommendations

Policy Recommendations

Training for primary care researchers needs to be expanded⁷ in ways that foster transdisciplinary collaborations. To do this, we need to identify groups of primary care clinicians willing to identify the important questions and to serve as research partners by using their practices as primary care research laboratories. A smaller cadre of dedicated primary care researchers should receive sophisticated training in research methods in settings that facilitate exposure to the generalist perspective and setting.

Expanding career development awards in primary care research⁷ through both private and governmental sources would allow primary care researchers to take the risks required for truly innovative primary care research. In academic environments, there is increasing pressure to do safe research that yields short-term, if modest, results. If we want to encourage researchers to innovate, we need to provide support for longer periods to allow them to risk

and survive the temporary setbacks that are inherent in cutting-edge research.

Multidisciplinary primary care research forums are needed to foster transdisciplinary collaboration³⁷ between primary care researchers and health services researchers, basic scientists, social scientists, methodologists, and clinicians. Previously, AHCPR sponsored three interdisciplinary primary care research conferences.^{42,43} Shared leadership of such forums by primary care professional organizations,⁴⁴ and co-funding by interested foundations, government agencies, and perhaps managed care organizations, would greatly advance primary care research through shared ideas and development of a national primary care research culture.

Establishing primary care research centers would develop a critical mass of geographically proximate researchers who could focus on the development of grounded primary care ideas, theories, and measures and apply them to answering primary care research questions in relatively unselected primary care populations. Such centers should have expertise in measurement and research methods. They should have established mechanisms for the grounded development and operationalization of primary care research questions on "the problems that most of the people have most of the time."⁴⁵ Primary care research centers also need to have practice-based laboratories and data systems, so that research can be conducted in both the context and setting of primary care.^{3,28-30} Redistribution of a small portion of the current federal research budget to foster such centers would be a worthwhile investment. Pursuing funding of such centers on the state level and through large managed care organizations and local philanthropists may be viable options in the immediate future.

Primary care representation on review committees and editorial boards needs to be increased so that there are avenues for people with a primary care perspective to have a forum for true peer evaluation of their work, which is essential to fair review.⁴⁶

Establishing a federal agency committed to primary care research is essential to the advancement and long-term survival of primary care research.⁷ An additional critical opportunity is to develop a primary care research infrastructure based on stable funding from managed care organizations. The essential role of primary care within any organized, efficient, and effective health care system must be based on a sound scientific basis. Managed care organizations that want to thrive in increasingly competitive environments will find that supporting a primary care research infrastructure is a good investment. There are already examples of the usefulness of this type of investment.^{39,40,47}

Recommendations for Primary Care Researchers

Successful researchers have an ability to conceptualize ideas, translate an idea into a research project, and communicate ideas and information. Hard work, conceptual ability, and training that involves experience in supervising but independent research may be particularly important.⁴⁸ Clear expectations and support from a department chair or division chief are associated with faculty research productivity,⁴⁹ whereas collaboration with a practice-based research network or primary care research division enhances the ability of busy clinicians to actively participate in research. Instrumental support, including space, dedicated research assistants, computers, access to methodologists, and collegial professional relationships,⁵⁰ is essential to most research enterprises.⁵¹

Successful researchers meld ideas and opportunities. Good research ideas involve questions to which the researcher brings a passionate interest, local resources, and potential collaborators, and for which the answers have a high level of potential impact.⁵² Primary care researchers tend to have diverse interests because of their generalist perspective, training, and predisposition. Success is often enhanced, however, by choosing a niche in which particular expertise is developed.⁵² Primary care research ideas often come from practice or from interactions with other practitioners, theoreticians, or researchers. They can be enhanced by gaining the perspective of other disciplines.

Successful researchers work on multiple projects.⁵² If more than one iron is in the fire, and one cools off, the researcher can pick up another one and continue working. Working on multiple projects also allows researchers to take a chance on developing a high-risk, high-gain idea.

Successful researchers walk before they run. This means conducting pilot studies before attempting to fund and carry out a large project. It can also mean paying "dues" by working on other researchers' projects, while learning and developing a track record in the process.

In the same way that developing a new biological assay opens up research opportunities for the bench researcher, developing new methods, particularly new measures or access to understudied populations, opens up new opportunities for individual and collaborative work for primary care researchers.

Successful researchers seek out critical feedback early and often. This helps minimize the loss involved in abandoning a fatally flawed project and provides opportunities to refine other projects at multiple stages of planning, implementation, and dissemination.

It is critical in primary care research to develop collaborative teams that foster the sharing of ideas, expertise, and work. The function of such teams is enhanced by an

"abundance mentality,"⁵³ in which colleagues avoid the misperception that resources are a finite pie in which a larger slice for someone else means a smaller piece for themselves. Rather, pooling resources and expertise creates a bigger pie of which everyone gets a bigger piece.

Primary care research has often been conducted on a shoestring budget. Seeking out adequate funding allows the primary care researcher to use sophisticated data-collection techniques on an adequate sample size and apply advanced study designs to achieve the necessary rigor to have an impact. In order to be funded, researchers need to "sell the sizzle" by arguing the importance of their project. They need to "sell the steak" by having developed feasible methods and an expert team with the credibility to carry out the proposed work.

Finally, primary care researchers need to write. Writing is hard work. Finding blocks of uninterrupted time among the competing demands of primary care is a great challenge⁵⁴ that must be met if primary care research is to be disseminated.

Conclusions

Recognition of the importance of primary care is producing a plethora of opportunities for the primary care disciplines. Primary care researchers face the competing demands of providing primary care health services, meeting increased teaching and training needs, and filling a growing number of leadership and administrative roles.⁵ These competing demands have the potential to undermine the development of a scientific base for primary care, just as we reach the crossroads of great need and opportunity. How well we meet this challenge will be determined by the ability of policymakers and primary care leaders and researchers to adopt the long-term perspective that is required to advance primary care research closer to the top of our country's health care agenda. Assigning high priority to primary care research will provide the scientific underpinning for meeting America's most important health care needs.

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References

1. Starfield B, Simpson L. Primary care as part of US health services reform. *JAMA* 1993; 269:3136-9.

2. Geyman JP, Hart LG. Primary care at a crossroads: progress, problems, and future projections. *J Am Board Fam Pract* 1994; 7:60-70.
3. Stange KC. Practice-based research networks: their current level of validity, generalizability, and potential for wider application. *Arch Fam Med* 1993; 25:570-5.
4. Franks P, Nutting PA, Clancy CM. Health care reform, primary care, and the need for research. *JAMA* 1993; 270:1449-53.
5. Weiss BD. The death of academic family medicine: can it be prevented? *Fam Med* 1995; 27:139-42.
6. Budetti PP. Perspectives on the development of primary care research. In: Hibbard H, Nutting PA, Grady ML, eds. Primary care research: theory and methods. AHCPH conference proceedings. Rockville, Md: Agency for Health Care Policy and Research, publication No. 91-001, 1991.
7. Task Force on Building Capacity for Research in Primary Care. Putting research into practice. Task force report. Agency for Health Care Policy and Research, Department of Health and Human Services, Washington, DC, 1993.
8. Culpepper L. Family medicine research: major needs. *Fam Med* 1991; 23:10-4.
9. Curtis P, Reid A, Newton W. The primary care research fellowship: an early assessment. *Fam Med* 1992; 24:586-90.
10. McGaghie WC, Bogdewic S, Reid A, Arndt JE, Stritter FT, Frey JJ. Outcomes of a faculty development fellowship in family medicine. *Fam Med* 1990; 22:196-200.
11. Greenlick MR. Educating physicians for population-based clinical practice. *JAMA* 1992; 267:1645-8.
12. Evidence-Based Medicine Working Group. Evidence-based medicine: a new approach to teaching the practice of medicine. *JAMA* 1992; 268:2420-5.
13. Hekelman FP, Zyzanski SJ, Flocke SA. Successful and less-successful research performance of junior faculty. *Res Higher Educ* 1995; 36:235-55.
14. Bland CJ, Ruffin MT. Characteristics of a productive research environment: literature review. *Acad Med* 1992; 67:385-97.
15. Stange KC, Hekelman FP. Mentoring needs and family practice faculty. *Fam Med* 1990; 22:183-5.
16. Nutting PA. Practice-based research networks: building the infrastructure of primary care research. *J Fam Pract* 1996; 42:199-203.
17. Doukas DJ. Primary care and the human genome project. *Arch Fam Med* 1993; 2:1179-83.
18. Offit K, Brown K. Quantitating familial cancer risk: a resource for clinical oncologists. *J Clin Oncol* 1994; 12:1724-36.
19. McCrary SV, Allen B, Moseley R, et al. Ethical and practical implications of the human genome initiative for family medicine. *Arch Fam Med* 1993; 2:1158-63.
20. Murray TH. Genetics and the moral mission of health insurance. *Hastings Cent Rep* 1992; 22:12-17.
21. White KL, ed. The task of medicine. Menlo Park, Calif: The Henry J. Kaiser Family Foundation, 1988.
22. McWhinney IR. General practice as an academic discipline: reflections after a visit to the United States. *Lancet* 1966; 1:419-23.
23. Stephens GG, Amundson LH, Bishop FM, et al. The intellectual basis of family medicine revisited. *Fam Med* 1985; 17:219-30.
24. Starfield B. Primary care: concept, evaluation, and policy. New York, NY: Oxford University Press, 1992.
25. Donaldson M, Yordy K, Vanselow N, eds. Defining primary care: an interim report. Washington, DC: National Academy Press, 1994.
26. Pommerenke FA, Dietrich A. Improving and maintaining preventive services. Part I: applying the patient model. Part 2: practical principles for primary care. *J Fam Pract* 1992; 34:86-98.
27. Jaén CR, Stange KC, Nutting P. The competing demands of primary care: a model for the delivery of clinical preventive service. *J Fam Pract* 1994; 38:166-71.
28. Iverson DC, Cologne BN, Miller RS, Niebauer LJ, Reed FM. The development and management of a primary care research network, 1978-1987. *Fam Med* 1988; 20:177-80.
29. Green LA. How can family practice and primary care practice-based research networks contribute to medical effectiveness research? In:

- Hibbard H, Nutting PA, Grady ML, eds. Primary care research: theory and methods. AHCPR conference proceedings. Rockville, Md: Agency for Health Care Policy and Research, publication No. 91-001, 1991.
30. Nutting PA. Practice-based research: laboratories for outcomes and effectiveness research. In: Hibbard H, Nutting PA, Grady ML, eds. Primary care research: theory and methods. AHCPR conference proceedings. Rockville, Md: Agency for Health Care Policy and Research, publication No. 91-001, 1991.
 31. From BS, Snyder VL. Research design and statistical procedures used in *The Journal of Family Practice*. *J Fam Pract* 1986; 23: 564-6.
 32. Muncie HL Jr, Sobal J, DeForge BR. NAPCRG abstracts 1977-1987: analysis of research designs and methods. *Fam Med* 1990; 22:125-9.
 33. Cebul RD. Firm systems. In: Hibbard H, Nutting PA, Grady ML, eds. Primary care research: theory and methods. AHCPR conference proceedings. Rockville, Md: Agency for Health Care Policy and Research, publication No. 91-001, 1991.
 34. Stange KC, Zyzanski SJ. Integrating quantitative and qualitative research methods. *Fam Med* 1989; 21:448-51.
 35. Callahan EJ, Bertakis KD. Development and validation of the Davis Observation Code. *Fam Med* 1991; 23:19-24.
 36. Stange KC, Miller WL, Crabtree BF, O'Connor PJ, Zyzanski SJ. Multimethod research: approaches for integrating qualitative and quantitative methods. *J Gen Intern Med* 1994; 9:278-82.
 37. Crabtree BF, Miller WL, Addison RB, Gilchrist VJ, Kuzel A. Exploring collaborative research in primary care. Thousand Oaks, Calif: Sage Publications, 1994.
 38. Sandy LG, Foster NE, Eisenberg JM. Challenges to generalism: views from the delivery system. *Acad Med* 1995; 70:S44-6.
 39. Greenlick MR, Freeborn DK, Pope CR. Health care research in an HMO: two decades of discovery. Baltimore, Md: The Johns Hopkins University Press, 1988.
 40. Bailit H, Federico J, McGivney W. Use of outcomes studies by a managed care organization: valuing measured treatment effects. *Med Care* 1995; 33:AS216-25.
 41. Rosenblatt RA. Confronting the millennium: family medicine in the late 20th century. *Fam Med* 1990; 22:46-51.
 42. Mayfield J, Grady ML, eds. Conference proceedings: primary care research: an agenda for the 90s. Rockville, Md: Agency for Health Care Policy and Research, 1990.
 43. Hibbard H, Nutting PA, Grady ML, eds. Primary care research: theory and methods. AHCPR conference proceedings. Rockville, Md: Agency for Health Care Policy and Research, publication No. 91-001, 1991.
 44. Rogers J. Family medicine research: a matter of values and vision. *Fam Med* 1995; 27:180-1.
 45. Nutting PA, Green LA. Practice-based research networks: reuniting practice and research around the problems most of the people have most of the time. *J Fam Pract* 1994; 38:335-6.
 46. Glantz SA, Bero LA. Inappropriate and appropriate selection of 'peers' in grant review. *JAMA* 1994; 272:114-6.
 47. Thompson RS, Taplin SH, McAfee TA, Mandelson MT, Smith AE. Primary and secondary prevention services in clinical practice. Twenty years' experience in development, implementation and evaluation. *JAMA* 1995; 273:1130-5.
 48. Eisenberg JM. Cultivating a new field: development of a research program in general internal medicine. *J Gen Intern Med* 1985; 1:S8-18.
 49. Bland CJ, Schmitz CJ. Characteristics of the successful research and implications for faculty development. *J Med Educ* 1986; 61:22-31.
 50. Hitchcock MA, Bland CJ, Hekelman FP, Blumenthal MG. Professional networks: the influence of colleagues on the academic success of faculty. *Acad Med* 1996. In press.
 51. Mills OF, Zyzanski SJ, Flocke S. Indicators of research productivity in family medicine residencies. *Fam Med* 1995; 27:188-93.
 52. Kahn RC. Picking a research problem. The critical decision. *N Engl J Med* 1994; 330:1530-3.
 53. Covey S. *The seven habits of highly effective people*. New York, NY: Simon & Schuster, 1989.
 54. Hekelman FP, Gilchrist V, Zyzanski SJ, Glover P, Olness K. An educational intervention to increase faculty publication productivity. *Fam Med* 1995; 27:255-9.