Retailing Research: Increasing the Role of Evidence in Clinical Services for Childbirth

JONATHAN LOMAS

McMaster University, Canada

THROUGH WHAT ROUTES IS INFORMATION, AND ITS implications, transmitted from the biomedical research community to the practitioners who deliver clinical services? Once transmitted, what mechanisms determine whether the information alters behavior? My purpose here is to explore the bridges and barriers across the two "cultures" of researchers and practitioners, and to examine the behaviors of relevant groups (Greer 1988). Rather than presenting an abstract discussion of these topics, I use the text of *Effective Care in Pregnancy and Childbirth (ECPC)* as a case study to explore the general issues and to propose specific actions. ECPC was designed explicitly to act as a cultural bridge.

First, however, I review current knowledge about the transfer of information from research producers to its potential consumers—that is, the "marketplace" for clinically relevant research information—and discuss the political climate for it. I then describe the marketplace structure for obstetric care in Canada, followed by a review of the potential producers and consumers, with a particular focus on retailers of research information in Canada and a brief account of their recent relevant activities within the Canadian structure. I report the results of a survey of the attitudes, expectations, and actions of Canadians who have a stake in research transfer about obstetric care in general and ECPC in particular.

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Finally, I outline some implications of this marketplace analysis and recommend actions to increase practitioners' use of appropriate research information.

From Diffusion to Dissemination to Implementation

A review of the evolution of structures for research transfer in clinical care yields two distinct phases, with a third glimmering on the horizon. Initially, the predominant model was one of passive diffusion, with a long history of, and overriding respect for, practitioner independence. A dissemination model, in which synthesized information is actively broadcast to practitioners, has recently emerged. Finally, a third model—coordinated implementation—is beginning to focus on the need not only to broadcast, but also to monitor and encourage local application of the synthesized information.

Passive Diffusion

Passive diffusion models guided the design of research transfer structures until recently. Information generated by researchers was published, perhaps becoming part of continuing medical education (CME) or other informational formats, and possibly being adopted if it came to a practitioner's attention. The process was akin to uncoordinated osmotic transfer.

Figure 1 outlines this diffusion model, highlighting three of its assumptions: that practitioners actively seek out research information, that they can select and appraise the information appropriately, and that they make research-driven probabilistic patient care decisions. These three assumptions have been seriously undermined over the last few years by evaluative studies demonstrating that practitioners prefer summaries to original research studies (Winkler et al. 1989), that only 30 percent of practitioners even examine (never mind critically appraise) the methods used in the research studies they do read (Williamson et al. 1989), and that actual practice often deviates significantly from what the research evidence implies (Eddy 1982). The conclusion is inescapable: practitioners' behavior is only loosely connected to formally published research studies (Haynes 1990).

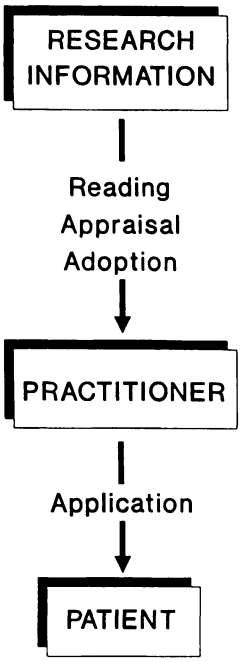

FIG. 1. The passive diffusion model.

Active Dissemination

Three factors have led to the diffusion model's rapid replacement by the dissemination model: the diffusion model's assumptions are clearly untenable; the overwhelming volume of research information cries out for synthesis; and the growing cost of health care means that, in order to meet greater demands for accountability, practitioners (or, rather, their representative organizations) need good-quality research information.

Figure 2 illustrates the active dissemination model. This is an improvement over the passive diffusion model because, through synthesis and distillation, it makes research more accessible; its appeal is potentially targeted to practitioners via a respected and relevant authority. Two of the model's assumptions, however, are that acquiring information leads to behavioral change and that clinical decisions are made in isolation from the overall practice environment. The change in approach signaled by this model is a recognition that neither the producers of research information nor its potential consumers are able to communicate

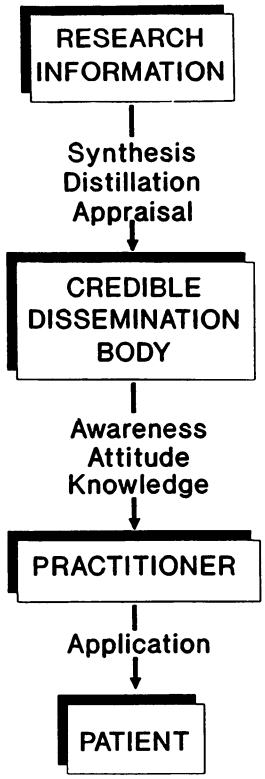

FIG. 2. The active dissemination model.

in a common language. Thus, a role has emerged in the information marketplace for "retailers": organizations and ad hoc groups that ideally are credible to both producers and consumers and are able to accurately synthesize and disseminate the research information, and its implications for clinical practice, in formats such as practice guidelines. ECPC was a project, and comprised a set of technologies, that flowed directly from this perceived need for retailers in the information marketplace.

However, ECPC (and practice guidelines generally) focuses on providing information, albeit more efficiently. Whereas the diffusion model left the consumer to sort the wheat from the chaff, the relevant from the irrelevant, or the proven from the promising, the dissemination model presorts the information, formats it in a user-friendly way, and tries to distinguish it from the crowd. This effort apparently informs a larger

proportion of clinical practitioners about the relevant research and disposes them more positively toward it (Lomas et al. 1989).

Critically important to the model, however, would be a demonstration that channeling information more efficiently does, in fact, lead to desired changes in practitioner behavior. The evidence suggests that this does not happen. Few, if any, evaluations of the impact of practice guidelines have shown a significant increase in research-driven practice (see Lomas 1991, 56–60, for a review of evaluations). This does not, however, appear to have dampened the enthusiasm of most promulgators of practice guidelines; for instance, at last count, the American Medical Association (AMA) had listed over 1,200 practice guidelines, and the list is growing at a rate of more than 300 per year (American Medical Association 1991).

This lack of behavioral impact is not, of itself, inappropriate. The overall validity of the synthesis or its applicability to a particular local environment may be in question. Practitioners may absorb the information, but choose not to apply it because they judge it will not improve patient outcomes. Indeed, in the face of the explosion in available practice guidelines, much effort is now going into methods to assure and/or assess the validity of research syntheses (e.g., Oxman and Guyatt 1988). However, based on the assumption (as the remainder of this article is) that the problem of assured validity has been solved for a particular synthesis, products like ECPC appear to be a necessary, but not sufficient, condition for improved transfer of research to frontline practitioners. This raises the question of what conditions *are* sufficient.

Coordinated Implementation

The answer to the question of sufficient conditions promises to be the third, largely unexplored, phase in the structure of clinically relevant research transfer. As in the marketing of any product, it involves careful evaluation of what drives the potential consumer's behavior. The passive diffusion model assumed either a direct link between researchers and practitioners, or, in the marketplace analogy, that nothing more was needed than production-line workers at a car factory and citizens who wanted to purchase cars. Active dissemination implies, at least, that the information provided by the technical producers about the research (or the car) must be made more accessible to potential buyers. The final step

recognizes that even synthesized and accessible information is not the only source of guidance for a potential (clinical or car-buying) consumer and that competition from other sources of information requires the synthesis to be actively retailed.

The diffusion, and now the dissemination, models are, however, only designed to transfer information into the practitioner's environment through education. In fact, any practitioner exists within an environment, nationally and especially locally, that has a number of competing influences, each clamoring to have an impact on his or her ultimate behavior. No retailer of research information is more aware of this than the pharmaceutical manufacturer (Avorn, Chen, and Hartley 1982).

Figure 3 moves inside this "black box" of the overall practice environment to capture schematically these competing routes of influence. It demonstrates some of the additional, and as yet largely unexploited, routes through which research information could influence clinical practice (Stocking 1985; Eisenberg 1986; Schroeder 1987; Lomas and Haynes 1988; Fox, Mazmanian, and Putnam 1989; Stafford 1990). The synthesized information can influence the practitioner by contributing beyond his or her traditional and formal educational environment (the "shadow" boxes in figure 3). Informal education, resulting from day-to-day contacts with colleagues and influentials, can be driven by the synthesis. Administrations can alter regulations, for example, by creating reminder systems or peer review, to reflect the research synthesis. Incentives in the economic environment, such as the relative value of medical fees, can reflect what a credible dissemination body deems to be a valid research-based guideline. Use of the media and other public education mechanisms can generate both communitywide and patient pressure for a practitioner to incorporate research findings into local practice. Finally, a factor that is largely outside the control of implementation agents is personal circumstance—the state of the practitioner's marital relations, personal mental health, and so on—which will affect his or her receptivity to any of these influences. Similarly, the susceptibility of various environments to research influence will be affected by uncontrollable external factors, like technologic capability or overall economic circumstances.

The conclusion is that the research information not only must be disseminated in synthesized form, but also that it must be carefully embedded in multiple routes of influence in order to pressure practitioners into applying it to patient care. This requires dissemination agents, however,

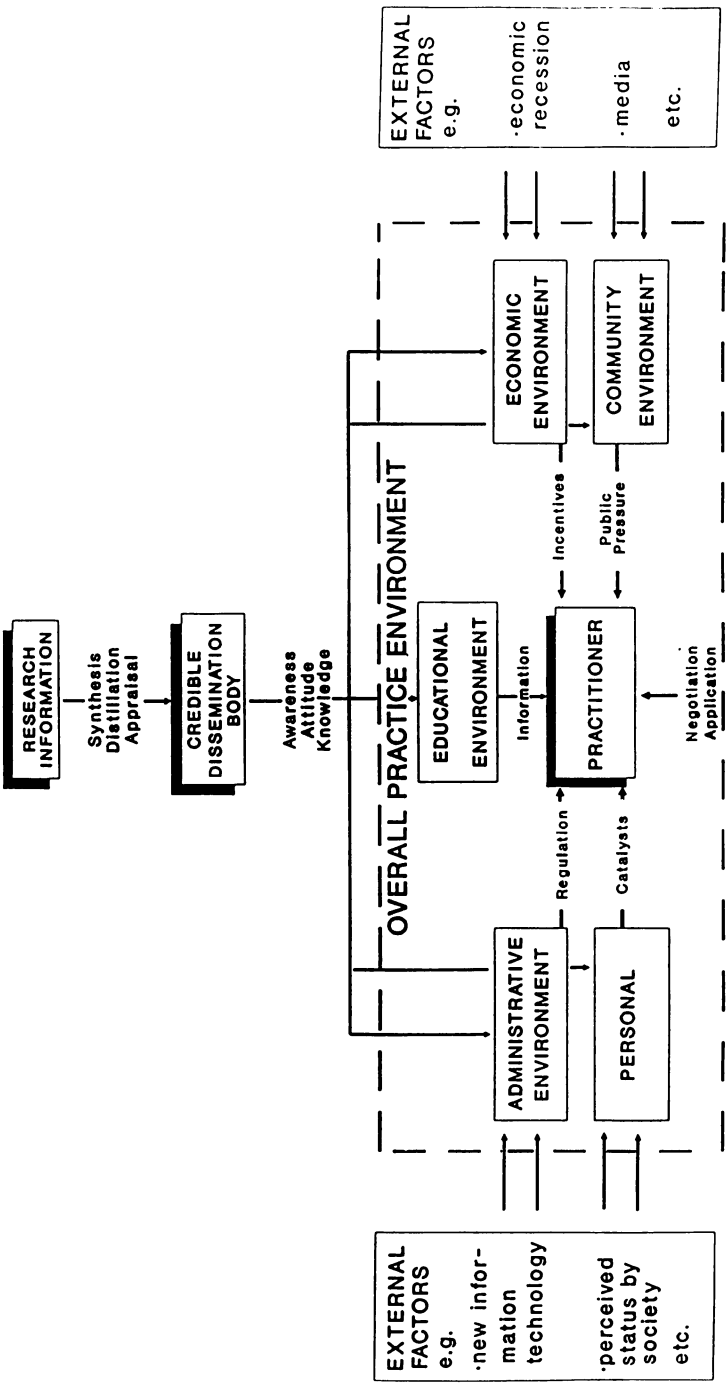

FIG. 3. The coordinated implementation model.

to improve their understanding of influences on practitioner behavior, and to become more willing to exploit those influences over which potentially they have some control (Dixon 1990; Epstein 1991). This, of course, brings us up hard against the reality of accepted definitions of a "professional," that is, independently skilled and autonomous individuals with the right to make their own decisions (Lomas 1990a). This conflict becomes only slightly eased when we are faced with the evidence that professional autonomy is unthinkingly abused as often as it is appropriately applied.

What influences in the average practitioner's environment require further elucidation if they are to be incorporated into a coordinated implementation model of research transfer? Most directly, the patient, as represented both individually and by the various community groups interested in clinical care, can strongly influence decisions. The lay public particularly has used its attitudes and knowledge to influence obstetric care, sometimes by opposing the move to high technology and occasionally by altering direction through organized activities (Shearer 1989). The administrator, with the capacity to make institutional rules, to deny or provide particular technologies, and to use or neglect specific data, is also potentially influential. The public policy maker or, in the United States, the private insurer, wields the extensive power of economic incentives. Finally, clinical policy makers, represented by medical associations, specialty groupings, disciplinary bodies, or, perhaps most influentially, local colleagues, exercise peer pressure as well as directive power, in addition to their traditional educational role.

Thus, approaches to research transfer must take account of the views, activities, and available implementation instruments of at least these four potential retailers in the information marketplace: community interest groups, administrators, public policy makers, and clinical policy makers. The tools of influence are, in each case, quite different (public pressure, regulation, economic incentives, and education, including social influence from colleagues), but, when working together, the sum of their effects is greater than their parts.

Analyzing past efforts at reducing the cesarean section rate in the United States, Stafford succinctly summarizes this evolution from passive diffusion to coordinated implementation models of research transfer:

> Early approaches stressed relatively passive strategies that preserved physician autonomy and were relatively easy to implement. The apparent failure of these approaches has led to an escalation in the intru-

> siveness of strategies. Obstetricians have been called on to solve the problem themselves, but . . . past research has identified a broad range of factors that affect medical decision making . . . and . . . future efforts must account for these multiple influences on medical decision making. (1990, 683)

I will adopt this view of coordinated implementation, as it applies to the clinical care delivered during childbirth, when considering the four "nonpersonal" routes of influence in figure 3. I will explore the current preparedness of the various childbirth education and interest groups, the administrators of institutions and institutional networks for childbirth, the national and provincial policy makers for maternal and child health, and the obstetric provider organizations that disseminate information such as ECPC. First, however, I will briefly describe the structure of clinical care for childbirth in Canada.

The Structure of the Childbirth Information Marketplace in Canada

Health Care Delivery and Childbirth in Canada

National health insurance in Canada comprises 12 health care systems (ten provinces and two territories), each operating under the same basic principles—universal, comprehensive, and portable coverage; public administration (which goes so far as to exclude private insurance for publicly insured services); and funding by various tax, premium, and/or payroll revenues with no point-of-service charges to patients. Variations in the organization of care are not large, but they do exist within this set of federally imposed principles.

Nearly all hospitals are not-for-profit organizations run by autonomous boards, but they receive the majority of their funding from a provincial or territorial government. Physicians are largely self-employed, private practitioners who receive most of their fees from provincial or territorial public health insurance agencies. The situation, until recently, was therefore best described as public funding for private delivery of health care. Although this description is still accurate, provincial governments are moving toward establishing greater fiscal, but not clinical, ac-

countability for hospitals and physicians. Clinical decisions remain in the domain of the practitioners and their representative organizations. Fiscal accountability continues to be directly to provincial governments, but current debate has focused on the possibility of decentralizing planning and fiscal authority to local regions within the provinces (e.g., Royal Commission on Health Care 1989, 1991; Premier's Council of Health Strategies 1991).

The effective exclusion of midwifery in the twentieth century, and the initiation of hospital insurance more than ten years before health insurance, partly explains Canada's almost total reliance on physician-attended, hospital-centered childbirth. It was not until the 1990s that the publicly funded birthing centers and the provincially approved midwifery programs first came into being; these options still account for no more than 5 percent of childbirths in Canada.

Therefore, the majority of pregnant Canadians obtain all their care from a physician and deliver their babies in a hospital. Antenatal care is split between general practitioners (GPs) and obstetricians; fewer than one-third of childbirths, however, are attended by GPs (Klein and Zander 1989). An increasing concern in Canada is the exodus of GPs from obstetric care in general, and attendance at childbirth in particular (Ontario Ministry of Health 1991). Obstetricians trained for high-risk childbirths object to the increasing proportion of low-risk deliveries in their practices. In this climate, the concept of midwife has become more popular, with support not only from the public, but also from obstetricians and GPs. Popularity has not yet translated into significant presence, although the largest province—Ontario—has recently "legalized" midwifery, and is just setting up its first training programs.

The Potential Retailers of Childbirth-related Research

From the perspective of the information marketplace, this configuration of delivery arrangements offers the potential for coordinated research transfer, not only by isolating physicians as the clear targets of the transfer—the main consumers—but also by identifying the potential retailing agents for valid syntheses of research information. Public policy making is centralized in the provincial governments, relevant clinical policy making can be isolated within physician (and, in the future, midwife or

nurse) provider groups, and administrative policy concerns may be addressed by hospitals.

However, childbirth issues have attracted a heterogeneous array of community groups, some of which provide direct service in the form of prenatal classes (the Childbirth Education Association) or breast-feeding support (La Leche League), others of which have adopted a combined information and lobbying function (e.g., Vaginal Birth after Cesarean). The recent development of midwifery as a matter of public policy concern has also sparked the organization of some community groups (Task Force on the Implementation of Midwifery in Ontario 1987).

The potentially coordinated picture for research transfer is further disrupted because most public or administrative policy makers do not see themselves as retailing agents for relevant childbirth research. Provincial governments still labor under the burden of an implicit compact arrived at with physicians at the inception of national health insurance: the government pays the bills and clinicians practice medicine (Naylor 1986). Even under intense public pressure for action on childbirth issues, such as rates of cesarean section that are unsupported by available research, provincial governments have resorted to task forces or committees that give significant say over resolution to the physician community, and have avoided the use of any economic disincentives (e.g., Committee of Inquiry into Cesarean Section Rates in Nova Scotia 1990; Ontario Ministry of Health 1991).

The potential administrative policy makers are both organizationally and legislatively poorly defined: within hospitals, the administrators share an ambiguous handle on power with physicians; outside of hospitals, there are no clear lines of responsibility for administrative control until one reaches the provincial government (Lomas 1990b). There are no regional health authorities like those in Britain, and no "managed care" such as exists in health maintenance organizations or under private insurance plans in the United States.

Consequently, physician organizations have, in practice, been the only major retailers of research information. In addition to the medical schools, these organizations are of three types: first, and most influential, are the national specialty groupings. The Society of Obstetricians and Gynaecologists of Canada (SOGC) communicates with both specialists and GPs involved in childbirth via a journal and various educational meetings. It has, for at least the past ten years, engaged in active dissem-

ination by synthesizing and publishing guidelines and recommendations for practice based on its interpretation of the research evidence. The College of Family Physicians has its own journal, organizes continuing medical education, and undertakes prospective peer review for quality assurance. It has been less concerned than the specialty society with active dissemination.

Second, the medical associations in each province nearly all have obstetrics and general practice sections. They also offer educational events and ad hoc publications, but less systematically and under a passive diffusion model that assures the autonomy of its individual members. For instance, practice guidelines are tolerated only as long as they stop short of actually prescribing specific clinical actions (Linton and Peachey 1990).

Third, the licensing and disciplinary bodies ("colleges") in each province primarily restrict themselves to the traditional policing role (Fooks, Rachlis, and Kushner 1990). Recently, some have adopted a more active approach to a quality assurance mandate. In Ontario, for example, the college has developed practice guidelines as part of its legislative responsibility for monitoring and assuring quality in the newly established independent health facilities (IHFs) (Gold 1990). Organized at the moment primarily for elective surgery and diagnostic services, IHFs could become the umbrella for birthing centers in the event that the centers evolve from their current hospital sponsorship.

One other provider organization can act as a retailer of research information, although it does not see itself in that light. The Canadian Medical Protective Association is the self-insurance mechanism used by physicians for malpractice claims. Besides collecting dues and organizing the defense of physicians who have been sued for malpractice, it sends out periodic bulletins to guide appropriate practice. These bulletins will often include case examples with commentary and, anecdotally, are reported to exert considerable influence on the practices adopted by physicians (Prichard 1990).

Therefore, the potential retailers of childbirth-related research information in Canada, by virtue of our health care system's structure and by convention, have been restricted mostly to provider organizations operating under a passive diffusion model. Nevertheless, some groups, most notably the specialty society SOGC, have adopted an active dissemination approach, whereas others, like the colleges, are contemplating active roles in quality assurance. Governments have largely avoided using

any of their economic leverage as a tool for research transfer. They have, however, been gently pushing the various provider groups toward the use of practice guidelines and responding to pressure from community groups, especially on high cesarean-section rates, by providing forums to air the issues. After obtaining a profile on C-section rates, the community groups have been increasing the pressure; they have achieved significant success in the implementation of midwifery. The limited power of administrators in hospitals and their ill-defined authority at the regional level will remain unchanged until the planned decentralization of funding and authority occurs.

Although most of these changes are expanding the potential scope of research information retailed to providers, it is not clear whether everyone understands or desires this. To answer the question of what role the various groups perceive for themselves and for others in research transfer, we surveyed the relevant national and provincial organizations. We focused on the awareness of, attitudes toward, and actions planned for ECPC, and for more generally available practice guidelines or other research syntheses.

The Attitudes and Approaches of Childbirth-related Organizations

The Survey's Methods

The survey was conducted in the fall of 1991, more than two years after the release of ECPC, and it focused on both ECPC *and* research syntheses such as practice guidelines. We concentrated on organizations, rather than on individuals, because we assumed that only they had sufficient resources and structures to engage in planned research transfer activities. Interviewees were encouraged to speak on behalf of their organizations. If they felt unable to do this, they were allowed to respond as individuals who, we felt, represented at least an influential voice within the organization. The survey instrument was mailed to respondents prior to a telephone interview.

The selected organizations represent the four potential retailing groups for synthesized research information: public policy makers, administrative policy makers, clinical policy makers, and community groups. We interviewed organization representatives at the national level

and in the three provinces of Nova Scotia (a small eastern province), Ontario (the largest and a central province), and British Columbia (a medium-sized western province).

Forty-eight organizations were approached and 38 provided an interview (see table 1), for a response rate of 79 percent. Notably, seven of the ten nonresponders were physician organizations in the clinical policy category. To reach public policy makers, we targeted Ministry of Health civil servants responsible for maternal and child health and, in the case of the provinces, appropriate medical consultants responsible for claims assessment in the ministries' health insurance branch. To contact administrators, we targeted the hospital associations, public health associations (which have a role in pre- and postnatal care in some provinces), and the parent organizations of any regional planning bodies. To interview clinical policy makers, we obtained a response from most of the chapters of SOGC, and from the provincial medical schools' obstetric residency programs in each geographic location. In addition, we had responses from various medical associations and from some of the Colleges of Physicians and Surgeons. Finally, we identified the national and provincial Childbirth Education Associations, the provincial Vaginal Birth after Cesarean groups, and any other community-based groups that focused on childbirth, such as the National Institute of Child Health.

The interview used a structured protocol to assess the following aspects of the organizations:

TABLE 1
Numbers and Categories of Organizations Surveyed Nationally and in Three Provinces

	Geographic area				
Organization	Canada	Nova Scotia	Ontario	British Columbia	Total
Public policy makers	1	2	2	1	6
Administrators	2	2	3	3	10
Clinical policy makers	2	3	4	2	11
Community groups	4	2	3	2	11
Total	9	9	12	8	38

- awareness of and attitudes toward ECPC
- actual and planned activities to disseminate and encourage action based on ECPC or any currently available practice guidelines
- potential ability to undertake activities to disseminate and encourage action based on ECPC or other important new clinical information
- desire and ideas for undertaking research transfer
- perception of barriers to effective research transfer
- perception of other organizations' roles in research transfer

Summary of Results

The larger provinces revealed a slightly higher degree of awareness and general knowledge about the concept of research syntheses and the specifics of ECPC. Otherwise, geographic differences were not large. Therefore, we will describe differences among types of organization.

Awareness of and Attitude toward ECPC. Fifty-three percent of responding organizations had heard of ECPC. Only one-third of public and administrative policy-maker organizations, but two-thirds of the clinical policy-maker and community groups, were aware of the text.

Nearly all responders appreciated that the principle of critically appraised evidence upon which ECPC is based differentiates it from the usual medical textbook approach. A representative response was, "Other textbooks don't present the different research findings to back up their facts." However, only the clinical policy organizations, and occasionally the community groups, were confident about their ability to discriminate between methodologically sound and poor research. The administrator and public policy organizations tended to assign responsibility for such critical appraisal to clinical practitioners and their organizations. One administrator stated, "We do not assess validity or effectiveness; we assess whether a health program is needed in the community."

Actual or Planned Research Transfer Activities. There were virtually no actual, or even planned, activities to coordinate the active implementation of the recommendations either from ECPC or from other practice guidelines and research syntheses. Only three initiatives using active implementation techniques were uncovered. One uses hospital-based opinion leaders; another, nursing visits; and the third has designed a quality assurance program based on specific practice guidelines. Two, however,

are research studies. In the opinion-leader initiative, ECPC's recommendations are part of a program to encourage evidence-based practice by *nurses* in hospital labor and delivery suites. The other research study is part of the new legislative mandate to one of the colleges to assure quality in IHFs. Although the organization was not aware of ECPC, the study focuses on monitoring and encouraging compliance with practice "parameters" developed specifically for IHFs by a number of ad hoc specialty panels, one of which was in obstetrics.

Thus, nearly all research transfer initiatives by the organizations were diffusion or dissemination activities. Just as the clinical and community organizations had been more aware of ECPC, so too they were more likely than public policy or administrator organizations to be engaged in or planning to disseminate research findings. One of the six public policy and three of the ten administrator organizations reported no actual or planned activity in this area. Some of these two types of organizations actively excluded such activities from their mandate: "We, as an organization, should not be involved in any type of research dissemination. It is our role to make sure procedures are medically necessary." Except for some of the community groups, no organization had diffusion or dissemination activities designed specifically around ECPC, or even activities that clearly separated methodologically sound research studies and syntheses from other research. A number of the community groups, however, were extremely enthusiastic about ECPC and used it as the basis of much of their communication work both with other women and with nurses and physicians.

Table 2 outlines the nature of the reported research transfer activities, by type of organization, on the basis of responses to the questions concerning actual or planned activities "to bring clinically relevant research information to the attention of your members and encourage its use in the care of pregnant women." Table 2 presents the percentage of organizations reporting activities that fall into the "passive diffusion" or "active dissemination" categories of activity. The majority of the initiatives are in the passive diffusion category. For instance, 33 percent of public policy organizations were sending out newsletters, journals, or other publications containing relevant research information, but no more than 17 percent were performing any other type of research transfer activity. Across all the organizations (the last column of table 2), only 26 percent of the total activities could even be considered active dissemination; three-quarters of the initiatives take the passive diffusion approach.

TABLE 2
Actual or Planned Activities to Bring Relevant Research to the Attention of the Organization's Audience and to Encourage its Use in the Care of Pregnant Women

Actual or planned activity	Organizations undertaking or planning the activity[a]				
	Public policy makers	Administrators	Clinical policy makers	Community groups	Percentage of total activities[b]
No activity (no. of organizations)	1	3	2	1	
Passive diffusion (%)					
Newsletter/journals/ other publications	33	50	18	73	34
Continuing medical education or conferences	17	20	45	64	30
Resource centers for consumers	0	20	9	18	10
Active dissemination (%)					
Topic-specific meetings/ task forces	17	20	55	9	20
Clinical chart reviews	0	10	0	0	2
Advertising in journals	17	10	0	0	4

[a] Percentages use the number of organizations in that organization type as the denominator.
[b] Percentages use the total number of all types of activities by all types of organizations as the denominator.

Desired Research Transfer Activities. Responding organizations were also encouraged to take a "flight of fancy" by outlining the research transfer activities they would like to see initiated by themselves, or by other organizations, if there were no financial or other barriers. Respondents appeared to have thought little about this issue—a message in itself—and the activities they proposed strikingly resembled the ones that were planned or already in place (see table 3). Seventy-one percent of the proposed activities would still be based on passive diffusion, but with an increased focus on CME and conferences. They expressed slightly more interest in media and journal advertising, suggested various ways to use practice guidelines, and referred to the emerging concepts of in-

TABLE 3
Suggestions of Activities to Bring Relevant Research to the Attention of the Organization's Audience and to Encourage Its Use in the Care of Pregnant Women if No Barriers or Constraints Existed

Suggested activity	Percentage of the organizations suggesting the activity[a]				Percentage of total activities[b]
	Public policy makers	Administrators	Clinical policy makers	Community groups	
Passive diffusion					
Newsletter/journals/ other publications	0	30	0	9	10
Continuing medical education or conferences	17	50	36	45	35
Resource centers for consumers	0	10	9	36	14
Networking/intergroup cooperation	17	20	0	18	12
Active dissemination					
Topic-specific meetings/ task forces	0	0	0	0	0
Clinical chart reviews	0	0	0	0	0
Advertising in journals or media	0	10	9	18	10
Set guidelines	0	0	18	9	7
Recertification/licensing of physicians	0	20	9	18	12

[a] Percentages use the number of organizations in that organization type as the denominator.
[b] Percentages use the total number of all types of activities by all types of organizations as the denominator.

terorganizational cooperation and networking, as well as the use of research findings in the process of physician recertification or licensing. No organizations suggested applying the research information to clinical chart audits or reviews or instituting administrative rules based on the research findings; even the public policy organizations did not suggest using economic incentives.

Perceived Roles in Research Transfer. Many organizations had to be probed for specific answers to questions on who they thought *should* have a role in disseminating and implementating research information. Even then, 18 percent had no specific organization in mind. This clearly was a topic that most organizations had spent little time contemplating. Of most interest was how often an organization type was perceived by others to have a role in implementating research, and how often this organization type perceived a role for itself. Summarizing these responses, it appears that

- clinical policy groups are most likely to be perceived and most likely to want to play a role in research transfer
- although community groups have little support from others, they perceive themselves as playing an important role
- there is no strong perception either by others or by themselves for a role by public policy makers or administrators.

One of the clinical policy organizations stated, "In an ideal setting important new information would be made quickly available to all staff and a mechanism, such as the Medical Advisory Committee, would be empowered to implement changes in policy based upon this information." Contrast this with the response of one public policy-maker organization that clearly drew the line at active implementation: "Distribution of information to the public and health care professionals is fine. Anything more is not the role of the government. . . . [L]egislation is up to physicians' organizations."

Barriers to Research Transfer. The last response area concerned barriers to implementing research findings. All organizations most often cited physicians' attitudes and approaches, especially their failure to "keep up with the literature." Lack of resources and absence of appreciation for research information were also seen as major obstructions, particularly by community and clinical policy groups.

Conclusions from the Survey

Overall, these results do not present an encouraging picture. With the exception of community groups, a high degree of either complacency or neglect characterizes the surveyed organizations. Most organizations see

incorporation of research information into clinical practice as the responsibility of individual physicians or physician organizations and are hardly aware that most physicians do not routinely change behavior in response to research.

Most research transfer continues to operate under a passive diffusion model. To the extent that an active role is perceived as necessary, it falls to the provider groups, and is seen primarily in terms of information transfer, not behavior change. Even the community groups assume behavior change will result from better provision of information, rather than from "retailing" the information through multiple routes of influence in the practitioner's environment.

The muted role of administrator and public policy-maker organizations, almost predetermined by the structure of the Canadian health care system, was confirmed by these organizations' responses to the survey questions. Few individuals who worked for them were informed about clinical care in general or obstetrics in particular. Indeed, in the survey, we often talked to individuals who initially resisted our interview because they did not perceive themselves as well enough informed, despite the fact that they knew more than anyone else in their organization about clinical effectiveness or obstetric issues. The self-defined role of governments and administrators in research transfer appears to be expanding slowly, but intrusive measures, like direct economic incentives, still are not planned.

Perhaps the survey's most encouraging results can be found in the expressed willingness of some clinical policy organizations to participate more actively in dissemination (e.g., recertification or licensure processes that relate practice to the appraised research), and in the enthusiasm and sense of empowerment described by the community groups that were aware of ECPC.

A Coordinated Implementation Plan

The following plan to actively implement ECPC is premised on three interacting phases: First, identification of "product champions" to retail the clinical implications of ECPC within each of the four potential groups surveyed above. Second, preparation of situational analyses for these product champions to spark ideas and encourage action. Finally,

establishment of annual conferences of the product champions for joint planning and ongoing monitoring of activities.

Product Champions

ECPC is not the first attempt at synthesized, methodologically sound research on practices and procedures for childbirth. The unique contribution of ECPC is, rather, its comprehensiveness: a summary of all relevant research for clinical care surrounding and during childbirth is contained between four hard covers, two paperback covers, or on a diskette. Its value, therefore, is that champions of effective research transfer need not undertake extensive search and collation activities themselves. To the extent that there is controversy about ECPC's single-minded reliance on meta-analysis for clinical advice (Mann 1990), the champions may need to supplement the work within their organizations in order to derive contextually sensitive recommendations. It is easy enough, however, for consensus panels or task forces to tailor ECPC's implications to the context and nature of the membership's type of involvement in childbirth (Lomas 1991). ECPC becomes, then, a practical, rather than a conceptual, tool for research transfer.

Nevertheless, the results of the survey demonstrate that, with the exception of community groups, this potential has been neither realized nor exploited in the information marketplace for childbirth services in Canada. Only one-third of public policy-maker or administrator organizations had even heard of ECPC, and nearly all failed to see that it provided them with a new tool to appraise the obstetric practices that they managed and/or funded. Clinical policy organizations were treating ECPC as if it were no different from any other research information.

By contrast, the two-thirds of community organizations acquainted with ECPC were acting as product champions (Rogers 1983), promoting its use with their members and using it to empower their dealings with hospitals, physicians, and nurses. The one-third of these organizations that learned of ECPC through the survey were quick to see its potential value, and may well be exploiting that potential by now. Any coordinated implementation plan must, therefore, find product champions inside each of the four potential research-retailing organizations. These champions are in a better position than anyone outside the organization to understand the constraints on, and opportunities for, the use of ECPC

as an educational, administrative, economic, or community tool for flooding the practitioners' environment with the implications of relevant research.

Establishing Potentially Motivated Retailing Organizations

The retailing of ECPC through these various routes of influence will be most efficient if the effort of identifying and equipping product champions is directed to the most receptive organizations. At the same time, the efforts should not ignore the potential to have all four routes of influence operating where possible. Thus, the weight of effort should be directed toward community groups and clinical policy makers, but receptive public policy makers and administrators should not be excluded. Finally, efforts to coordinate the approaches of all the organizations will offer a further strategic consideration.

Selection of specific organizations as potentially successful implementation partners requires at least four considerations. The organization should

1. have an appreciation for "classes of evidence" and the importance of research in determining clinical practice
2. perceive that there is a problem in the reflection of research evidence in clinical practices for childbirth
3. perceive themselves as having a role in minimizing this problem
4. have structures and mechanisms in place that they are willing to use to influence practitioners

A first step in motivating potential partners is, therefore, to prepare a situational analysis for each organization: for example, a justification for improving the quality of obstetric care and identification of the organization's particular possible approach to the task. Many of the data for this situational analysis are available from the survey I have described. A brief orientation document for each organization could introduce ECPC by outlining the concept of "classes of evidence" and illustrating it with selected and striking examples of deviations of practice from evidence. This component of the analysis would be the same for each organization; it would then diverge to specifics by describing the organization's particular potential for addressing the problem, and by illustrating how it

could use its existing structures and mechanisms to increase the proportion of evidence-based clinical practice for childbirth.

The situational analysis also offers the opportunity for an organization to be apprised of how others view it as a research transfer agency. One of the ironies of the survey results is that the community groups were pushing hard for interorganizational cooperation, yet few other groups (especially clinical policy organizations) saw any role for community groups as part of such a cooperating network for research transfer.

This situational analysis is the basis for approaching those individuals within the relevant organization who are most likely to be effective product champions. Situational analyses will also reveal the most promising organizations—probably clinical or community groups—and these should initially receive the most attention. Presentation of the analysis is the first step in motivating potential retailers. The specific retailing activities will, however, flow from our existing knowledge of effective ways to change practitioner behavior and the supplementary ideas developed by the product champions and their colleagues. In the next section I will briefly review the principles for behavioral change activities, based on existing research, before outlining suggestions for activities by each of the four potential retailers.

The Principles for Retailing Activities

Changing practitioner behavior to align medical practice more closely with medical evidence is best viewed as a process rather than a single activity. The process has been well described in psychology as consisting of three stages: predisposing, enabling, and, finally, reinforcing the desired change (Green and Eriksen 1988). Predisposing activities alert practitioners to a problem and facilitate consideration of potential solutions. Enabling activities identify and remove the specific barriers—educational, administrative, economic, community-based, patient-based, or personal—to carrying out the indicated solutions. Reinforcing activities reward and maintain the changes once they are put in place.

Active dissemination approaches predispose practitioners to consider change in behavior. They are not likely to be effective at enabling change because the source of information is, like any centralized message, not designed to address the peculiarities of a local situation. Particularly powerful sanctions, such as threats from licensing or litigation

authorities (Dyck, Murphy, and Murphy 1977; Tuohy 1982), or incentives, such as economic inducements from payers (Hurley, Labelle, and Rice 1991), may constitute an exception. However, practitioners do not generally accept such sanctions or economic inducements.

One principle is that change is best enabled at the local level by focusing on the community where a practitioner's day-to-day activities occur. Recent work of sociologists (e.g. Greer 1988; Clark, Potter, and McKinlay 1991) has emphasized the overriding importance of local communication networks and influence patterns in determining clinical decision making. The four potential retailing agents of clinical policy makers, community groups, administrators, and public policy makers must not only predispose change, through largely remote educational activities, but also enable change where it is possible for them to operate at the local level.

The characteristics of effective local enabling activities have received a good deal of recent research attention. The U.S. Agency for Health Care Policy and Research (1992) has released a large bibliography, and there have been a number of reviews of potential strategies (e.g., Eisenberg 1986; Schroeder 1987; Lomas and Haynes 1988; Stafford 1990; Mittman and Siu 1992; Davis et al. 1992). The general conclusions that can be drawn from this literature are, first, that the more local and personalized the intervention, the more likely it is to be effective: "Programs are most likely to be successful if the data are individualized, if doctors are compared with their peers, and if the information is delivered personally by a physician in a position of clinical leadership" (Eisenberg 1986, 117).

Second, although there have been demonstrations of at least partially successful specific strategies such as reminder systems (Haynes and Walker 1987; Schoenbaum and Gottlieb 1990), academically based detailing (Avorn and Soumerai 1983), opinion leaders (Stross and Bole 1980; Lomas et al. 1991), audit and feedback (Eisenberg 1986), or media campaigns (Domenighetti et al. 1988), the most successful approach is likely to combine numerous strategies targeted on a single problem area. For instance, we concluded one recent review by observing that "there are many determinants of clinical action besides research evidence . . . [and] a critical review of the most rigorously evaluated [behavior change] strategies leads us to conclude that those targeting multiple determinants are most likely to be successful" (Lomas and Haynes 1988, 88).

Clinical Policy-maker Organizations

The different types of clinical policy organizations for physicians described above are specialty groupings, colleges, medical associations, medical schools, and the medical protective (malpractice) association. In addition, the emerging role of midwives will result in both a regulatory college of midwifery and a midwives' association. Finally, the nursing organizations also have a regulatory arm—the College of Nurses—and an association. Many of these organizations have both national and provincial bodies. Most often, but not always, it is the provincial bodies that are active in any research transfer.

The organization best prepared for research transfer is the Society of Obstetricians and Gynaecologists of Canada (SOGC). It sees itself reaching beyond obstetricians to family physicians and affiliated professionals. Its mission statement of June 1991 states:

> We will develop standards and guidelines of practice, educational programmes for health professionals and the public in order to enhance the health of Canadian women and their families. We will collaborate with governments and other organizations on behalf of our members so that our policies and initiatives regarding reproductive health will influence and benefit the public and other health professionals.

The outgoing president in 1991 recognized the need to do more than actively disseminate research syntheses: "Unless they're actually put into action and then monitored, the system won't work" (Murray 1991).

The fetal and maternal medicine committee of SOGC has a long history of facilitating guideline development, dissemination, and, assisted by outside researchers, implementation. The chairperson of this committee would be an ideal product champion for ECPC and for educating physicians about implementing its implications. Potential educational initiatives would be a series of articles based on ECPC in the SOGC journal, a conference dedicated to the practical implications of ECPC, the development and dissemination of a series of practice guidelines from ECPC's data, and the establishment of a provincial network of opinion leaders able and willing to engage in local implementation of ECPC (Lomas et al. 1991). Such local opinion leaders could build upon provincial and national predisposing activities by exploiting their detailed knowledge of how to apply ECPC's recommendations in local situations.

This would likely involve the (informal) coordination of both the different potential retailing agents (e.g., nurses, community groups, administrators, and physician colleagues), and their different potential activities (e.g., chart audits, one-on-one education of colleagues, media coverage of inadequacies and solutions, modifications to facilities, and so on).

Given its cooperative mandate, and its greater resources, SOGC could also play a facilitative role with the midwife and nursing organizations. Identified product champions in each provider group could join to sponsor conferences and speaker networks. Midwives also have excellent links with a number of the community groups, and could therefore act as a conduit between the physician and community organizations. Within nursing, the already active research project on implementing ECPC for labor and delivery suite nurses (also using opinion leaders) should be promoted aggressively, both within the nursing profession, as an example of what can be done, and outside the profession, to serve as a competitive catalyst to other provider organizations and geographic communities. The nursing associations could also assist with implementation. A recent survey by an arm of the Registered Nurses Association of Ontario found that 91 percent of nursing directors in health agencies desired assistance in installing programs to help nurses apply research findings to their clinical practice (Mitchell et al. 1992).

Other educational initiatives can be brought into the practitioners' environment through the more regulatory oriented colleges. At the national level, the Royal College of Physicians and Surgeons is currently investigating the most effective forms of CME for nine specialty areas, among them obstetrics and gynecology. A product champion in the Royal College could introduce ECPC as a major component of the obstetrics CME project. The Royal College also is exploring the option of recertifying physicians at periodic intervals; incorporating ECPC into the recertification process would increase its importance to the obstetric community. The use of ECPC in the initial specialty certification examinations of the Royal College could encourage medical schools at the local level to base residency training programs on ECPC. Many provincial colleges have plans for routine peer review programs. Instituting ECPC as the criterion for peer review of obstetric care would establish its importance with family physicians and obstetricians.

Finally, the power of the bulletins released by the Canadian Medical Protective Association could be harnessed to implement ECPC. This malpractice insurance body already has endorsed an obstetric practice

guideline as the standard of care in the case of litigation regarding the use of cesarean section (Canadian Medical Protective Association 1989); it could adopt ECPC as a more ubiquitous standard for childbirth clinical services. The judicious use of case examples in their bulletin, while referring to ECPC to illustrate appropriate versus inappropriate care, would bring the text to the attention of practitioners in a way that anecdotal reports indicate is one of the few powerful nonlocal determinants of clinical decision making.

Community Organizations

The two major community organizations are the international childbirth education associations and the lobbying/informational associations, the best established and most widespread of which is the Vaginal Birth after Cesarean group. Potential product champions abound within these groups and they have the significant advantage of being locally based and community focused. The survey results suggest two major obstacles to active dissemination of the implications of ECPC for clinical practice: a lack of finances and a lack of credibility among providers, particularly physicians.

The latter is probably inevitable, but the lack of finances could be ameliorated. It is a particular problem for ECPC. None of the organizations has been able to purchase it in any form other than the paperback because of its high price, despite the desire by a number to have the two-volume set and/or the database. Given the extent of enthusiasm for ECPC within these types of organizations, and their capacity to disseminate the contents of ECPC directly to the public, financial support from the government or foundations would be an excellent investment in applying public pressure to providers. This is probably the single most worthwhile action that could be taken to exploit the largely untapped motivation of community groups.

In addition, some assistance from a resource center could facilitate the updating of the information and its translation into consumer bulletins, pamphlets, and video presentations, and could be a catalyst for periodic community-based and publicly oriented conferences. The national Institute of Child Health or the national Childbirth Education Association might be suitable candidates for such a central resource. Patients are increasingly receptive to such information as they assume a more active role in the physician–patient relationship, especially when they are able

to make their own preferences known in the large number of previously unacknowledged "toss-up" clinical situations (Wennberg 1990). Appendix 3 of ECPC ("Forms of Care with Unknown Effects Which Require Further Evaluation") and, to a lesser extent, Appendix 2 ("Forms of Care That Appear Promising but Require Further Evaluation") offer patients clinical situations in which their preferences should strongly influence the ultimate therapeutic decision.

The production of pamphlets suitable for physicians' offices might be one way to link the community groups with the physician organizations. A joint initiative between SOGC and a consumer group would meet the needs of pregnant mothers who want more information on their childbirth choices, as well as equipping physicians with ready-made ways of providing the information without it detracting from valuable office-visit time.

The provincial Childbirth Education Associations are involved in prenatal classes to a large extent. Because pregnant women and their spouses are their primary audience, they are in an excellent position to increase the awareness of ECPC's implications in an audience and at a time when motivation to apply pressure to providers is high. Assisted by their national parent body, provincial chapters could evaluate and review the current content of prenatal class curricula with the goal of increasing the role of ECPC in it.

The principal issue for the Vaginal Birth after Cesarean groups has been inordinately high cesarean section rates in their local hospitals. A major strength of these organizations is their intimate knowledge of the actual childbirth practices and procedures of particular local providers and hospitals. They are potentially powerful local enabling agents. However, a weakness is their inability independently to obtain and use population-based data, such as the computerized hospital discharge abstracts. Financial and epidemiologic assistance from a central community resource center might facilitate the collection of locally relevant data. Indeed, a recent task force on cesarean section in Ontario has compiled such hospital-specific data publicly for the first time (Ontario Ministry of Health 1991). With local data, a community group can then use ECPC to estimate whether the extant practice patterns comply with standards suggested by the research. Although this might not endear them to the physician organizations, it will greatly increase their credibility.

Finally, the extent to which they can exploit the media as an influence will grow as these local groups gain access to quantitative data. The gen-

eral policy environment has always been receptive to quantitative descriptions of problems rather than to "outbursts from community radicals" (Reuter 1986). The potential power of the media in a concerted campaign to alter inappropriate physician practices has recently been demonstrated in Switzerland, where high rates of hysterectomy were reduced by using a newspaper, radio, and television debating strategy (Domenighetti et al. 1988).

Administrator Organizations

Few administrative units other than hospitals can act as retailers of research information like ECPC. Local public health units play some role in pre- and postnatal care in the community, but would not perceive childbirth-related services as a major part of their mandate.

The provincial hospital associations historically have not viewed their mandate as including the transfer of evidence on the clinical effectiveness of care. Recently, however, the national hospital association and many of the provincial chapters have responded to the demands for more substantive quality assurance. As a first step, individual hospitals have been altering committee and reporting structures, improving data systems, and changing medical and other staff attitudes and expectations. Few hospitals have yet progressed beyond this initial step.

Exploiting these new attitudes and structures by making ECPC readily available to its members is one role for the hospital associations. With the encouragement of a product champion, the associations could act as predisposing agents by developing survey instruments and checklists based on ECPC. Local hospitals, acting as enabling agents, could use these tools to undertake institutional audits on their childbirth services. The audits could be used to encourage the physician and nursing staffs to undertake their own medical and nursing audits to complement the institutional process. Just by providing member hospitals with explicit, research-based review criteria, the hospital association will have gone part way toward breaking the self-perpetuating process of compliant peer reviewers using locally accepted practice as the implicit criterion of evaluation.

Hospitals would inevitably have to recognize that decisions about clinical care are still left to clinicians. Administrative rules affecting clinical practice would not fit with the existing distribution of authority. Local managers would, however, be empowered to question clinical

practices if, for instance, they had ready access to updated information like the ECPC database. Hospital access to a centralized electronic link could make the ECPC computerized database widely available through the provincial hospital association. Product champions inside the hospital association may generate other culturally acceptable ways of injecting ECPC into the practitioner's administrative environment.

Public Policy-maker Organizations

The federal government has no direct responsibility for the delivery of health care services in Canada other than financing. Provincial governments are responsible for public policy for health care delivery. In theory, these governments have extensive economic, regulatory, and administrative capacity to influence clinical decision making; in practice, this capacity is only exercised in consultation with the medical profession, usually through the medical associations (rather than the colleges or specialty groups). Obviously, this severely limits the provincial governments' role in actively carrying out the implications of clinically oriented documents like ECPC.

Rarely does clinical effectiveness information play any role in negotiation of fee schedules between medical associations and provincial governments (Lomas, Charles, and Greb 1992). Only on three occasions have fee differentials been used to encourage particular obstetric practices. In Ontario the medical association increased the fee for childbirth to encourage general practitioners to remain in obstetric care. In Alberta and Quebec the provincial governments and the medical associations provided a "bonus fee" for physicians undertaking a trial of labor for women with a previous cesarean section. There is little evidence that these differentials resulted in a major change in behavior (Planification-Evaluation Santé Services Sociaux 1990). Interestingly, a recent U.S. study has also played down the role of economic incentives in determining inappropriate obstetric care (Tussing and Wojtowycz 1992). Our survey revealed that medical consultants of the provincial health insurance plans are unaware of ECPC and, even when they know about it, see it playing little part in their claims assessment activities. Provincial governments cannot currently use the economic influence of their fee schedules unilaterally, especially given the dramatic alterations that would apparently be required for such fee differentials to be effective.

The two remaining roles for provincial governments are as catalyst and funding agent for task forces or other collaborative exercises, and as provider of data. In most provinces the ministry of health has appointed a specific coordinator for maternal and child health services. These are the obvious candidates for the public policy-maker product champions. Many have good links with community groups and could facilitate data acquisition. The provincial governments have encountered some resistance from medical associations when they have funded task forces on such issues as the appropriateness of cesarean section rates (Rich 1990); perhaps a more general task force on ECPC and childbirth practices would encounter less resistance.

Coordinating Implementation

An explicit forum for coordinating initiatives would enhance the synergistic impact of individual actions. An annual meeting of product champions could establish and maintain momentum, and coordinate progress, toward clinical childbirth services based largely on good quality research like ECPC. At the inaugural meeting the identified potential product champions would be educated about ECPC, oriented to their situation and that of others, and given a review of current information on effective ways to alter clinical practices. Then they would break into groups based on their type of organization (public policy maker, administrator, etc.) to formulate plans for action and collaboration across provinces. Finally, they would convene as one national and ten provincial groups, cutting across organization types, to strike geographic plans for a coordinated campaign to retail evidence-based medicine, complete with specified collaborative and independent actions.

Follow-up meetings would outline progress, modify collaborative and independent actions, and incorporate new research information. Establishing and maintaining the forum would both advance research-based clinical services for childbirth, and act as an example for other areas of clinical practice to follow.

The Wider Implications

Most of those involved in, or potentially able to influence, clinical care in Canada consider better and more proficient educational efforts to be

the key to improving the use of biomedical research. It is only beginning to be appreciated that these educational intrusions are just one of many influences competing to affect the clinical decisions of practitioners. Admittedly, we know only a small amount about what goes on inside the "black box" of the physician's practice environment. More research is needed. When has that not been the case? Nevertheless, we already know that the historical reliance on traditional "official" educational mechanisms is not adequate to the task of routinely transferring research into practice.

Many nonclinicians are surprised to discover how little formal effort goes into monitoring and ensuring adherence of practice to the available biomedical evidence. The emergence of ECPC and other syntheses is beginning to highlight the degree of divergence between actual and optimal practice. A first step in closing this gap is to gain general recognition of the size of the problem. A second step is to bring attention to the fact that all the stakeholders—not just practitioners and patients, but also administrators, public policy makers, and community groups—are legitimate agents in effecting change.

Despite their command over potentially powerful economic or regulatory routes of influence, Canadian policy makers and administrators currently defer on matters of clinical content to practitioners and their organizations. By contrast, "managed care" in the United States is a euphemism for significant intrusions by third parties upon the practice of medicine. The cost-containment motivation of these third parties is largely absent in Canada, where more global instruments such as capped overall budgets are available. Canadian third parties' consequently more demure attitude toward encroachment upon practitioners' authority has effectively placed more responsibility for ensuring evidence-based practice on the shoulders of clinicians and their organizations.

Clinical policy groups in Canada are gradually realizing that failure to exercise this responsibility may, in the long run, result in more active third-party intervention. In response, some are starting to take a leadership role; others, however, put their efforts into justifying the divergences from optimal practice uncovered by the application of syntheses like ECPC. If the threat of third-party intrusion were to become more real, most would probably adopt the leadership role. It will be some time before Canadian administrators and public policy makers are willing, or find it necessary, to apply the full pressure offered by ECPC and

other valid practice guidelines. In the interim we should explore the best ways to combine and exploit available routes of influence on clinical decision making. ECPC offers an excellent vehicle for this exploration.

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Address correspondence to: Jonathan Lomas, Coordinator, Centre for Health Economics and Policy Analysis, Health Sciences, Room 3H1D, McMaster University, Hamilton, Ontario, Canada, L8N 3Z5.